

Catalogue of chemical apparatus and pure chemicals sold by Townson & Mercer.

Contributors

Townson & Mercer (firm)

Publication/Creation

[London?] : [Townson & Mercer?], [1888]

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TOWNSON & MERCER'S
CATALOGUE
OF
CHEMICAL AND PHYSICAL
APPARATUS
AND
CHEMICALS.

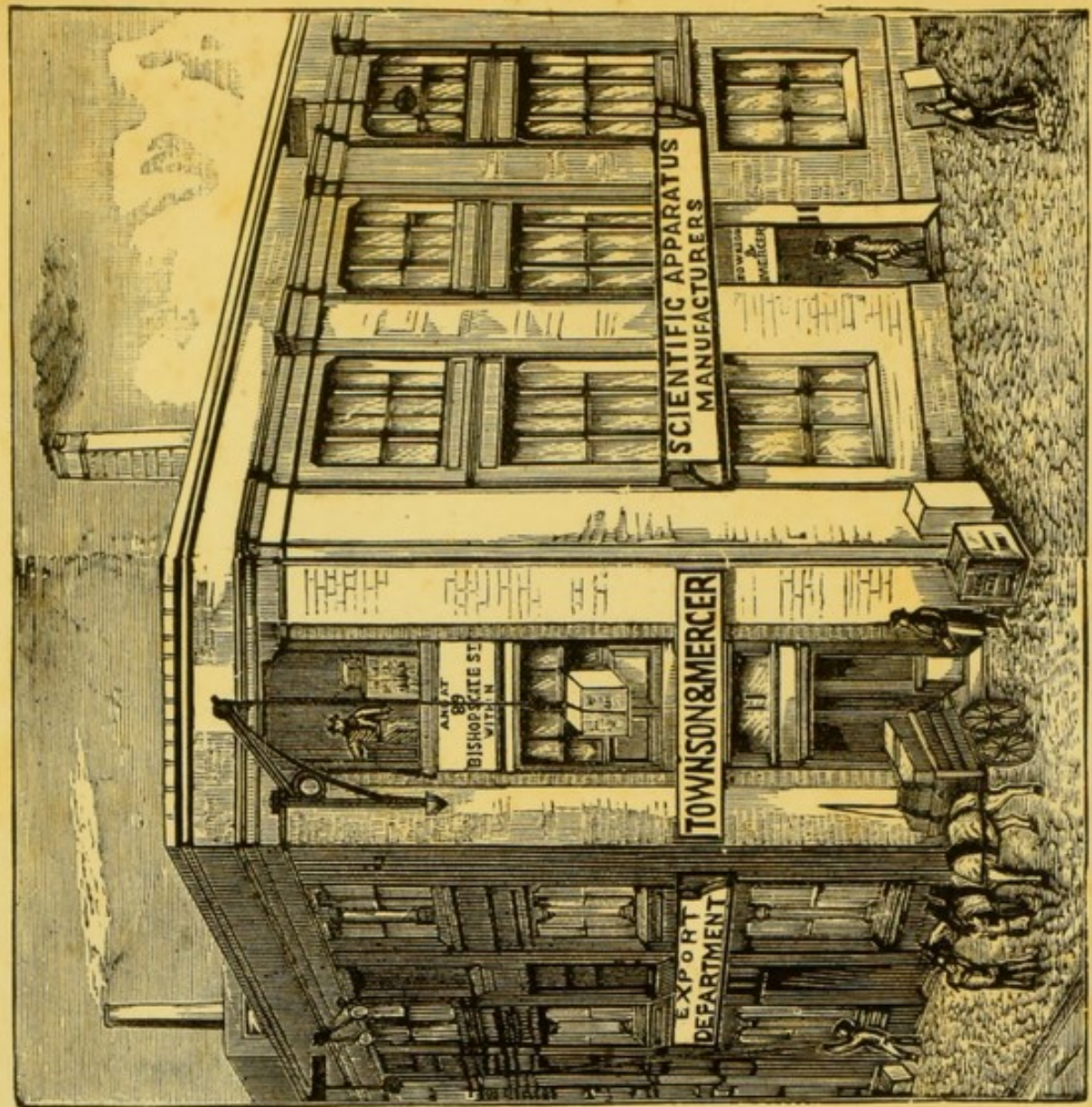
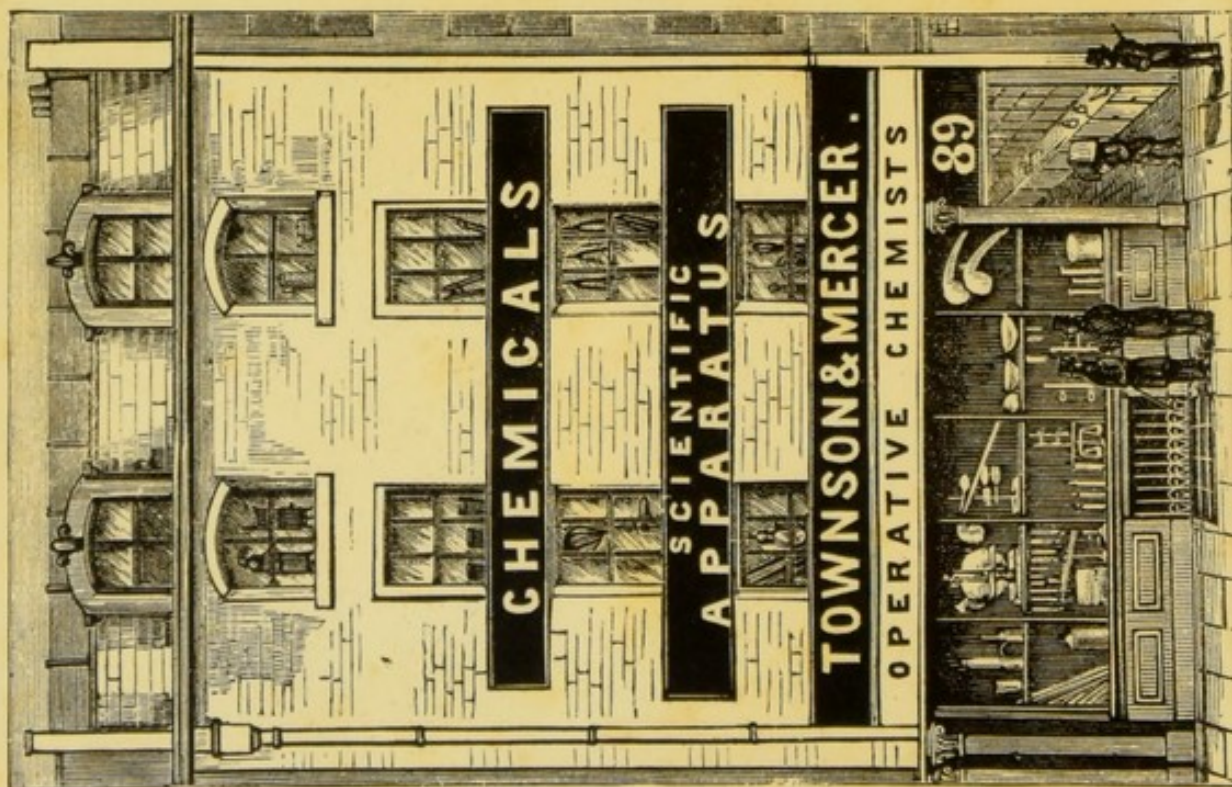
— ← —
AUGUST, 1888.

AHO AV



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TOWNSON & MERCER, Manufacturers of Chemical & Scientific Apparatus, & Pure Chemicals



ESTABLISHED A.D. 1798.

4th EDITION.]

CATALOGUE OF
CHEMICAL APPARATUS,
AND PURE CHEMICALS,

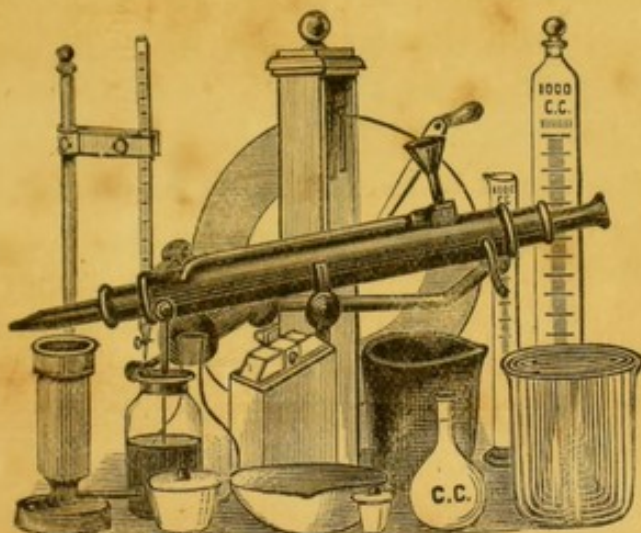
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TOWNSON & MERCER,

89, Bishopsgate Street Within, London, E.C.,

Wholesale and Export Dealers in

CHEMICAL AND SCIENTIFIC APPARATUS AND PURE CHEMICALS.



Makers of Apparatus, &c., for the Laboratories of
Her Majesty's Hon. Board of Inland Revenue
and Customs, Royal Mint, Royal Arsenal,
Royal Military Academy, Department Royal
Artillery Studies, Director General of
Stores for India, Privy Council Board
of Education, the Universities of
Oxford, Cambridge, London,
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PREFACE TO FOURTH EDITION.

In submitting our revised Catalogue of Chemical and Scientific Apparatus, Chemicals, &c., to our Patrons, we trust we have succeeded in making it as complete as possible as a reference for the known apparatus in use up to the present date, at the lowest prices consistent with adhering to our fixed principle of supplying the best articles.

Having the command of the best markets in Bohemia and Germany, together with the Sole Agencies in London for BECKER & SON'S (Rotterdam) Balances and Weights, HALDENWANGER'S Porcelain, SCHLEICHER & SCHULL'S Rhenish and MUNCKTELL'S Swedish Filter Papers, at the same time holding the largest stock in England, and having an experienced staff of Assistants and Packers, who have been many years in our employ, we are enabled to execute orders at the shortest notice.

We cannot refrain from calling attention to the so-called graduated instruments now in the market, which in many instances are simply marked with very little reference as to accuracy, and which are calculated to do a considerable amount of mischief. We have given this department our greatest attention, and feel confident we have succeeded in giving satisfaction to our Customers.

Chemical Thermometers vary considerably under certain conditions of depression or ascension, and in the cheaper description after being kept at 200° C. for some weeks will be found to be 10° to 12° C. or 25° F. higher than they should be. Professor WEBER, of Charlottenburg, has had this matter under consideration for some time, and in conjunction with Messrs. GREINER & FRIEDRICH, has arrived at the conclusion that one of the great causes is bad glass, and we have now the satisfaction of informing our Customers that this difficulty has to a considerable extent been overcome by Messrs. G. & F., and in future the Thermometers and Hydrometers will be made of this special glass.

In compiling the Catalogue we have been compelled to re-arrange the numbers, and to avoid mistakes in ordering, we have given both the Old and New Catalogue Numbers, at the same time we should advise that the name of the article as well as the number should be given on the order, particularly in foreign indents, where communication or omission would cause delay.

Several additions have been made in the Chemical and Physical Apparatus, we have also added a list of the Chemical and Physical Apparatus as recommended by the Science and Art Department, with the amount of aid allowed by the Department, and corresponding numbers in our Catalogue, which we trust will be an assistance in making selections.

The Export Department will, as hitherto, have our personal supervision, and the numerous testimonials we have received of the care with which the goods have been packed, is a source of satisfaction to us.

We do not hold ourselves responsible for breakages in transit, as every care is taken to ensure safe delivery of goods at their destination; in the event of breakage, intimation should be given at once to the Railway Company or Carrier, who are alone responsible.

We would wish to caution our Customers that there is a considerable risk in sending delicate articles such as Hydrometers, by Parcels Post or otherwise, in a small package, as the sudden jerk given, or want of care in handling about, is alone sufficient to break the article, however carefully packed. We should always recommend their being, if possible, sent or enclosed with other goods, in a large package.

TERMS, Cash or Reference in London. On receipt of an order according to this Catalogue, an invoice will be sent and the goods forwarded immediately a remittance by Cheque or Post Office Order is received.

Cheques to be crossed BARCLAY & Co., and Post Office Orders to be made payable at the Post Office, Gresham House, Bishopsgate Street, E.C.

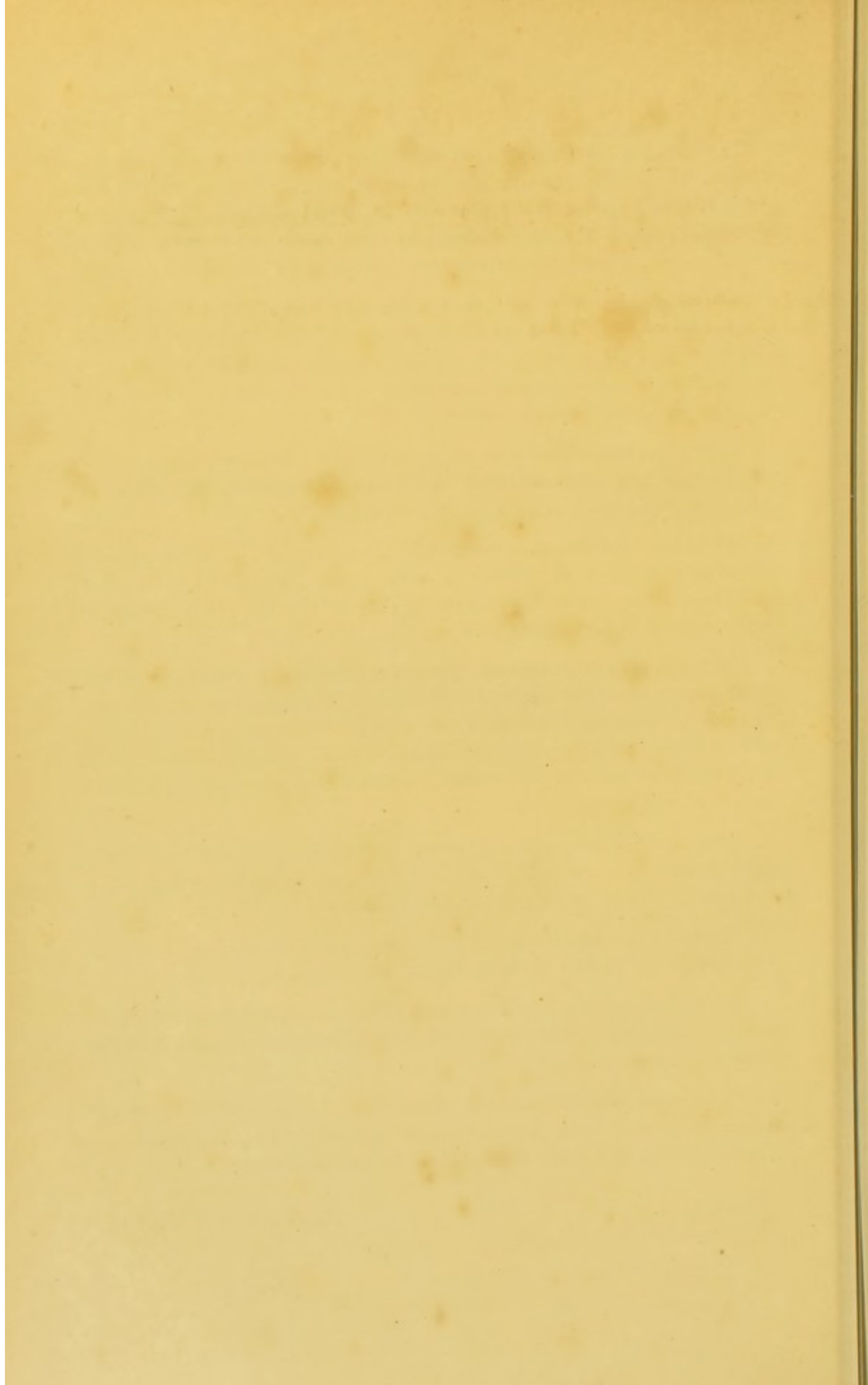
Foreign Orders must be accompanied by a remittance or instructions for payment in London, on delivery of the Bills of Lading, &c. Prices are subject to market fluctuations.

We again respectfully tender our best thanks to our patrons for their liberal support, and assure them that our utmost endeavours by personal supervision will be exercised, in order to secure their continued patronage.

August, 1888.

89, BISHOPSGATE STREET, WITHIN,
LONDON, E.C.

TOWNSON & MERCER.

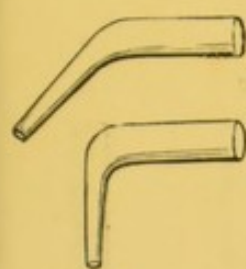


TOWNSON & MERCER'S

Price List

OF

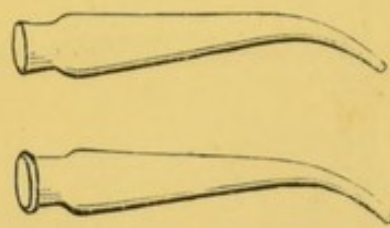
CHEMICAL APPARATUS, &c.



1



2



3

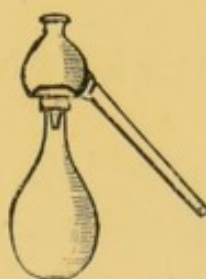
Adapters for connecting Retorts and Receivers.

Old
Cat.No.

1	1	Adapters, Small.	Internal diameter about $\frac{7}{8}$ -in., for Leibig's Condensers.				
			6d. each.				
2	2	„	Straight or with Bulb, internal diameter—				
			12 × 1	15 × 1½	20 × 1¾	25 × 2	25 × 2½ inches
			6d.	8d.	1/	1/3	1/6 each
3	3	„	Bent 8d.	10d.	1/3	1/6	1/9 „



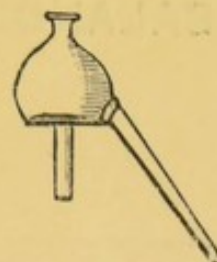
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5



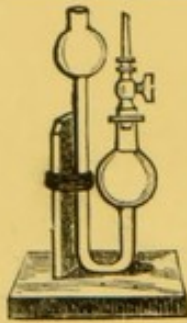
6



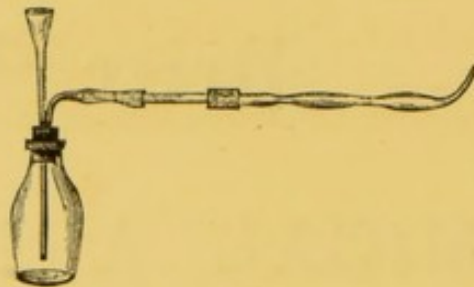
7

4	4	Alembics, Small, Blown Hard Glass.	Capacity 4 ozs., each		£0 0 10			
5	5	„ „ „	with Moveable Heads „ „		0 1 0			
6	6	„	Bohemian Hard Glass, Ground and Stoppered—					
			5	10	20	40	60	100 ounces capacity
			2/6	3/6	5/	6/	7/	8/6 each
7	7	„	Heads to fit Flasks up to 10 oz.		each	0 0 6	
8	8	Alembics, Heads for Bolt Heads	each	2/6 and	0 3 6		

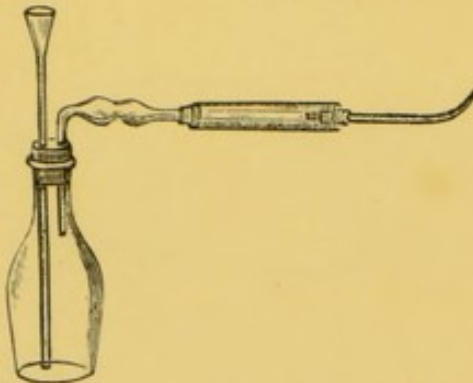
Alkalimeters. See Graduated Instruments.



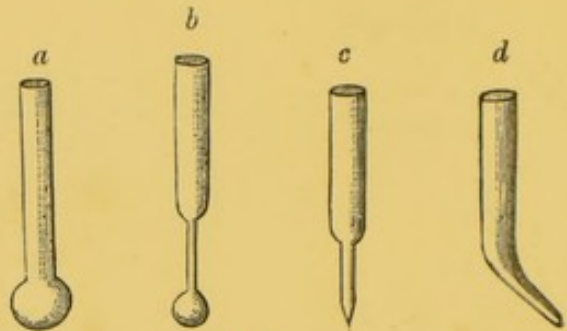
9



10A



10B

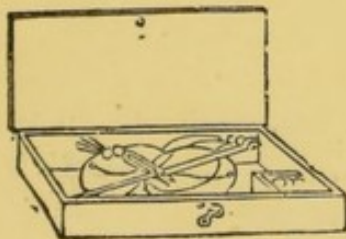


11

Old
Cat.No.

9	9	Arsenic Apparatus, Marsh's complete	...	...	each	£0	6	0
		" " with Platinum Jet	...	...	...	0	8	6
10	10	" Tube, only for ditto	...	...	...	0	0	9
10A	11	" Apparatus, Otto	...	...	...	0	2	6
10B	12	" " Berzelius	...	...	...	0	2	6
10c	13	" " Fresenius, similar to above	...	...	...	0	2	3
11	14	" Tubes (a) Clarke, (b) Berzelius, (c) Rose, (d) Liebig, either shape...	...	...	per doz.	0	0	10

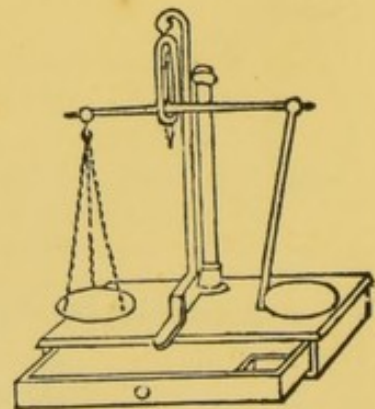
BALANCES AND SCALES AND WEIGHTS.



15



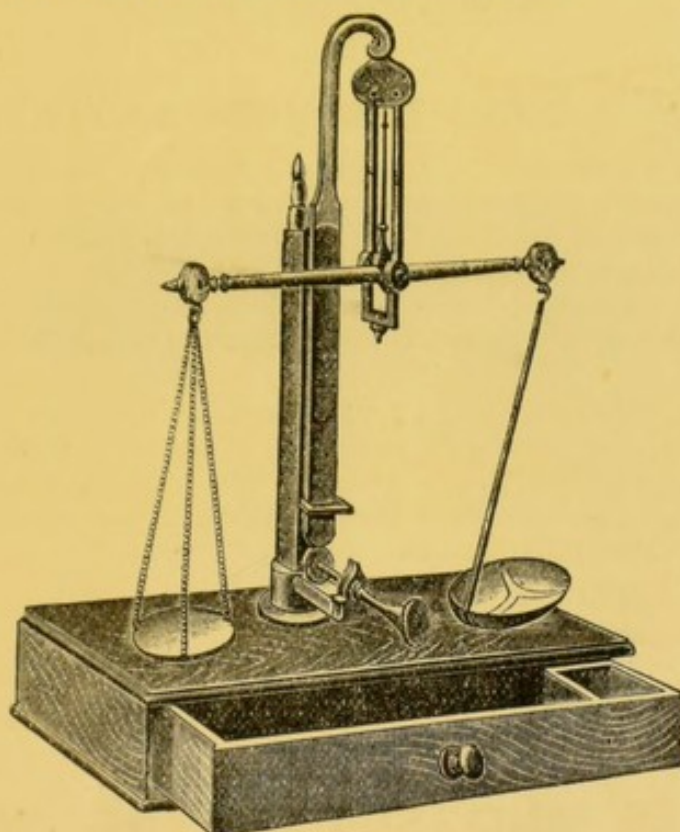
16



18

12	15	Balances, Apothecaries, Dispensing or for Rough Weighing with Weights. $\frac{1}{2}$ grain to 2 drams, in Oak Box.			
		Hook End Beams	... 6 in.	7 in.	
		Brass Pans	... 2/6	3/6 each	
		Glass Pans	... 3/6	4/6 ,,	

Old Cat.No.	12A 16	Balances, Brass Pans, 6 in. Hook End Beam, with Brass Pillar, on Oak Stand, with Drawer	£0 5 0
13 17	,,	Box End Beam, Steel, in Polished Mahogany Box— 6 in. 7 in. Brass Pans 8/6 9/ each Glass Pans 9/ 10/6 ,,	
14 18	,,	with Brass Pillar and Lever, on Polished Mahogany Stand, with Drawer and Weights, Brass Beam with Box Ends, 7 in., and moveable Glass Pan	1 7 0



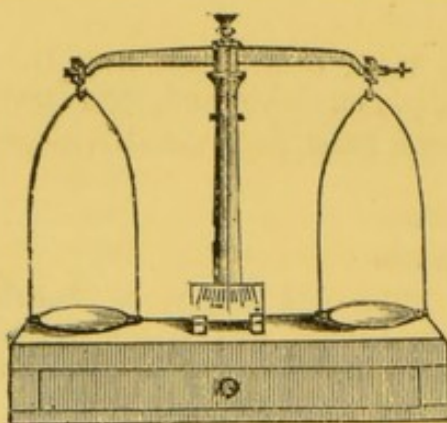
19

19 Balances, Improved Dispensing, with Patent Screw Lift, Brass Beam, Pillar, and Fittings, Glass Pans ; on Mahogany Box, with Drawer.

Beam 6 in., Box 8 in.	... ..	£1 2 6
,, 8 in. ,, 10 in.	... ..	1 6 6

This Scale has the advantage over the old pattern slide, as by the patent action of the new Thumb-Screw Lift, greater accuracy is insured in weighing. It avoids the unsteady action of the lever, and by raising the beam gradually, it remains suspended, thus freeing both hands for dispensing.

15 20	,,	Balances, Brass Pillar on Polished Mahogany Stand, with Drawer, Beam 10 in., Box Ends on Agates, to carry 1 lb. in each Pan... ..	2 2 0
16 21	,,	On French Polished Box, with Drawer, Drop Lever, Steel Knife Edges, Needle Pointer, Brass Beam 9 in., and Box moveable Pans, 2½ in., with Weights on Block in Drawer 300 grains to 1/10th, sensible to 1/50th grain (similar to fig. 23)	2 2 0
17 22	,,	Do. do., with weights 50 grammes to 1 centigramme, sensible to 1 milligramme	2 2 0



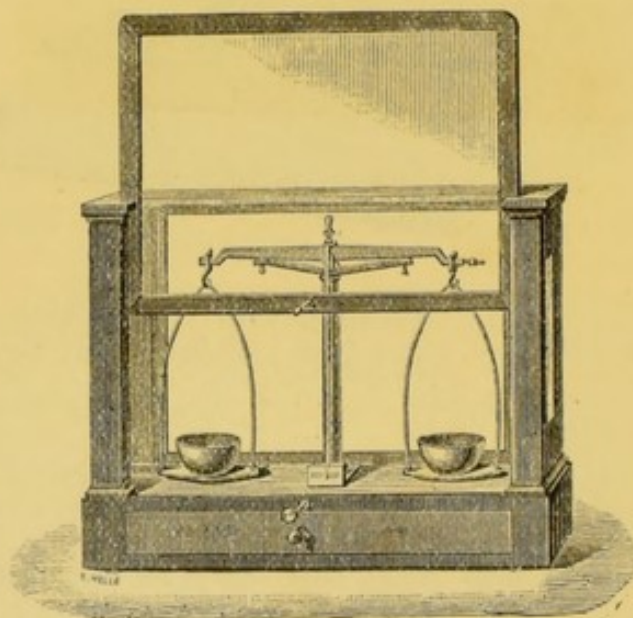
23

BECKER & SON'S BALANCES AND WEIGHTS.

The highest distinction, "Diplome d'Honneur," was awarded at the International Exhibition, Amsterdam, for accuracy and superiority of Workmanship. These Balances are in use in the Oxford, Cambridge, London, Tokio Universities, &c., &c., the College de Pharmacie du Museum d'Historie Naturelle, &c., &c., Paris, and the principal Universities, Colleges, and Scientific Laboratories in the United States of America, Canada, India, and Great Britain and Ireland.

Old
Cat.No.

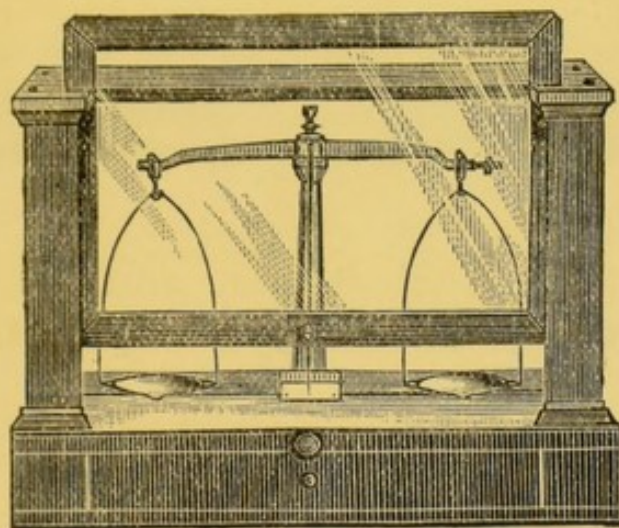
- 18 23 Balances, Becker's, No. 27, Prescription Scale on French Polished Box with Drawer, Drop Lever, Steel Knife Edges, and Needle Pointer, Brass Beam, Bows, and Moveable Pans, can be charged up to 50 grammes in each Pan, and sensible to 1 milligramme £1 11 8



24

- 19 24 Balances, Becker's, Student's Chemical, No. 69, in French Polished Mahogany Glass Case, with Counterpoised Front Sliding Frame, Drop Lever, Steel Knife Edges, and Needle Pointer, with Nickel Plated Pans, to carry 30 grammes in each Pan, and turn to half a milligramme 2 10 0

Old Cat.No.				
20	25	Balances, Becker's, Student's Chemical, No. 70, in Mahogany Case, Black Polished, Nickel Plated	£2	13 0
20A	26	„ Becker's, Beginners' Balance, No. 78, in French Polished Glass Case, similar to the above, but smaller, to carry 30 grammes in each Pan, sensible to 2 milligrammes	1	11 8
20B	27	„ Becker's, Pocket Balance, No. 73, to weigh up to 10 grammes, sensible to 2 milligrammes, with Weights, 5 grammes to 2 milligrammes	1	0 0
20c	28	„ Becker's, No. 75, to weigh up to 10 grammes, sensible to 2 milligrammes, on Mahogany Stand	0	12 6
20D	29	„ Becker's, Diamond Balance, No. 80, in French Polished Mahogany Box, and Drawer with Pillar, can be charged up to 64 carats in each Pan, sensible to $\frac{1}{64}$ carat, with set of Weights, 64 Carats down to $\frac{1}{64}$ Carat	1	2 6

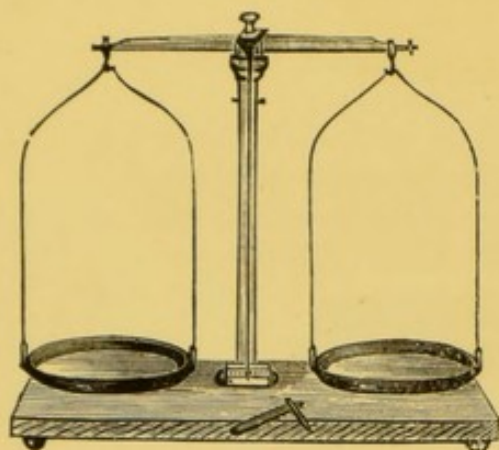


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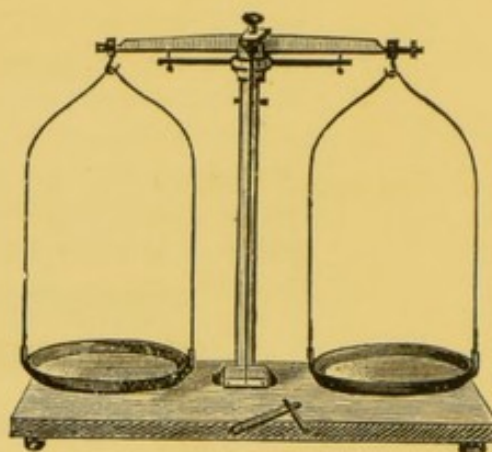
21	30	Balances, Becker's, No. 28, in French Polished Mahogany Glass Case, with Counterpoised Front Sliding Frame, Brass Pans, &c.; for a charge up to 50 grammes in each Pan, sensible to $\frac{1}{2}$ milligramme with its full charge	£2	16 8
21A	31	„ Becker's, No. 28, Beam divided at one end with Rider Apparatus and 2 Riders	3	11 8
22	32	„ Becker's, No. 29, ditto, ditto, provided with Set Screws and Level	3	10 0
22A	33	„ Becker's, No. 29, Beams divided at one end, with Rider Apparatus and 2 Riders	4	5 0
22B	34	„ Becker's, No. 31, in French Polished Mahogany Glass Case, &c., as No. 28, but larger for a charge up to 100 grammes in each Pan, sensible to 1 milligramme ...	3	10 0
22c	35	„ Becker's, No. 31A, ditto, ditto, provided with Set Screws and Level	4	0 0
22D	36	„ Becker's, No. 32, on Polished Mahogany Box with Drawer, to carry 250 grammes, sensible to 2 milligrammes ...	3	0 0
22E	37	„ Becker's, No. 33, ditto, in Polished Mahogany Glass Case with sliding frame, sensible to 1 milligramme ...	4	8 6

Old Cat.No.					
22F 38	Balances, Becker's, No. 85, ditto, provided with eccentric movement, to carry 500 grammes in each Pan, and sensible to 5 milligrammes	...	...	...	£5 16 8
22G 39	„ Becker's, No. 87, ditto, ditto, to carry 1½ kilogs. in each Pan, sensible to 10 milligrammes	...	...	...	8 0 0

For a more extended List of Bullion and other Balances, See Becker's Special List, to be obtained on application to Messrs. TOWNSON & MERCER.



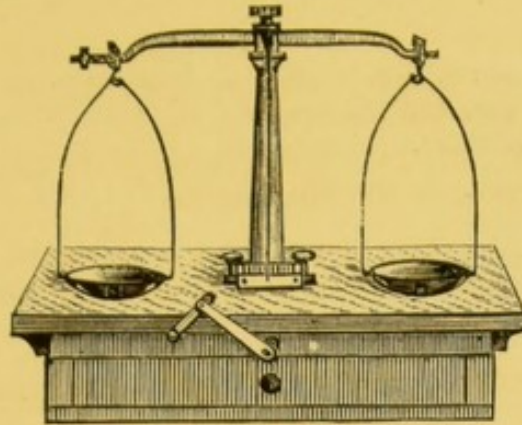
40



44

**For Apothecary, Gold, Silver, and other purposes
where Accuracy is required.**

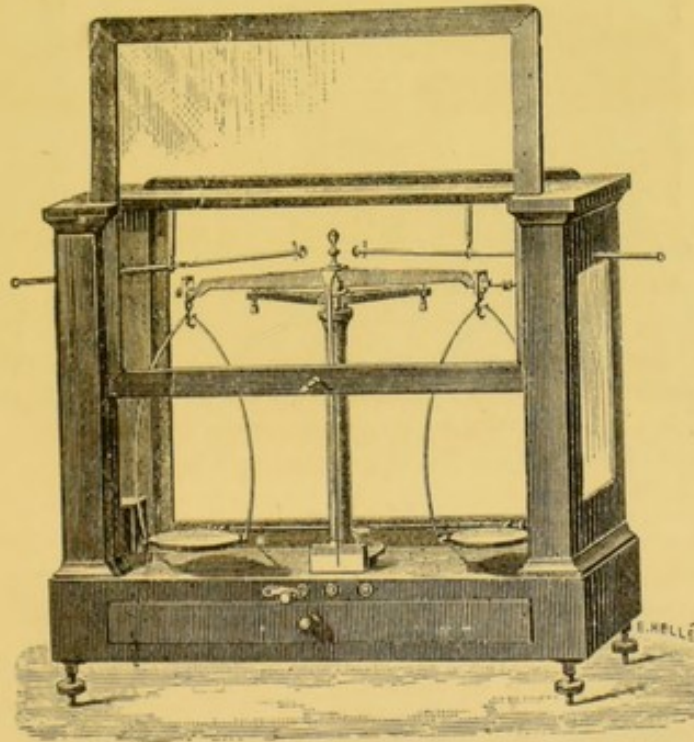
Old Cat.No.					
23 40	Balances, Becker's, No. 49, on a French Polished Board, for a charge up to 100 grammes in each Pan, sensible to 5 milligrammes, Pans 8 centimetres in diameter, Steel Knife Edges, and Needle Pointer, Brass Beam, Bows, and Moveable Pans	...	...	...	£1 10 0
24 41	„ Becker's, No. 50, on French Polished Board, for 250 grammes in each Pan, sensible to 10 milligrammes, Pans 10 centimetres in diameter	...	...	...	1 13 4
25 42	„ Becker's, No. 51, for 500 grammes, sensible to 15 milligrammes, Pans 12 centimetres in diameter	...	...	...	1 17 6
26 43	„ Becker's, No. 52, for 1,000 grammes, sensible to 20 milligrammes, Pans 15 centimetres in diameter	...	...	...	2 1 8
26A 44	„ Becker's, No. 65, on a French Polished Board, for a charge up to 100 grammes in each Pan, sensible to 5 milligrammes, provided with support for Beam, Drop Lever, Steel Knife Edges, and Needle Pointer, Brass Beam, Bows, and Moveable Pans, Pans 8 centimetres diameter	...	...	...	1 11 8
26B 45	„ Becker's, No. 66, same as above, for 250 grammes, sensible to 10 milligrammes, Pans 10 centimetres diameter	...	...	...	1 15 0
26c 46	„ Becker's, No. 67, for 500 grammes, sensible to 15 milligrammes, Pans 12 centimetres diameter	...	...	...	2 1 0
26D 47	„ Becker's, No. 68, for 1,000 grammes, sensible to 20 milligrammes, Pans 15 centimetres diameter	...	...	...	2 5 0



48

Old
Cat.No.

27 48 Balances, Becker's, No. 58, on a French Polished Box, with
Drawer, and Marble Top, for a charge up to 500
grammes in each Pan, sensible to 15 milligrammes,
Pans 15 centimetres in diameter £2 6 8



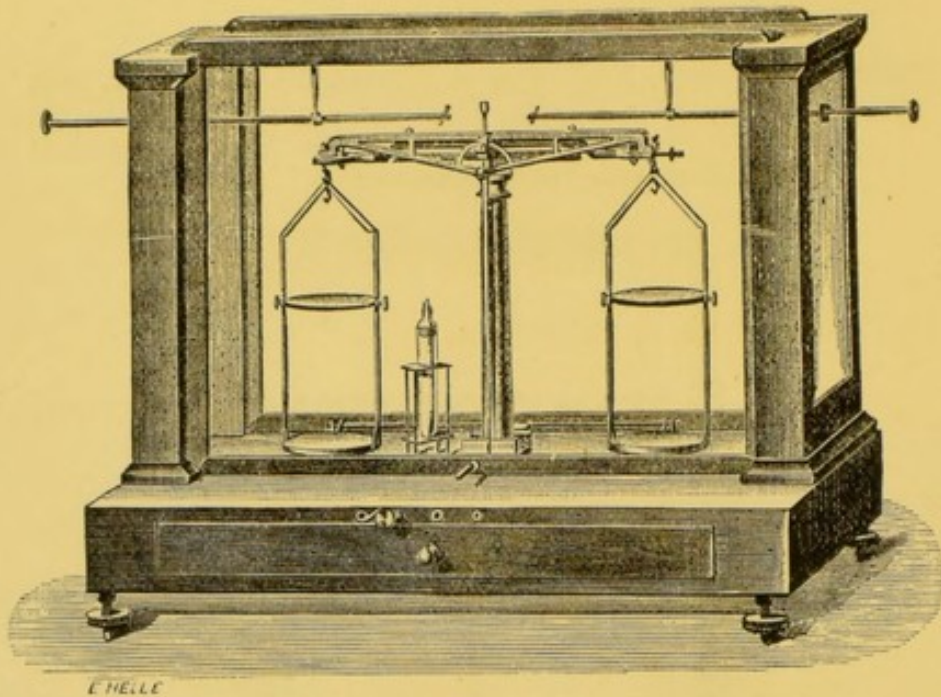
49

28 49 Balances, Becker's, No. 6, Analytical, for a charge up to 50
grammes in each Pan, in French Polished Glass Case,
Front Sliding Frame Counterpoised, Beam divided on
both sides to $\frac{1}{2}$ part of milligramme, with new improved
arrangement for arrest of Pans. Provided with Wood
Stand for taking Specific Gravity, Agate Bearings, and
sensible to $\frac{1}{3}$ th part of a milligramme with its full
charge, Pans 6 centimetres in diameter. Pans and
Bows Nickel Plated, provided with two Rider Apparatus £7 1 8

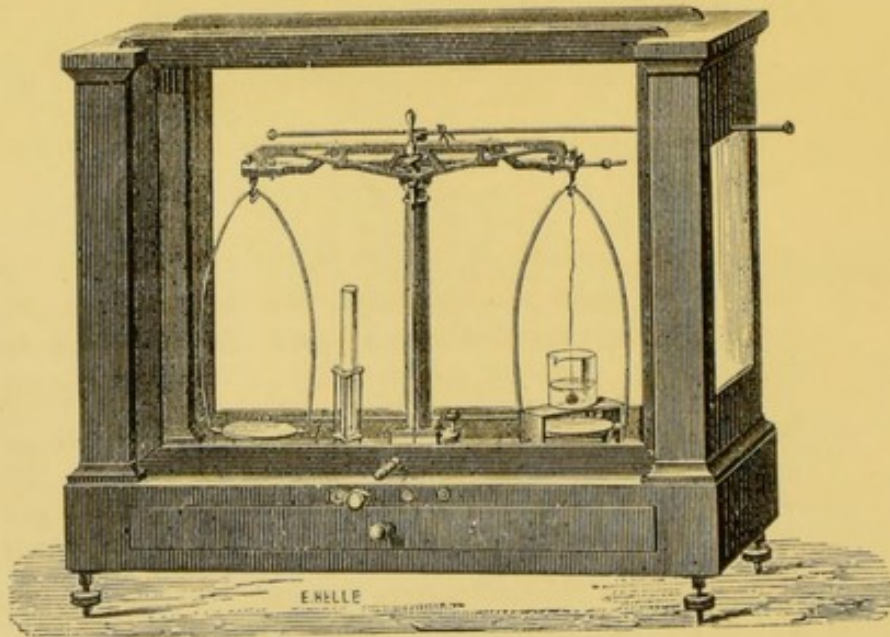
29 50 ,, Becker's, No. 8, for 50 grammes, with one Rider Apparatus,
but without new improved arrangement for arrest of
Pans. Brass Pans 5 15 0

Old
Cat.No.

30	51	Balances, Becker's, No. 9, for 50 grammes, without Rider Apparatus, and without new improved arrangement for arrest of Pans. Brass Pans	£5 0 0
31	52	„ Becker's, No. 10, the same as No. 28, for a charge up to 100 grammes in each Pan. Sensible to $\frac{1}{3}$ th part of a milligramme with its full charge, Pans $7\frac{1}{2}$ centimetres in diameter. Pans and Bows Nickel Plated, provided with two Rider Apparatus	8 6 8
32	53	„ Becker's, No. 11, for 100 grammes, with one Rider Apparatus, ditto, ditto	7 15 0



54, Fig. 4.

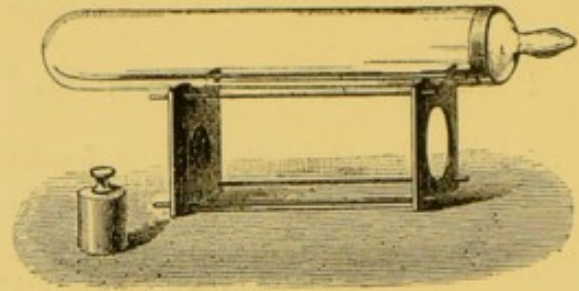
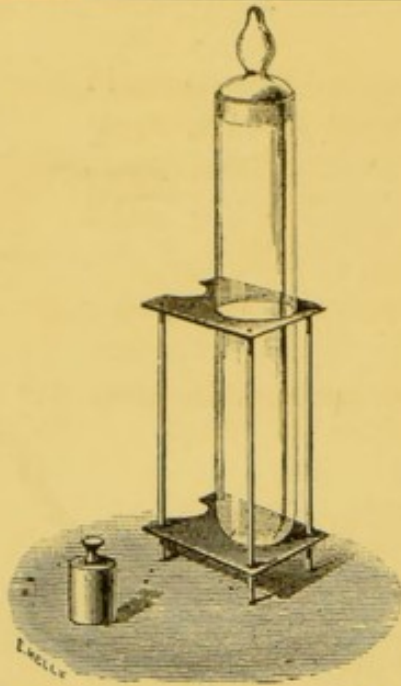


54, Fig. 5.

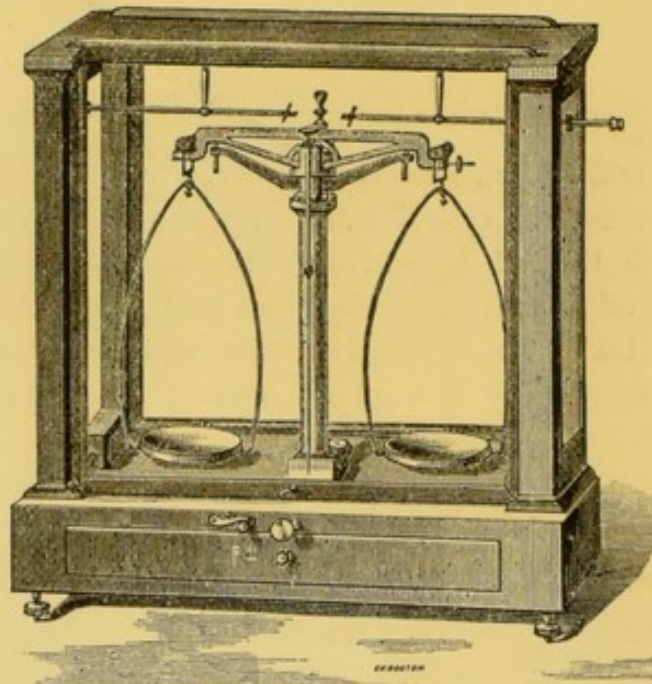
Old
Cat.No.

33	54	Balances, Becker's, No. 17, for a charge up to 100 grammes in each Pan, in fine French Polished Glass Case, Front Sliding Frame Counterpoised. All Bearings Agate Planes, with new improved arrangement for arrest of Pans and Beam, sensible to $\frac{1}{10}$ th milligramme with its full charge. Provided with Apparatus for Specific Gravity, Rider and Weighing Tubes. Beam divided into $\frac{1}{2}$ parts of milligramme, Pans $7\frac{1}{2}$ centimetres in diameter	£13	11	8
34	55	„ Becker's, No. 18, with Agate Knives	14	11	8
35	56	„ Becker's, No. 19, for 200 grammes in each Pan, sensible to $\frac{1}{10}$ th milligramme with its full charge, provided with improved arrangement for arrest of Pans, Apparatus for Specific Gravity, Rider and Weighing Tubes. Beam divided into $\frac{1}{10}$ th milligramme	16	6	8
36	57	„ Becker's, No. 20, with Agate Knives	17	6	8
36A	58	„ Becker's, No. 21, with adjustable Shelf for Specific Gravity	18	1	8
36B	59	„ Becker's, No. 22, for scientific use, for a charge up to 500 grammes in each Pan, sensible to $\frac{1}{10}$ th milligramme with its full charge. All Bearings Agate Planes, provided with Arrest for Pans and Beam, Apparatus for taking Specific Gravity, Rider and Weighing Tubes. Beam divided in $\frac{1}{10}$ th milligramme, Pans $10\frac{1}{2}$ centimetres in diameter	20	16	8
36c	60	„ Becker's, No. 23, ditto, ditto, with Agate Knives ...	21	13	4
36D	61	„ Becker's, No. 24, ditto, ditto, with adjustable Shelf for supporting Beaker with water when taking Specific Gravities	22	10	0
36E	62	„ Becker's, No. 25, for a charge up to 1,000 grammes, sensible to $\frac{1}{10}$ th milligramme with its full charge. Agate Knives, provided with Arrest for Pans, adjustable Shelf for Specific Gravity, Rider, &c. Beam divided in $\frac{1}{10}$ th milligramme, Pans 15 centimetres diameter ...	30	16	8
36F	63	„ Ditto, ditto, in Glass Case, for a charge up to 10 kilogrammes, sensible to 1 milligramme, with its full charge. Pans 24 centimetres diameter	66	13	4

In ordering the above Balances, please say whether Fig. 4 or Fig. 5 is required.



Weighing Tubes and Stands, included in Nos. 54, 55, 56, & 57 £0 4 2



64. Fig. 3A

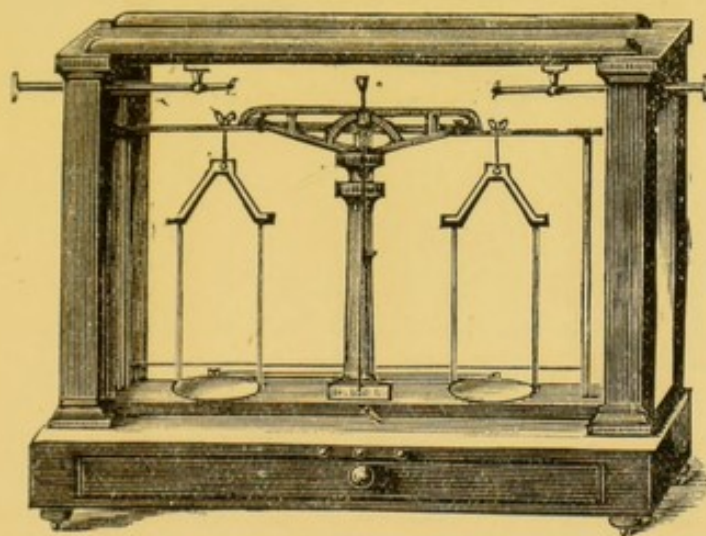
Old
Cat.No.

1578	64	Balances, Becker's, No. 10A, Short Beam, for a charge up to 100 grammes in each Pan, in French Polished Glass Case, Front Sliding Frame Counterpoised, Beam divided on both sides in $\frac{1}{3}$ th part of milligrammes, with new improved arrangement for arrest of Pans. Provided with Wood Stand for taking Specific Gravity, Agate Bearings, and sensible to $\frac{1}{10}$ th part of a milligramme, Pans $7\frac{1}{2}$ centimetres in diameter. Pans and Bows Nickel, provided with two Rider Apparatus	£8 15 0
1579	65	„ No. 11A, do., for 100 grammes, with one Rider Apparatus	8 3 4
1580	66	„ No. 12A, do., for 100 grammes, with one Rider Apparatus, but without new improved arrangement for arrest of Pans	7 10 0

Old
Cat.No.

1581	67	Balances, Becker's, No. 13A, for a charge up to 100 grammes, with one Rider Apparatus, and without new improved arrangement for arrest of Pans	£6	10	0
1582	68	„ No. 14A, ditto, the same as No. 10A, for a charge up to 200 grammes in each Pan. Sensible to $\frac{1}{3}$ th part of a milligramme with its full charge, one Rider Apparatus	10	0	0
1583	69	„ No. 15A, ditto, for a charge up to 500 grammes in each Pan, sensible to 1 milligramme with its full charge ...	12	10	0
1584	70	„ No. 16A, ditto, for a charge up to 1,000 grammes in each Pan, sensible to 2 milligrammes with its full charge ...	16	13	4

All these Balances can be supplied with Agate Knife Edges at the extra charge of 1 0 0



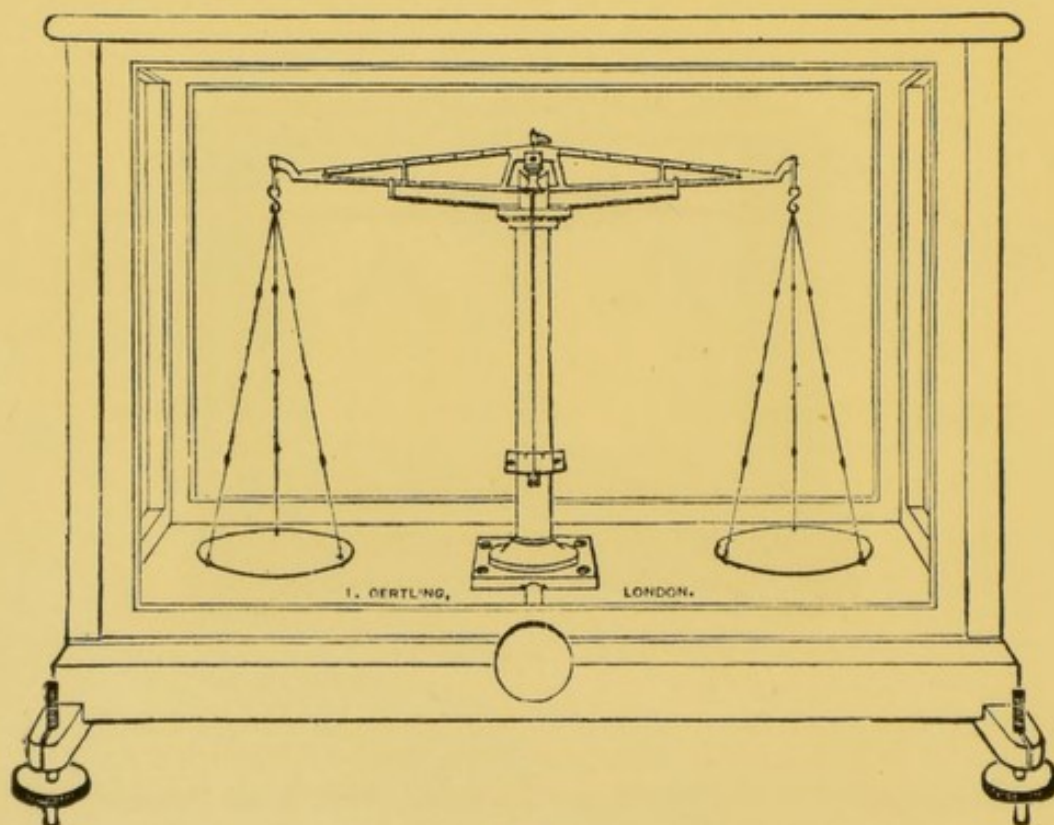
71. Fig. 3B

1585	71	Balances, Becker's, No. 82, new improved Short Beam Balance in French Polished Mahogany Glass Case, Front Sliding Frame counterpoised for a charge up to 2,000 grains in each Pan, sensible to $\frac{1}{500}$ th grain, or 125 grammes, and sensible to $\frac{1}{10}$ th milligramme, with new improved arrangement for arrest of Pans and Beam, running on Agate Planes, Double Rider Apparatus, provided with Apparatus for taking Specific Gravity, Nickel Pans 3 in. in diameter	£11	10	0
1586	72	„ The same with Agate Knife Edges	12	10	0

Old
Cat No.

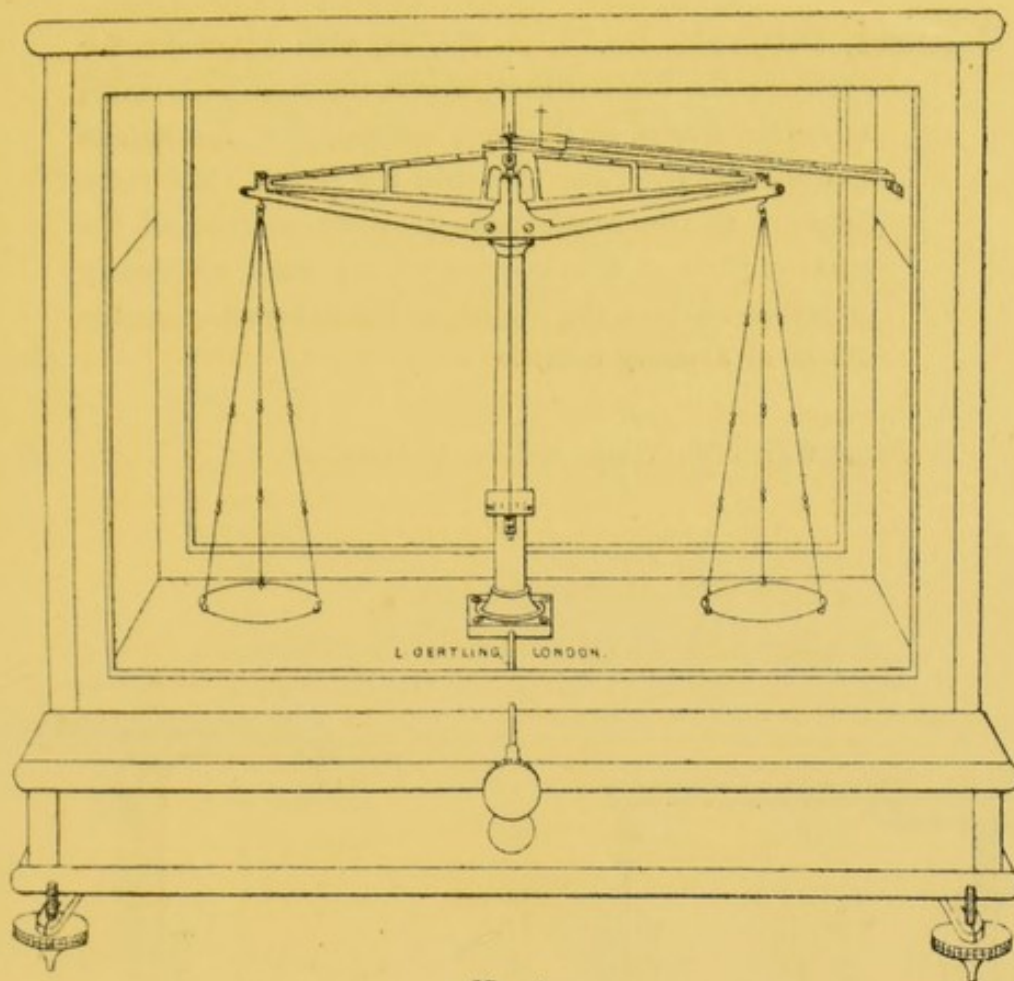
1587	73	Balances, No. 83, Becker's, new improved Short Beam Balance in French Polished Mahogany Glass Case, Front Sliding Frame counterpoised, for a charge up to 1 lb. in each Pan, sensible to $\frac{1}{200}$ th grain, or 350 grammes and sensible to $\frac{1}{3}$ th milligramme, Nickel Pans $3\frac{1}{2}$ in. in diameter	£13 10 0
	74	„ The same with Agate Knife Edges	14 10 0
1588	75	„ No. 84, ditto, ditto, for a charge up to 2 lb. in each Pan, sensible to $\frac{1}{500}$ th grain, or 750 grammes and sensible to $\frac{1}{10}$ th milligramme, Nickel Pans 4 in. in diameter ...	15 10 0
	76	„ The same with Agate Knife Edges	16 10 0
1589	77	„ No. 85, ditto, ditto, for a charge up to 3 lb. in each Pan, sensible to $\frac{1}{1000}$ th grain, or 1,200 grammes and sensible to $\frac{1}{2}$ milligramme, Nickel Pans 6 in. in diameter ...	17 16 8
	78	„ The same with Agate Knife Edges	18 16 8

All these Balances with one Rider Apparatus 10s. less.



79

37	79	Balances, Oertling's, No. 1, in Glass Case, Beam 8 in., to carry 300 grains in each Pan, and turn to $\frac{1}{50}$ th grain ...	£4 0 0
38	80	„ Oertling's, No. 2, in Glass Case, Beam 12 in. with Adjusting Screws, to carry 800 grains, and turn to $\frac{1}{50}$ th grain ...	6 6 0
39	81	„ Oertling's, in Glass Case, Beam 12 in., do., do., to carry 1,500 grains and turn to $\frac{1}{100}$ th grain, with Steadying Apparatus	7 10 0



No. 3

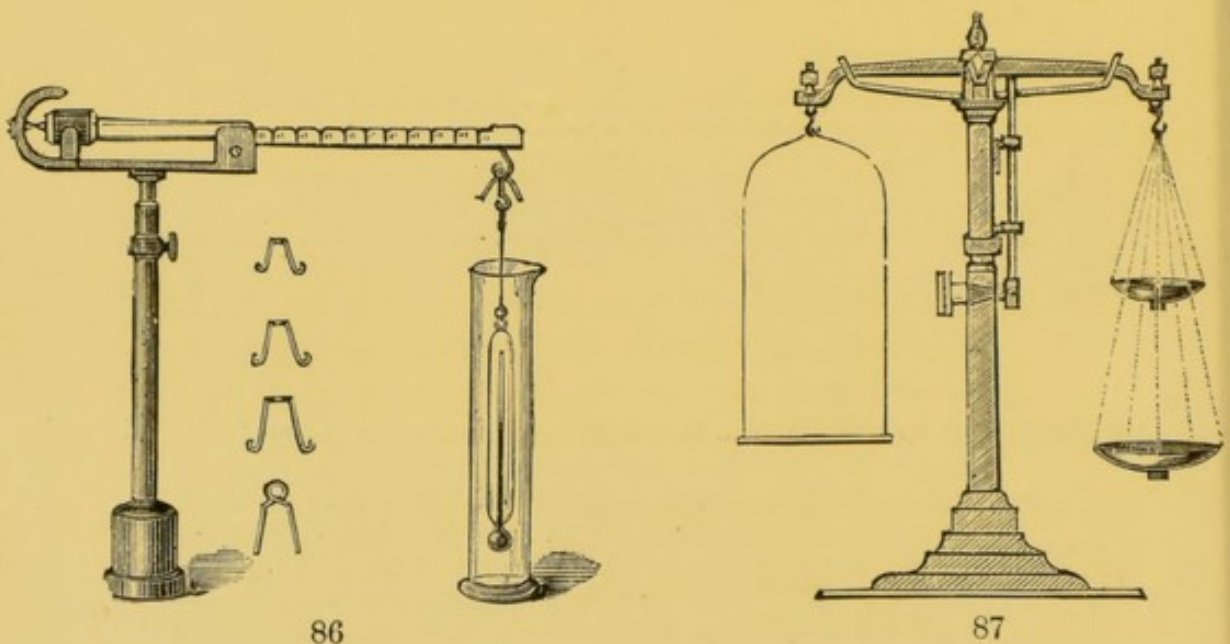
Old
Cat.No.

- | | | | |
|----|----|--|---------|
| 40 | 82 | Balances, Oertling's, No. 3, with 12-in. Beam, to carry 1,000 grains in each Pan, and turn distinctly with $\frac{1}{1000}$ th of a grain. The Beam is divided. Apparatus fixed in Case for moving the Sliding Weight, Short Pan for taking Specific Gravities, Glass Case with Adjusting Screws. The Beam of this Balance is constructed with Straight Knife Edges at the ends upon which the Pans are suspended by Agate Planes | £8 10 0 |
| 41 | 83 | ,, Oertling's, No. 3A, Do., Do., with Beam, fitted with Agate Edges and Planes. No Steel used in construction. Front of Glass Case Sliding, with Counterpoise Weights | 10 10 0 |
| | | Same with Stops for Pans extra | 1 1 0 |
| 42 | 84 | ,, Oertling's, No. 4, with 14-in. Beam, to carry 1,500 grains in each Pan, and indicate when loaded $\frac{1}{1000}$ th of a grain. The Beam is constructed with Knife Edges at the ends, upon which the Pans are suspended by Agate Planes. The centre also works upon a Single Agate Plane. The Beam is divided. Apparatus for moving the Sliding Weight. Pan for taking Specific Gravities. Glass Case with Adjusting Screws | 15 0 0 |

Old
Cat.No.

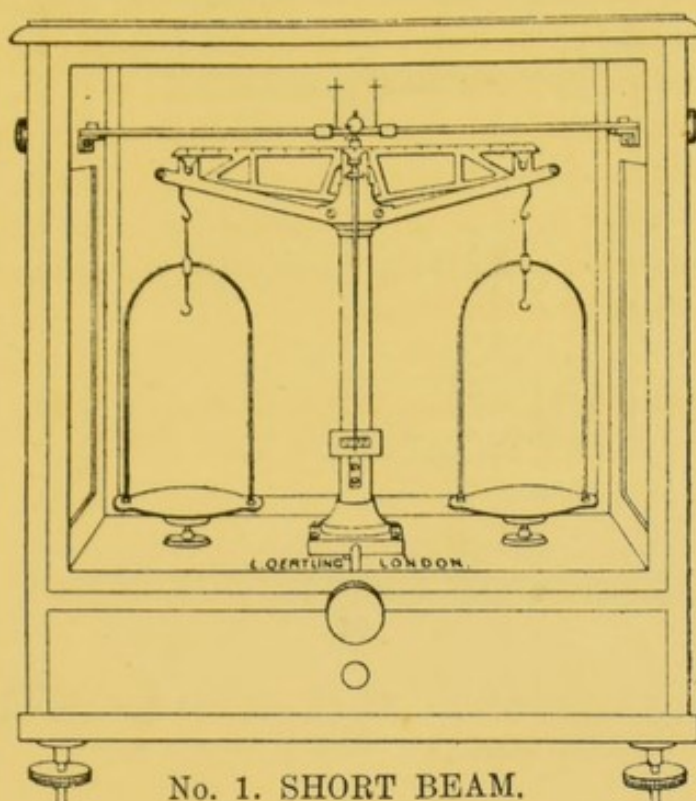
43 85 **Balances**, Oertling's, No. 5, as No. 84, with Apparatus for steadying the Pans connected with the same Axis which moves the Beam, so that one movement of the handle first releases the Pans and then the Beam. The three Edges of the Beam are made of Agate, so that all the working parts of the instrument are most effectually protected against the fumes of the laboratory, or the effects of a damp climate £18 18 0

Same with Plate Glass Bottom to Case 21 0 0



43A 86 **Balances**, Oertling's, for taking the Specific Gravity of small quantities of liquids. Balance Riders, Plummet, with Thermometer and Forceps, fitted in Polished Mahogany Box £3 3 0

87 ,, **Townson & Mercer's**, Brass, for Physical Experiments and Lecture, on Polished Brass Pillar, to carry 2 lb. in each Pan, and sensible to 10 milligrammes, with Pan for Specific Gravity. Height of Pillar 21 in., diameter of Pans 5 in., length of Beam 16 in. 2 10 0

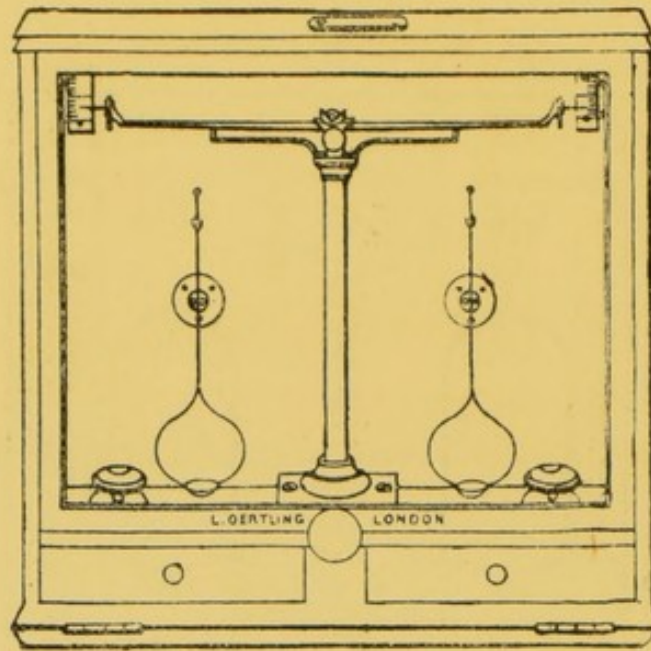


No. 1. SHORT BEAM.

88

Old
Cat.No.

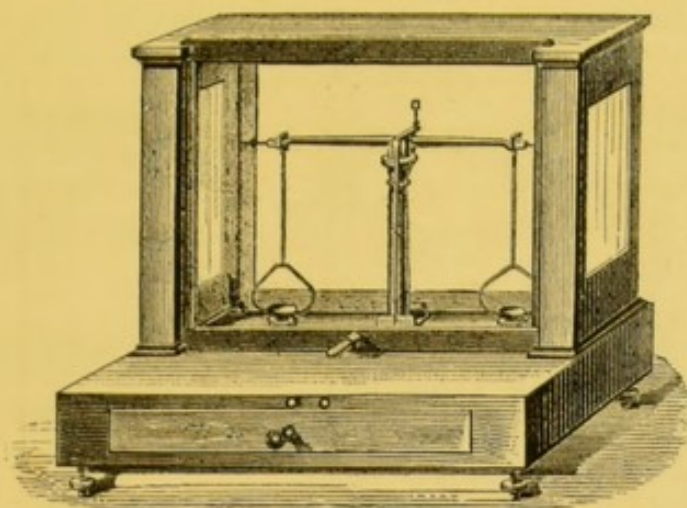
43B	88	Balances, Oertling's, with 8-in. Beam, Agate Knife Edges, to carry 1,500 grains in each pan and turn with $\frac{1}{500}$ th grain; fitted with Double Rider-Slide, front of Glass Case with Counterpoise Weights	...	...	...	£12 12 0
	89	„ as above, with Pan Supports	...	...	...	13 13 0
43c	90	„ Oertling's, Short Beam, No. 2, with 6-in. Oval Beam, Agate Knife Edges, Rider Slide, Plate Glass Bottom to Case, Front of Case with Counterpoise Weights, to carry 2,000 grains, and turn with $\frac{1}{500}$ th grain, or to carry 1 lb., and turn with $\frac{1}{200}$ th grain	...	...	...	16 10 0
	91	„ Ditto, Balance as above, fitted with Pan supports	...	...	...	17 17 0
43D	92	„ Oertling's, Short Beam, No. 3, with $6\frac{1}{2}$ in. Triangular Beam, Agate Knife Edges, to carry 2 lb. in each Pan, and turn with $\frac{1}{500}$ th grain, with Rider Slide, in Glass Case with Drawers, without Pan supports	...	...	...	17 17 0
	93	„ Ditto, ditto, with Pan supports	...	...	...	18 18 0
	94	„ Ditto, ditto, ditto and Plate Glass Bottom to Case	...	...	...	21 0 0



95

Old
Cat.No.

44	95	Balances, Assay, Oertling's, No. 10, in Glass Case, Beam 8 in., to carry 50 grains, and turn to $\frac{1}{2000}$ th	£5 15 0
45	96	„ Assay, Oertling's, No. 8, Do., with adjusting Screws, to carry 500 grains, and turn to $\frac{1}{10000}$ th	12 12 0
45A	97	„ Assay, Oertling's, No. 11, with 8-in. Beam, to carry 30 grains in each Pan, and turn to $\frac{1}{10000}$ th grain, Beam divided, and Apparatus fixed for moving Sliding Weights	15 0 0
45B	98	„ Assay, Oertling's, with a Beam 10 in. long, of an improved construction, on a Stand with Double Columns, to carry 30 grains in each Pan, and turn with $\frac{1}{10000}$ th grain, the Beam divided, and Apparatus fixed for moving Sliding Weights, Plate Glass for the bottom of the Case	25 0 0
45c	99	„ Assay, Oertling's, with a Beam 10 in., of an improved construction, to carry 30 grains in each Pan, and turn with $\frac{1}{10000}$ th grain, Beam divided, Agate Edges working on Agate Planes, Apparatus for the use of Sliding Weights, Plate Glass for Bottom of Case	30 0 0
45D	100	„ Oertling's, Portable Assay, in Glass Case, to carry 30 grains in each Pan, and turn to $\frac{1}{2000}$ th grain, outside dimensions of Case 8 in. square by 2 in. deep... ..	7 10 0



101

BECKER'S ASSAY BALANCES.Old
Cat.No.

46	101	Balances, Becker's, No. 1, Assay Balance, in French Polished Glass Case, Sliding Frame Counterpoised. Can be charged up to 25 grammes in each Pan. Deviation of Needle on scale 5 divisions for 1 milligramme. Steel Knives with Agate Bearings	£7 10 0
47	102	„ Becker's, No. 2, ditto, ditto, in French Polished Glass Case, with Counterpoised Sliding Frame. When loaded up to 1 gramme in each Pan the Needle deviates 10 divisions on the scale for 1 milligramme; $\frac{1}{100}$ th part of a milligramme is therefore registered. Steel Knives with Agate Bearings	9 3 4
48	103	„ Becker's No. 3, ditto, ditto, ditto, for up to 10 grammes in each Pan	10 0 0
49	104	„ Becker's, No. 4, ditto, ditto, with Apparatus for Rider, Beam divided in $\frac{1}{10}$ th part of milligramme	11 5 0
50	105	„ Becker's, No. 5, ditto, ditto, in French Polished Glass Case, Sliding Frame Counterpoised. All Bearings Agate Planes, with new improved arrangement for arrest of Pans and Beam. Loaded with 10 grammes the Needle deviates 10 divisions for 1 milligramme ...	13 1 8
50A	106	„ Becker's, No. 5A, in French Polished Glass Case, &c., &c., for a charge up to 10 grammes in each Pan. All Bearings Agate Planes, with new improved arrangement for arrest of Pans, combined with the Beam. Division on the Needle on scale 30 divisions for 1 milligramme. Beam divided on both sides into $\frac{1}{10}$ th part of milligramme	16 10 0
50B	107	„ Becker's, No. 5B, ditto, ditto, with Agate Knives ...	17 10 0

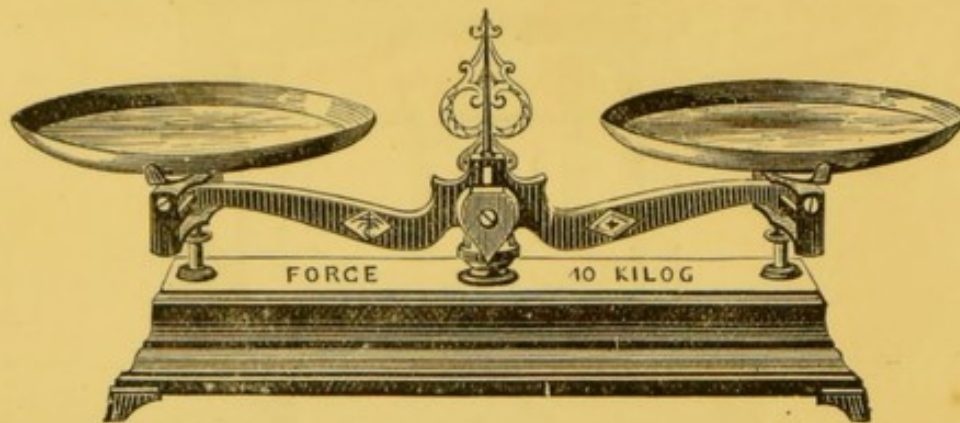


Fig. 1

DRUGGISTS' ROBERVAHL SCALES.

108 On Iron Box, with Moveable Brass Pans—

Diam. of pans	5	6	8	9	10	11	12 in.
Capacity ...	1	2	5	10	15	25	30 kilos.
Price ...	7/4	8/4	9/8	11/8	15/	21/3	24/7

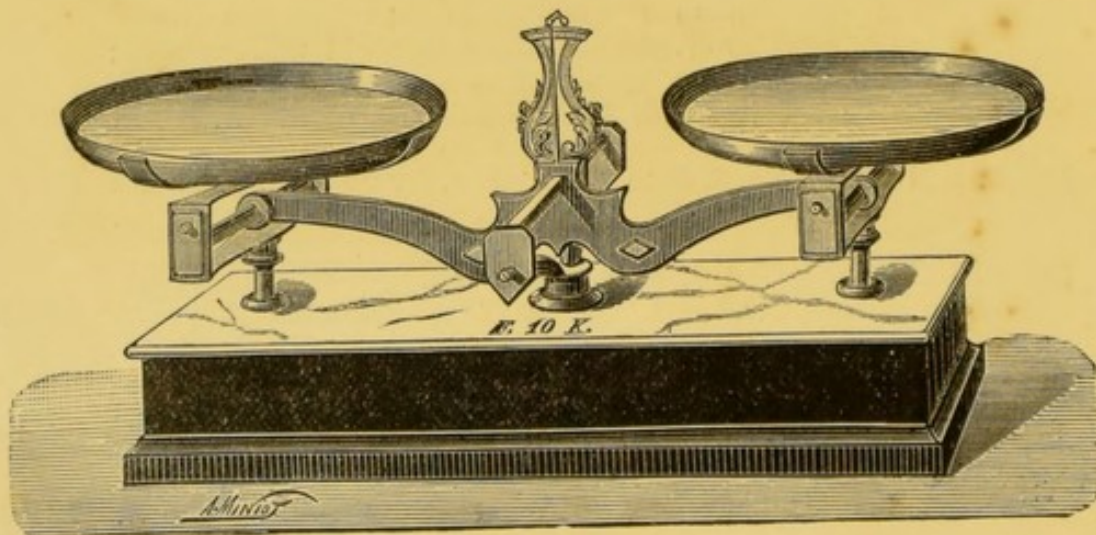


Fig. 2

109 On Polished Black Wood Box with Marble Top, moveable Brass Pans—

Diam. of pans	5	6	8	9	10	11	12 in.
Capacity ...	1	2	5	10	15	25	30 kilos.
Price ...	15/	16/8	18/4	21/8	25/	38/4	48/4

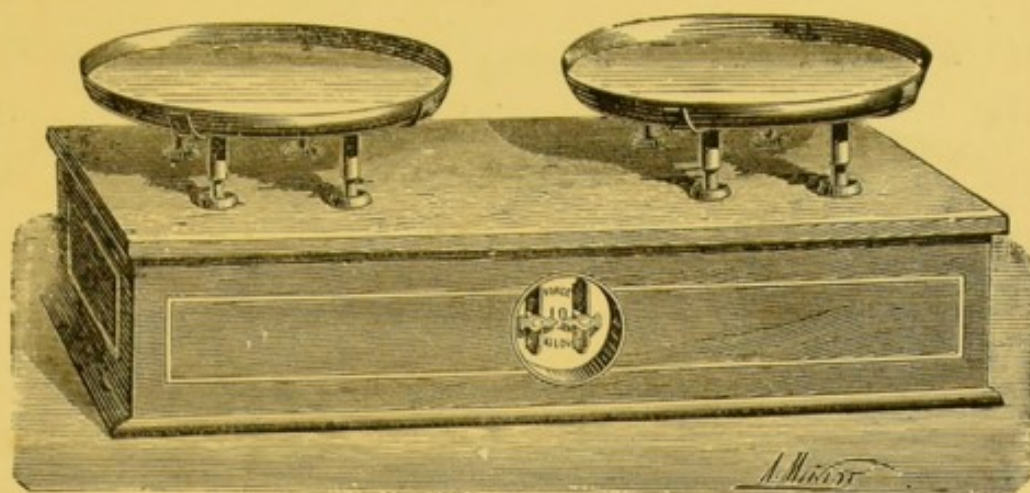


Fig. 3

DRUGGISTS' BOX SCALES.

110 On Polished Black Wood Box, with moveable Brass Pans—

Diam. of pans	5	6	8	9	10	11	12 in.
Capacity ...	1	2	5	10	15	25	30 kilos.
Price ...	20/10	26/8	31/8	41/8	46/8	56/8	62/6

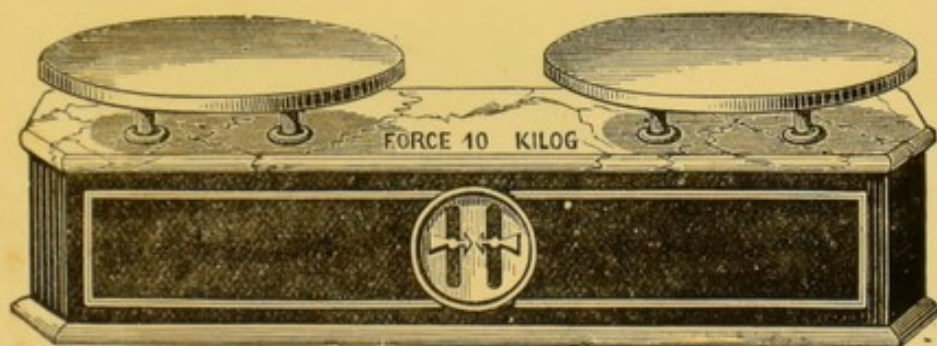


Fig. 4

111 On Polished Black Wood Box, with Marble Top, moveable Brass Pans—

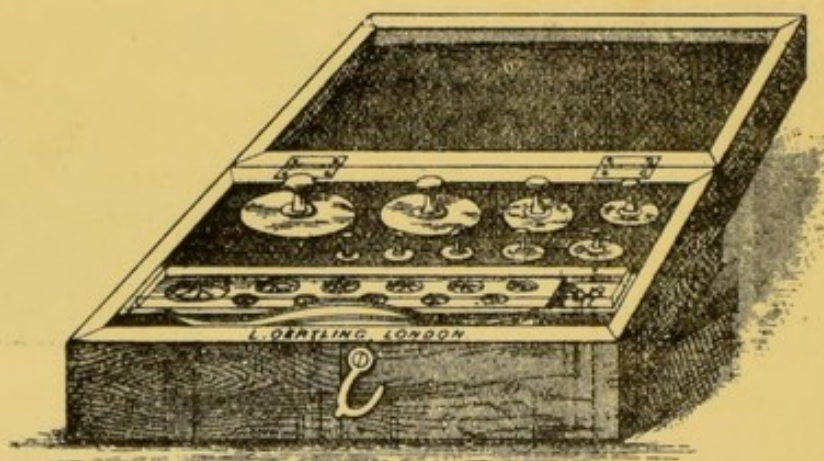
Diam. of pans	5	6	8	9	10	11	12 in.
Capacity ...	1	2	5	10	15	25	30 kilos.
Price ...	26/8	30/	35/	46/8	53/4	58/4	73/4

112 Box made of White Marble richly ornamented, with moveable Brass Pans.
Fig. 5.

Diam. of pans	5	6	8	9	10	11	12 in.
Capacity ...	1	2	5	10	15	25	30 kilos.
Price ...	55/	58/4	73/4	90/	100/	125/	141/8

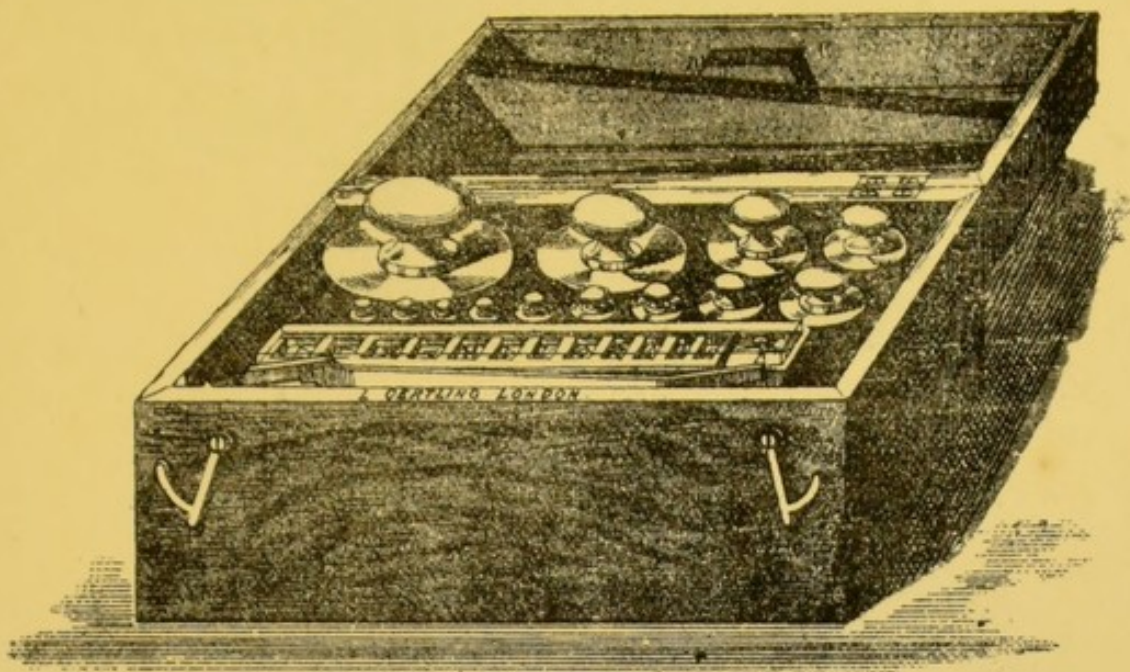
Old
Cat.No.

51	113	Weights, Apothecaries', Brass, in Set, $\frac{1}{2}$ grain to 6 grains, set	£0 0 4
52	114	„ „ $\frac{1}{2}$ scruple to 2 drams, set	0 0 8
53	115	„ Brass, Avoirdupois, 4 oz. to $\frac{1}{4}$ oz., set	0 1 6
54	116	„ „ „ 1 lb. to $\frac{1}{4}$ oz., set	0 3 0
54A	117	„ Iron „ 1 lb. to $\frac{1}{2}$ oz., set	0 1 3
	118	„ „ 1 kilog. to 50 grammes, set	0 2 6
55	119	„ „ Troy Cup form, 4 oz. to $\frac{1}{4}$ oz., set	0 3 6
56	120	„ „ „ „ 12 oz. to $\frac{1}{4}$ oz., set	0 7 6
57	121	„ „ 200 grains to 10 grains, set	0 2 0
58	122	„ „ 5 grammes to 1 centigramme, set	0 1 3
58A	123	Scale Pans, Glass, $2\frac{1}{2}$ in. and 3 in. diameter, with three holes drilled in each for cords per pair	0 1 6



124

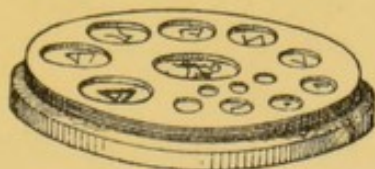
59	124	Weights, Chemical, Oertling's, in Polished Mahogany Box, with Forceps and Riders, 1,000 grains to $\frac{1}{100}$ th	£1 15 0
	125	„ Ditto ditto 600 „ „	1 10 0
	126	„ Ditto ditto 10,000 grains to 1,000 grains	2 5 0
60	127	„ Ditto 50 grammes to 1 milligramme	1 15 0
	128	„ Ditto 100 „ 1 „	2 5 0



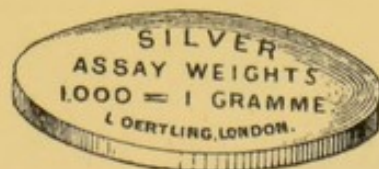
129

Old
Cat.No.

60A	129	Weights, Oertling's, Set containing the following Weights:— 10,000, 6,000, 3,000, 2,000, 1,000, 600, 300, 200, 100, 60, 30, 20, 10, 6, 3, 2, 1, .6, .3, .2, .1, .06, .03, .02, .01 ...	£3 12 0
60B	130	„ Set of 6,000 grains to $\frac{1}{100}$ th grain	3 3 0
60c	131	„ „ 1 kilogramme to 1 milligramme	3 15 0
60D	132	„ „ 500 grammes to 1 milligramme	3 3 0
60E	133	„ „ 1 kilogramme to 100 grammes	2 10 0
61	134	„ Oertling's Sets grains, Platinum, 3/6; tenths, 2/6; hundredths, 3/.	
62	135	„ Oertling's, decigrammes, 6/6; centigrammes 4/6; milli- grammes, 3/.	
63	136	„ Oertling's, Riders, tenths or centigrammes .. each	0 0 6



137



63A	137	Weights, Set of 10 grains and its sub-divisions in 1,000 parts in platinum, for assaying SILVER	1 10 0
63B	138	„ Set of 1 gramme and its sub-divisions in 1,000 parts in platinum, for assaying SILVER	1 10 0
63c	139	„ Set of $\frac{1}{2}$ gramme and its sub-divisions in 1,000 parts in platinum, for assaying GOLD	1 10 0

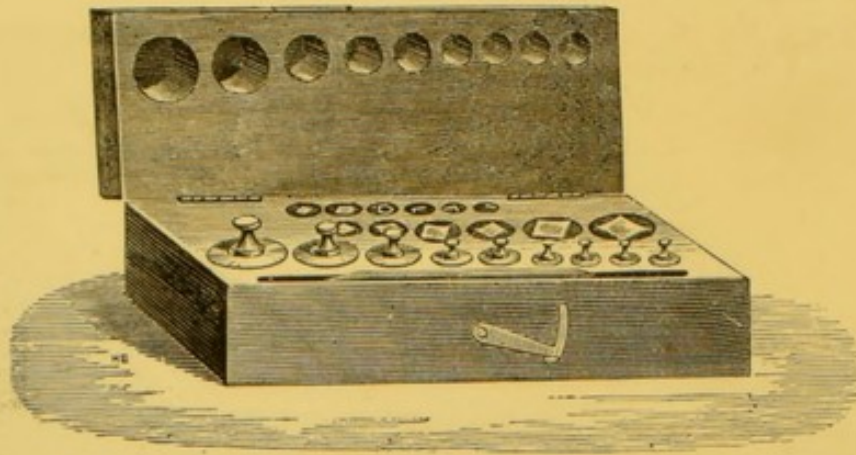


Fig 13.

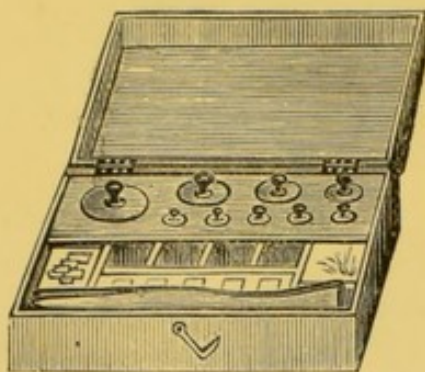
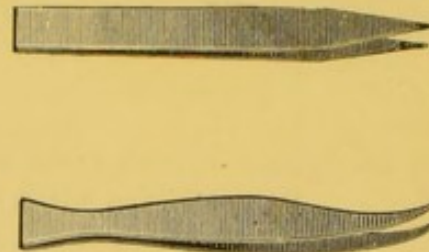


Fig 13A.



Chemical Weights, Becker's No. 2, in Mahogany Box lined with Velvet, every piece fitted separately; the fractions of a gramme are made of Aluminium, adjusted to the utmost accuracy. Fig 13.

Old
Cat No.

64	140	Becker's, No. 12, Set of Weights, 50 gramme and down to a milligramme, with Nickel Plated Forceps and 2 Riders	£1 6 8
64A	141	„ No. 4A, ditto, flat form, with Plate Glass Cover for small Weights, and 2 Riders. Fig. 13A	1 10 0
65	142	„ No. 46, Set of Weights, 1,000 grains and down to $\frac{1}{100}$ th grain, with Nickel Plated Forceps, & 2 Riders. Fig. 13	1 6 8
65B	143	„ No. 47, ditto, flat form, with Plate Glass Cover, for small Weights, Fig 13A	1 10 0

Chemical Weights, No. 4, in French Polished Mahogany Box, lined with Green Cloth, ditto. Fig. 13.

66	144	Becker's, No. 25, Set of Weights, 500 milligrammes and down to 1 milligramme, with Brass Forceps	£0 7 0
67	145	„ No. 26, Set of Weights, 1,000 milligrammes and down to 1 milligramme, with Brass Forceps	0 8 0
68	146	„ No. 28, Set of Weights, 50 grammes and down to 1 milligramme, with Brass Forceps	0 11 8

Old Cat.No.					
69	147	Becker's, No. 29, Set of Weights, 100 grammes and down to 1 milligramme, with Brass Forceps	... ..	£0	12 6
	148	„ No. 30, Set of Weights, 200 grammes and down to 1 milligramme, with Brass Forceps	... ..	0	14 2
70	149	„ No. 31, Set of Weights, 500 grammes and down to 1 milligramme, with Brass Forceps	... ..	0	18 4
71	150	„ No. 32, Set of Weights, 1,000 grammes and down to 1 milligramme, with Brass Forceps	... ..	1	4 2
71A	151	„ No. 32A, Two 1 kilogrammes to 1 milligramme together 3 kilogrammes, ditto ditto	... ..	1	15 0
71B	152	„ No. 32B, One 2 kilogramme, Two 1 kilogrammes, to 1 milligramme, together 5 kilogrammes, ditto	... ..	2	14 2
71c	153	„ No. 32c, One 5 kilogramme, One 2 kilogramme, Two 1 kilogramme, 1 milligramme, together 10 kilogrammes, ditto ditto	... ..	4	11 8
72	154	„ No. 53, Set of Weights, 1,000 grains and down to $\frac{1}{100}$ th grain, with Brass Forceps	... ..	0	11 8
73	155	„ No. 54, Set of Weights, 2,000 grains and down to $\frac{1}{100}$ th grain, with Brass Forceps	... ..	0	12 6
74	156	„ No. 55, Set of Weights, 5,000 grains and down to $\frac{1}{100}$ th grain, with Brass Forceps	... ..	0	14 2
75	157	„ No. 56, Set of Weights, 10,000 grains and down to $\frac{1}{100}$ th grain, with Brass Forceps	... ..	0	18 4

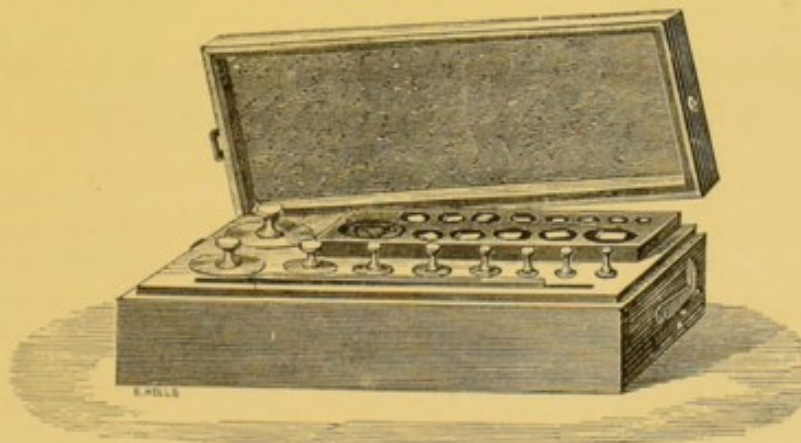


Fig. 12

Becker's Weights, No. 1, adjusted to the utmost accuracy. Brass Weights Lacquered, the fraction of a gramme Platinum, except below 20 milligrammes which are Aluminium. Fig. 12.

75A	158	Becker's, No. 4, 50 grammes, and down to 1 milligramme, with 3 Riders	... ..	£2	1 8
75B	159	„ No. 5, 100 grammes, and down to 1 milligramme, with 3 Riders	... ..	2	6 8
75c	160	„ No. 6, 200 grammes, and down to 1 milligramme, with 3 Riders	... ..	2	18 4

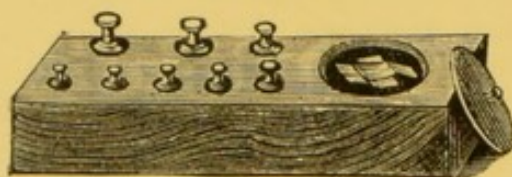
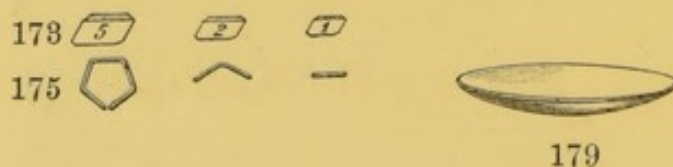


Fig 14

Gramme and Grain Weights, No. 5, in Mahogany Blocks.

Old Cat.No.						
77	161	Becker's Set of Weights, No. 37,	50 grammes to 1 gramme	£0	4	2
	162	" "	" 37A 50 " to 1 centigramme	0	7	6
78	163	" "	" 38 100 " to 1 gramme	0	5	0
79	164	" "	" 40 500 " to 1 "	0	8	9
80	165	" "	" 41 1,000 " to 1 "	0	12	6
	166	" "	" 41A 2 × 1 kilogs to 1 gramme	0	15	10
80A	167	" "	" 41B 2 kilogs to 1 "	1	0	0
81	168	" "	" 58A 1,000 grains to 1/10th "	0	7	6
82	169	" "	" 59A 2,000 " to 1/10th "	0	8	4
83	170	" "	" 60A 5,000 " to 1/10th "	0	10	0
84	171	" "	" 61A 10,000 " to 1/10th "	0	12	1
85	172	" "	" 62A 20,000 " to 1/10th "	0	15	10



86	173	Becker's Set of Weights, Aluminium,	5 2 2 1 decigrammes	£0	1	8
87	174	" "	" " centigrammes	0	1	8
88	175	" "	" " milligrammes	0	1	4
89	176	" "	" " grains ...	0	1	8
90	177	" "	" " tenths ...	0	1	8
91	178	" "	" " hundredths ...	0	1	4
92	179	Watch Glasses, accurately adjusted ...	... per pair	0	1	8

Aspirators. See Bottles with Tubulure.

180 Horn Dishes, adjusted accurately to fit Balances—

5	6	8	9½	11½	15	17	20 cent. diam.
1/8	1/8	2/6	3/4	4/2	5/10	6/8	7/6 per pair.



181

Old
Cat.No.

Balloons. Gold Beater's Skin, for Hydrogen and Coal Gas.

93	181	18	27	32	36	42	48	58	72 in. circumference		
		1/	1/6	2/	2/6	3/6	4/6	7/	12/6 each.		
94	182	Balloons, Gold Beater's Skin, in the shape of Punch, 6 ft. high by 9 ft. circumference							£3	3	0
95	183	„	„	Elephant, 3 ft. long and 2½ ft. high					1	15	0
96	184	„	„	Fish 5/, 7/6 and					0	10	6
97	185	„	Collodion, various colors 9d., 1/ and					0	2	0	



186



187

PORCELAIN EVAPORATING BASINS.

Basins, for Evaporating, with Spout, finest Berlin Porcelain, for Analytical Purposes, with Royal Mark, glazed inside and out, as Fig. 186 to No. 5. No. 6 to 12 glazed inside and partially outside; form as Fig. 187.

98	186	Nos.	00	0	1	2	3	4	5
		Diameter	2¾	3¼	3½	3¾	4	4¼	4¾ inches
		Capacity	2	2½	3	4	6	8	10 ozs.
			4d.	6d.	8d.	10d.	1/	1/2	1/6 each.
99	187	Nos.	6	7	8	9	10	11	12
		Diameter	6	7¼	8½	10	12	14	15½ inches
		Capacity	15	25	45	80	140	220	380 ozs.
			1/9	2/3	2/9	4/6	7/	9/	24/ each



188

Old
Cat.No.

100 188 Basins, Berlin Porcelain, deep form, with Spouts. Fig. 188.

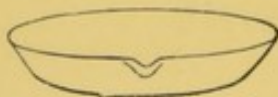
Nos.	1	2	3	4	5
Diameter	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$ inches
Capacity	18	30	45	70	90 ozs.
	2/6	3/3	4/6	5/3	6/3 each



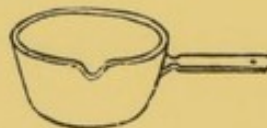
189

101 189 Basins, Berlin Porcelain, shallow form, with Spout. Fig. 188.

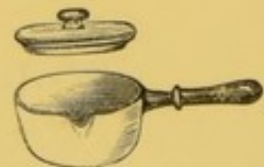
No....	...	1	2	3	4	5	6	7
Diameter	...	$2\frac{3}{4}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6 ins.
Capacity	...	$1\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$	5	8	12	18 oz.
		5d.	8d.	10d.	1/	1/2	1/8	2/ each



190



191



192

102 190 Basins, Evaporating. Meissen (Dresden) Porcelain, Shallow, thin with Spout. Fig. 190.

Diam.	$2\frac{3}{8}$	$3\frac{1}{4}$	$4\frac{1}{4}$	5	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	10	11	12 in.
Capacity	$1\frac{3}{4}$	$2\frac{1}{2}$	6	8	12	20	30	45	60	100	140 ozs.
	4d.	5d.	8d.	10d.	1/3	1/9	2/4	3/	3/9	4/6	6/ each

103 191 Basins, Berlin Porcelain, with Porcelain Handle, and Spout (Capsules or Ladles).

Diameter	...	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$5\frac{1}{4}$	7 inches
Capacity	...	3	6	11	24	40 oz.
		1/3	1/8	2/3	3/6	4/6 each

Old
Cat.No.

104 192 Basins, Berlin Porcelain, with Polished Wooden Handle and Cover.

Diameter	...	3 $\frac{1}{4}$	3 $\frac{1}{2}$	4	4 $\frac{3}{8}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$ inches
Capacity	...	6	8	12	20	24	42 ozs.
		1/6	1/9	2/	3/	4/	5/ each



193

105 193 Basins, Evaporating. German Porcelain. Glazed inside only.

Diam.	7 $\frac{1}{4}$	8	9 $\frac{1}{4}$	10 $\frac{1}{4}$	11 $\frac{1}{4}$	12 $\frac{1}{2}$	13 $\frac{1}{2}$	14 $\frac{1}{2}$	16	17 $\frac{1}{4}$	18 $\frac{1}{4}$ ins.
Capacity	24	34	40	52	85	130	180	220	280	320	360 ozs.
	10d.	1/	1/6	2/	2/10	4/6	5/6	6/	7/6	10/	16/ each

106 194 Basins, Berlin Porcelain, Berlin form, with Spout, and as Figs. 186 and 187. Very similar to those made at the Royal Works.

Diam.	2 $\frac{7}{8}$	3 $\frac{1}{8}$	3 $\frac{1}{4}$	3 $\frac{5}{8}$	4	4 $\frac{1}{2}$	4 $\frac{3}{4}$	6	7 $\frac{1}{4}$	8 $\frac{1}{4}$	9 $\frac{3}{8}$	10 $\frac{1}{4}$	12	14	15 $\frac{1}{2}$ ins.
Capacity	1 $\frac{1}{2}$	2	3	3 $\frac{1}{2}$	5 $\frac{1}{2}$	9	12	16	26	50	90	120	140	220	380 ozs.
	3d.	4d.	5d.	6d.	8d.	10d.	1/2	1/4	2/	3/	3/6	4/6	6/	10/	16/ each

107 195 Basins, German Porcelain, Thin, Deep form, with Spout, similar to Fig. 188, Glazed inside only.

No.	...	0	1	2	3	4	5	6	7	8	9
Diameter	2	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 $\frac{3}{8}$	3 $\frac{7}{8}$	4 $\frac{1}{2}$	5	5 $\frac{1}{2}$	6	6 $\frac{5}{8}$ ins. about	
Capacity	1	1 $\frac{1}{2}$	2 $\frac{1}{2}$	4	5 $\frac{3}{4}$	8	10 $\frac{1}{2}$	14	18	24 oz. ,,	
	2d.	2d.	2 $\frac{1}{2}$ d.	3d.	4d.	5d.	6d.	7d.	8d.	9d. each	

108 196 Basins, German Porcelain (Capsules or Dippers), with Porcelain Handle and Spout, as Fig. 191.

Diameter	3 $\frac{1}{8}$	4	4 $\frac{1}{8}$	4 $\frac{1}{2}$	5 $\frac{1}{4}$	6 $\frac{1}{4}$ inches
Capacity	5	8	10	15	25	40 oz.
	8d.	10d.	1/	1/6	2/	3/ each



197

Old
Cat.No.

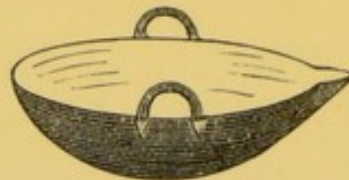
108A 197 Basins, Thuringian Porcelain, Thin, with good Spouts for Pouring, glazed inside, biscuit outside. Fig. 197.

Diameter	2¼	2⅝	3¼	3⅝	3⅞	4½	5¼	5¾	6 ins. about
Capacity	1	1½	2	3½	5	8	10	14	20 ozs. ..
	2d.	3d.	4d.	5d.	6d.	8d.	9d.	10d.	1/ each

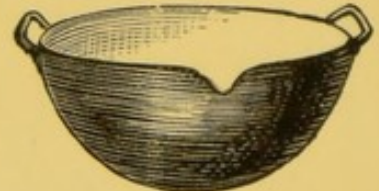
Set of 9 as above, 4/6.



198



199



200

108B 198 Basins, Enamelled Iron Evaporating, with Lip. Fig. 198.

6	7	8	9	10	12 in. diameter
9d.	10d.	1/	1/2	1/6	2/6 each

108c 199 Basins, Enamelled Iron Evaporating, with Lip and Wire Handles cast on. Fig. 199.

Diameter	8	9	10	11	12	13	14	15	16 in.
	1/	1/4	1/8	2/	2/6	3/	3/6	4/6	6/6 each

200 Basins, Enamelled Iron Evaporating, Sheet Iron, thin, with Wire Handles, 6 in. diameter, 3 in. deep ... each £0 2 6



201

108D 201 Enamelled Iron Digester, with Wire Handles cast on, and Tin Top with 5 holes for Evaporating Basins, Test Tubes, Thermometer, &c. 8 in. diameter £0 5 6



202



203



204

Old
Cat.No.

109 202 Basins, Glass, Bohemian, deep, with Spout and Ground Edge.

Diam.	1 $\frac{3}{4}$	2 $\frac{1}{4}$	2 $\frac{7}{8}$	3 $\frac{1}{4}$	4	4 $\frac{1}{2}$	5	5 $\frac{1}{4}$	6 $\frac{1}{4}$	7 $\frac{1}{2}$	8 $\frac{1}{2}$	9 $\frac{1}{2}$	10 $\frac{1}{2}$ in.
Capacity	1	2	3	5	8	11	16	18	25	30	40	70	80 ozs.
	2d.	3d.	4d.	5d.	6d.	7d.	8d.	9d.	10d.	1/2	1/6	2/	2/6 each.

110 203 Basins, Bohemian Glass, without Spout, Ground Edge, Water Analysis.

Diameter	...	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$ inches
Capacity	...	6	8	11 ozs.
		5d.	6d.	7d. each

111 204 Basins, Bohemian Glass, with Flat Bottom and Ground Edges, (Crystallizing Dishes).

Diam.	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3 $\frac{1}{8}$	3 $\frac{1}{2}$	4	4 $\frac{1}{2}$	5 $\frac{1}{4}$	5 $\frac{3}{4}$	6 $\frac{3}{8}$	8	9	10 inches
Capacity	2 $\frac{1}{2}$	4 $\frac{1}{2}$	8	10	14	20	25	35	65	120	160	200 ozs.
	3d.	3d.	4d.	5d.	6d.	7d.	8d.	10d.	1/	2/	2/6	3/6 each.



205

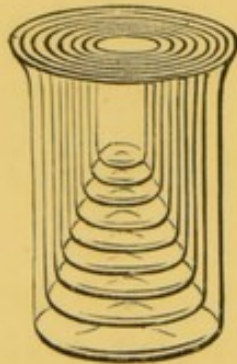


206

112 205 Basins, Platinum, 38/ per oz. for Basins of 1 oz. weight and upwards ; Basins weighing less than 1 oz. are charged extra to allow for cost of manufacture, 1 oz. capacity being about $\frac{3}{4}$ oz. weight.

206 ,, Evaporating, Nickel Metal, Polished, suitable for Alkalis, &c.

Diameter	1 $\frac{5}{8}$	2	2 $\frac{3}{8}$	2 $\frac{3}{4}$	3 $\frac{3}{8}$	4	6 in.
	1/6	1/9	2/3	3/	3/9	4/6	8/ each



207

Old
Cat.No.

113 207 **Beakers, Finest Bohemian Glass for Hot Solutions, and uniform thickness.**

No. 000,	capacity	$\frac{3}{4}$ oz.,	depth	$1\frac{3}{4}$ in.,	diam. internal at top	$1\frac{1}{2}$ in.,	each	2d.,	doz.	1/9
" 00	"	$1\frac{1}{4}$	"	$2\frac{1}{8}$	"	"	1	2d.	"	1/9
" 0	"	$1\frac{3}{4}$	"	$2\frac{1}{2}$	"	"	1	3d.	"	2/9
" 1	"	3	"	3	"	"	1	4d.	"	3/6
" 2	"	$4\frac{1}{2}$	"	$3\frac{1}{2}$	"	"	1	5d.	"	4/6
" 3	"	7	"	4	"	"	2	6d.	"	5/6
" 4	"	11	"	$4\frac{1}{2}$	"	"	2	7d.	"	6/6
" 5	"	16	"	$5\frac{1}{4}$	"	"	2	8d.	"	7/6
" 6	"	22	"	$5\frac{3}{4}$	"	"	3	9d.	"	8/
" 7	"	32	"	$6\frac{1}{2}$	"	"	3	10d.	"	9/
" 8	"	46	"	$7\frac{1}{4}$	"	"	4	1/	"	11/
" 9	"	64	"	$8\frac{1}{4}$	"	"	4	1/2	"	
" 10	"	90	"	$9\frac{1}{2}$	"	"	4	1/6	"	
" 11	"	120	"	$10\frac{1}{2}$	"	"	5	1/9	"	
" 12	"	150	"	$11\frac{1}{4}$	"	"	5	2/	"	

114 208 **Beakers, Bohemian Glass, in Sets, same sizes and capacity as above.**

Sets of 3	No. 000 to 0	per set	6d.	Sets of 5	No. 2 to 6	per set	2/6
" 3	" 00	" 1	" 7d.	" 5	" 3	" 7	" 3/0
" 3	" 0	" 2	" 9d.	" 5	" 4	" 8	" 3/6
" 3	" 1	" 3	" 10d.	" 6	" 0	" 5	" 2/2
" 3	" 2	" 4	" 1/	" 6	" 1	" 6	" 2/8
" 3	" 3	" 5	" 1/6	" 8	" 1	" 8	" 4/3
" 4	" 1	" 4	" 1/4	" 10	" 1	" 10	" 6/6
" 5	" 0	" 4	" 1/6	" 12	" 1	" 12	" 9/
" 5	" 1	" 5	" 2/				

115 209 **Beakers, Bohemian Glass, Wide Form, diameter about two-thirds the Height.**

No. 00	capacity	1 oz.	each	2d.	No. 7	capacity	40 oz.	each	1/2
" 0	"	$1\frac{3}{4}$	"	" 3d.	" 8	"	56	"	1/4
" 1	"	3	"	" 4d.	" 9	"	80	"	1/6
" 2	"	5	"	" 6d.	" 10	"	100	"	1/8
" 3	"	8	"	" 7d.	" 11	"	124	"	2/
" 4	"	12	"	" 8d.	" 12	"	180	"	2/3
" 5	"	18	"	" 9d.	" 13	"	220	"	2/6
" 6	"	27	"	" 11d.					

Old
Cat.No.

116 210 **Beakers, Bohemian Glass, Wide Form, as 209,
in Sets.**

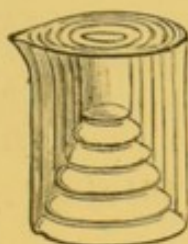
Nest of 5	Nos. 1 to 5	each set 2/6
" 8	" 1 " 8	" 5/6
" 15	" 00 " 18	" 12/6

117 211 **Beakers, Bohemian Glass, Tall Form, diameter
about one-third the Height.**

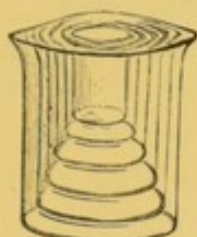
No. 1	capacity 7 oz.	each 6d.	No. 5.	capacity 32 oz.	each 1/
" 2	" 10 "	" 7d.	" 6	" 50 "	" 1/3
" 3	" 14 "	" 8d.	" 7	" 70 "	" 1/5
" 4	" 20 "	" 10d.	" 8	" 90 "	" 1/6

Ditto, ditto.

118 212 Nest of 8 No. 1 to 8 per set 6/



213



215



216



217

119 213 **Beakers, Bohemian Glass, Tumbler Form, with
Spout.**

No. 0	capacity 3 oz.	each 4d.	No. 6	capacity 40 oz.	each 1/2
" 1	" 5 "	" 5d.	" 7	" 54 "	" 1/4
" 2	" 8 "	" 6d.	" 8	" 70 "	" 1/6
" 3	" 12 "	" 8d.	" 9	" 90 "	" 1/9
" 4	" 20 "	" 10d.	" 10	" 110 "	" 2/
" 5	" 25 "	" 1/	" 11	" 145 "	" 2/3

120 214 **Beakers, Bohemian Glass, same capacity and
form as above, in Nests.**

Set 3	No. 0 to 2	price per nest 1/	Set 5	No. 1 to 5	price per nest 3/
" 8	" 1 " 3	" 1/4	" 6	" 1 " 6	" 4/
" 4	" 0 " 3	" 1/10	" 8	" 0 " 7	" 5/4
" 4	" 1 " 4	" 2/	" 12	" 0 " 11	" 11/6

121 215 **Beakers, Bohemian Glass, same capacity as
above, with 2 Spouts.**

2d. each Beaker extra.

Old
Cat.No.

1596 216 **Townson and Mercer's Registered Tablet Beakers, &c.**

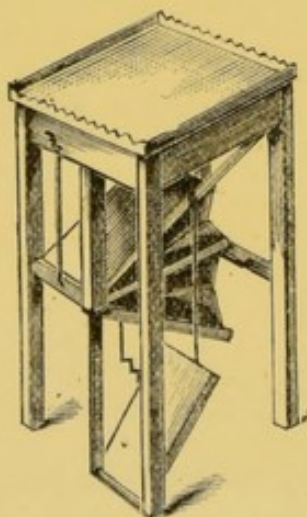
The above is an application of the Sand Blast Process to Beakers, &c., forming a label on the vessels on which the substances under examination can be written with an ordinary lead pencil, thus obviating the difficulty of paper labels which are constantly being washed off, and record of the preparation lost. Flasks, Burettes, &c., are Sand Blasted in the same way, 2d. each extra to the ordinary prices.

122 217 **Beakers, Bohemian Glass, Precipitating, Conical, with Lip. Phillips' Form.**

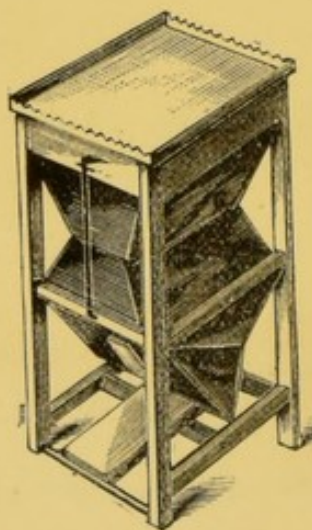
Capacity	2 oz.	each	4d.	Capacity	30 oz.	each	1/
"	5 "	"	6d.	"	40 "	"	1/3
"	10 "	"	8d.	"	60 "	"	1/6
"	14 "	"	9d.	"	80 "	"	1/10
"	20 "	"	10d.				

Bell Glasses. See Air Pump Receivers and Gas Jars.

- 123 218 **Bellows**, double action, Blowpipe Table with Zinc Plate Cover, Jet, and Universal Joint £4 0 0
- 124 219 ,, Ditto, with Iron Forge Plate, and Sheet Iron Cylinder lined with Fire Clay 7 5 0
- 125 220 Gas T Union for above 0 2 6
- 126 221 **Bellows**, FLETCHER'S. For description, see Fletcher's List at end of Book.



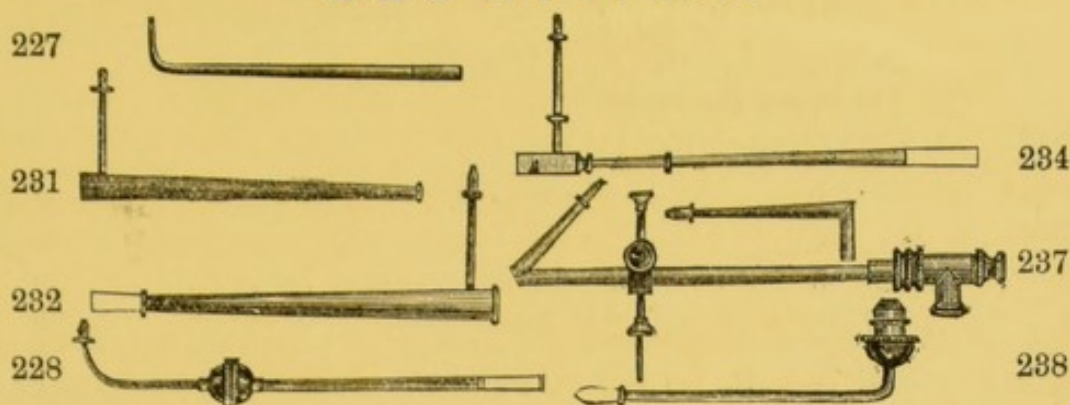
222



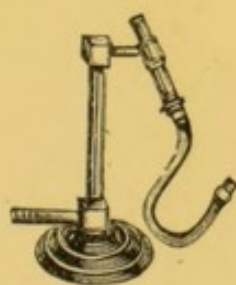
223

- 131 222 **Bellows Table**, on Strong Wood Frame, with Sheet Iron Top, and Strong Bellows... .. £8 15 0
- 132 223 ,, Ditto, more powerful Blast, and larger Reservoir 5 0 0
- 133 224 **Bladders**, prepared Stout Gold Beaters' Skin, for Gas Experiments, each 0 1 6
- 134 225 ,, Ditto, fitted with Brass Ferrule 0 2 3
- 135 226 ,, Ditto, fitted with Ferrule, Stopcock, and Jet 0 5 3

BLOWPIPES.



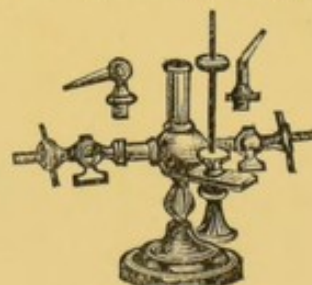
<p>Old Cat.No.</p>	<p>186 227</p>	<p>Blowpipe, common Brass per doz. 5/, each</p>	<p>£0 0 6</p>
	<p>187 228</p>	<p>„ Cronstedt's, Brass, with two Jets „</p>	<p>0 2 6</p>
	<p>188 229</p>	<p>„ Cronstedt's, Brass, with Ivory Mouthpiece .. „</p>	<p>0 3 0</p>
	<p>189 230</p>	<p>„ Pepy's „</p>	<p>0 5 6</p>
	<p>140 231</p>	<p>„ Black's, Japanned Tin ... per doz. 6/ .. „</p>	<p>0 0 7</p>
	<p>141 232</p>	<p>„ „ Brass, with Ivory Mouthpiece „</p>	<p>0 1 6</p>
	<p>142 233</p>	<p>„ „ „ best „</p>	<p>0 2 0</p>
	<p>143 234</p>	<p>„ Plattner's, with Platinum Tip „</p>	<p>0 4 6</p>
	<p>144 235</p>	<p>„ „ with Moveable Platinum Jet „</p>	<p>0 5 0</p>
	<p>145 236</p>	<p>„ „ with Gas Connector & Stopcock „</p>	<p>0 7 6</p>
	<p>146 237</p>	<p>„ Maughan's, for Oxyhydrogen „</p>	<p>1 0 0</p>
	<p>146A 238</p>	<p>„ Spirit, with Gauze and Copper Reservoir for Methylated Spirit or Petroleum, and Ivory Mouthpiece „</p>	<p>0 2 6</p>



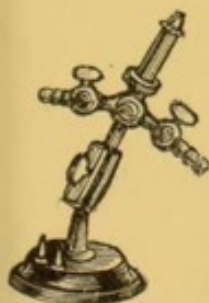
239



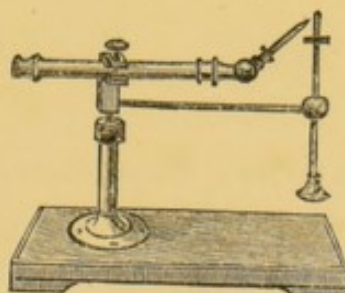
240



241



242



245

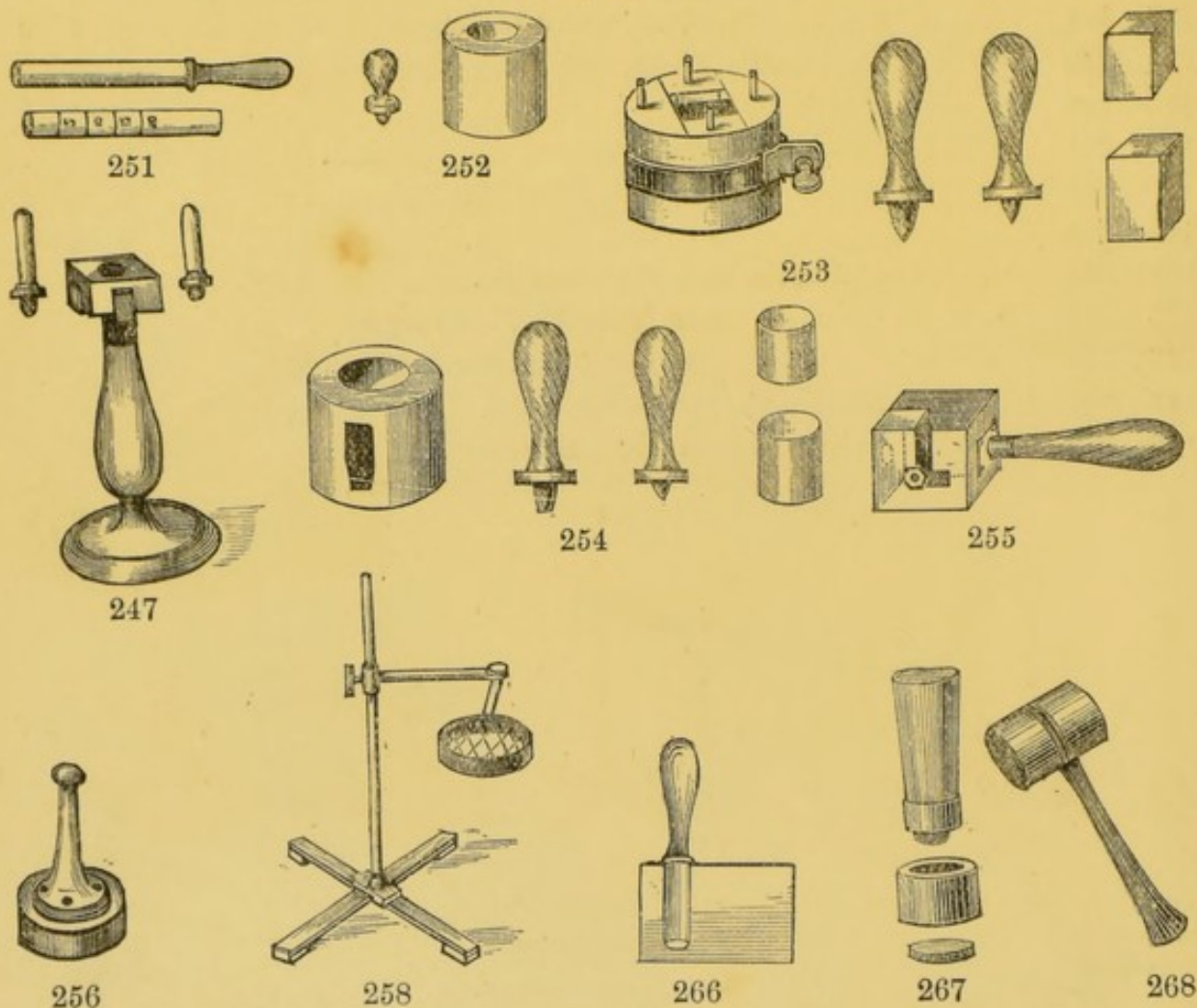


246

147	239	Blowpipe, Gas. Herapath's form	£0 7 6
148	240	„ „ „ with Stopcock, Universal Joint, and two extra Jets ... 8/6, 10/6, 12/6 and	0 15 0

	Old Cat.No.						
149	241	Blowpipe, Oxyhydrogen, Palmer's, with two Platinum Jets, and Lime Holder, on Stand	...	...	...	...	£2 5 0
150	242	,, Oxyhydrogen, Palmer's Modification, can be used as ordinary Blowpipe	...	...	...	...	1 5 0
151	243	,, Oxyhydrogen, Heming's	...	...	...	...	0 7 6
152	244	,, ,, ,, with Lime Holder	...	...	...	...	0 12 6
153	245	,, ,, ,, ,, ,, on Stand	...	...	...	...	0 16 6
154	246	,, ,, for Lime Light, mounted on tall Stand, with a Sliding Rod to adjust the Lime Cylinder	...	...	...	...	1 5 0

Blowpipes, Fletcher's. For Prices and Illustrations, see Fletcher's List at end of Book.



Blowpipe Apparatus, Plattner's, for Cupellation.

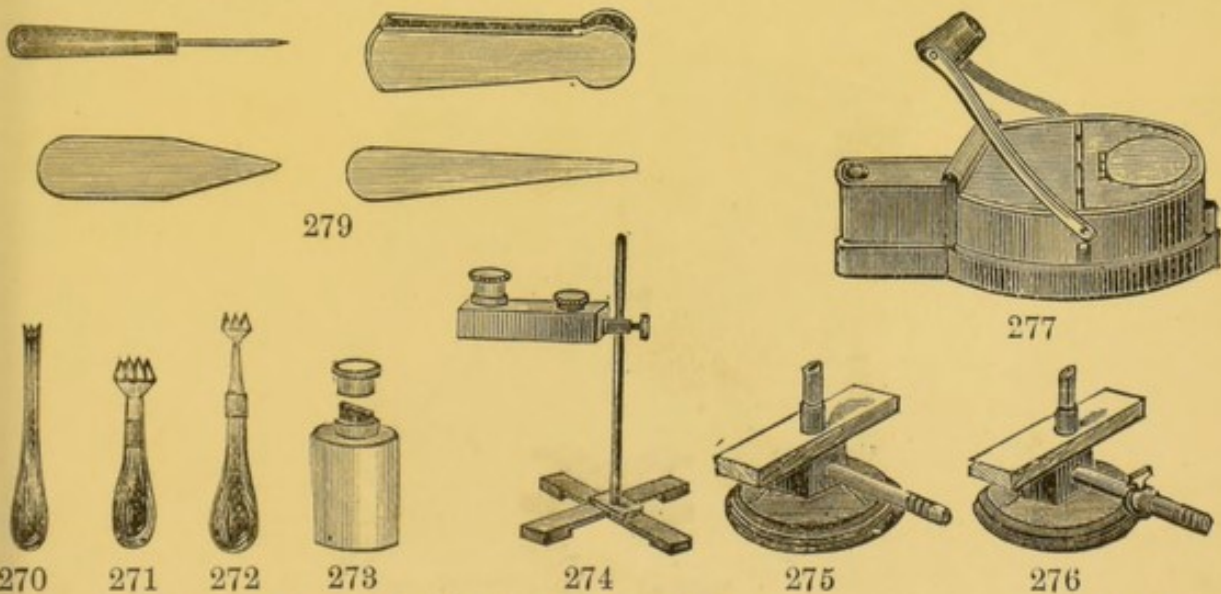
162	247	Plattner's Mould with support, Polished Hardened Steel	...	...	...	...	£0 10 6
163	248	,, ,, ,, ,, Iron	...	...	...	...	0 7 0
164	249	Lead Sieve	...	...	...	...	0 1 6
165	250	Iron Measure	...	...	...	...	0 1 6
166	251	Box Wood Pestle to slide into Graduated Glass Tube	...	...	...	...	0 1 6
167	252	Mould for making Charcoal Capsules, $\frac{3}{4}$ in.	...	...	...	...	0 2 0

Old
Cat.No.

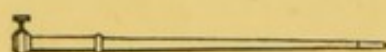
168	253	Mould for preparing Blocks of Charcoal for Roasting in the Analysis of Metallic Ore, the set	£1	10	6
169	254	,, for making Cylindrical Blocks of Charcoal with Crucible Cavity, the set	0	6	0
170	255	Roasting Furnace for Square Blocks of Carbon	0	6	0
171	256	Mould for making Capsules of Porcelain or Clay, Gun Metal in 4 pieces	0	10	6
172	257	Box Mould for making Capsules	0	2	0
173	258	Trellis Support	0	6	0
175	259	Iron Ring, fitted with Triangle, for the above	0	3	0
176	260	Blowpipe Jets, Straight or Curved, for Bladder of Oxygen	0	2	6
177	261	Blowpipe Jets, of Platinum, each 2/ and	0	3	0
178	262	Blowpipe Charcoals, Swedish 2 in. × 1 in. ... per doz.	0	2	0
179	263	,, ,, large blocks about 6 in. × 2 in., each ...	0	0	6
179A	264	,, ,, Blocks Compressed Carbon, 6 in. × 1 in.	0	0	6
179B	265	,, ,, Charcoal Saw	0	1	6
179C	266	,, Boxwood Mould to assist in rolling paper into case	0	0	6
179D	267	,, Cupel Mould in Polished Boxwood—			

1	1¼	1½	2 inches
2/6	3/6	4/	5/

179E	268	Boxwood Mallet for Do.	0	2	6
179F	269	Cobalt, Green, Yellow and Red Glass, 2 in. × 1 in., each ...	0	0	2



180	270	Charcoal Borer, Steel, with Spatula End	£0	1	0
181	271	,, ,, with Wood Handle, for Holes ¼ in. diam. ...	0	5	0
182	272	,, ,, ,, with Flat ,, Wickholder, and Brass Screw Cap 3/ and	0	2	6
183	273	Oil Lamp, Brass, with Flat ,, Wickholder, and Brass Screw Cap 3/ and	0	3	6
184	274	,, on Brass Stand with Folding Legs, Portable ...	0	8	6
184A	275	Gas Burner, with Wood Support for Blowpipe Experiments	0	2	0
184B	276	,, with Stopcock	0	4	0
184C	277	Lamp Glass Blowers, Tin, with Hood and arrangement for altering the size and height of Wick, and Tray for overflow of Oil	0	4	6
184D	278	Cotton Wick for Do. per bundle	0	1	0
184E	279	Set Glass Blower's Tools, consisting of Flat Tongs, Iron Rod in Handle, Iron Cone, Flat Iron Plate	0	2	6



280



281



282



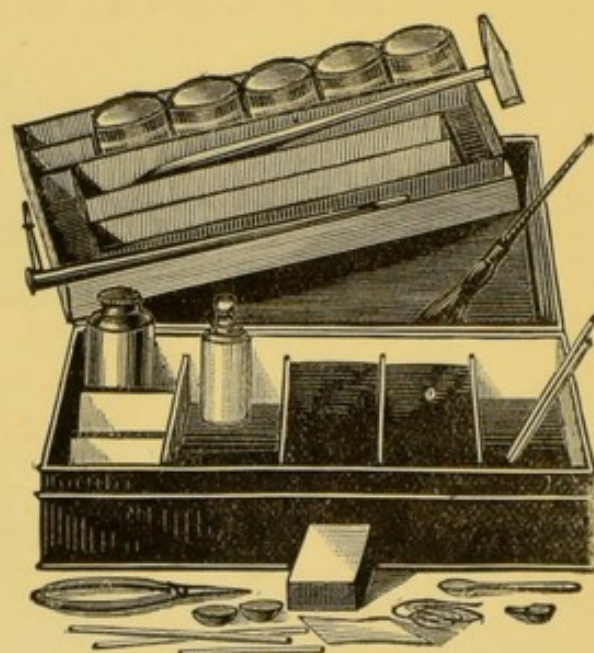
283



284

Old
Cat.No.

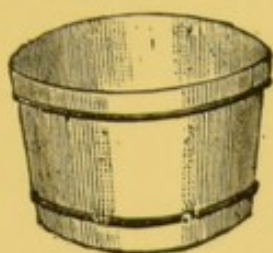
185	280	Platinum Spoon and Wire Holder, with Wood Handle	...	£0	2	0
186	281	„ Spoon	... .. 1/6 to	0	4	6
187	282	Porcelain Cups	... .. each 3d., 4d., 6d., and	0	0	8
188	283	Steel Hammer, with Chisel End	... ..	0	2	6
189	284	„ Anvil 1½ in. × 1½ in. × ¾ in.	... ..	0	1	0
190	285	Tubes of Hard Glass, closed at one end	... per doz.	0	2	0
190A	286	„ „ 6 × ¼ in., open both ends	per doz.	0	0	9



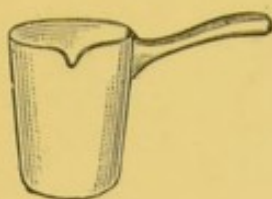
287

- 191 287 **Blowpipe Cabinet in Japanned Tin Case, for the Pocket—**
 Size of Case, 9 in. × 5 in. × 3 in. Brass Black's Blowpipe, Brass Oil Lamp, Steel Hammer and Anvil, Platinum Spoon, Platinum Wire and Foil, Steel Forceps, German Silver Test Spoon, File and Handle, 2 Porcelain Cups, assortment of Hard Glass Tubes closed and open. Charcoals; BLOWPIPE RE-AGENTS:—Borax, Sodium Carbonate, Microcosmic Salt, Potassium Nitrate, Cobalt Nitrate, and Potassium Bisulphate £1 1 0

The above with Agate Mortar and Platinum Pointed Forceps, 10/6 extra.



288



290



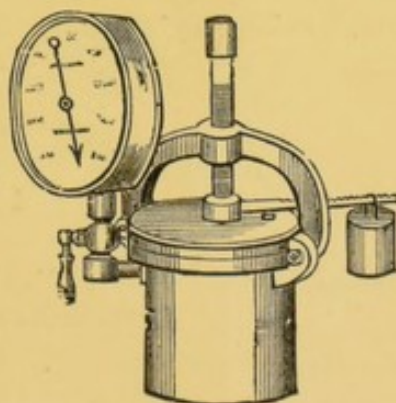
295

Old
Cat.No.

192	288	Boilers or Solution Pans, German Porcelain, glazed inside and out, capacity 12 pints each	£0 8 6
193	289	„ „ „ „ „ 28 „	0 18 6
194	290	„ Porcelain, German with Shanks, glazed inside and out, capacity 1 pint	0 3 0
	291	„ „ „ „ „ 1½ „	0 3 6
	292	„ „ „ „ „ 2 „	0 4 0
	293	„ „ „ „ „ 3 „	0 4 6
	294	„ „ „ „ „ 6 „	0 5 6
195	295	„ Saltglazed Stoneware, for Dyers, &c., 2 galls. ...	0 4 6
	296	„ „ „ 3 „ ...	0 6 0
	297	„ „ „ 5 „ ...	0 9 6



298



302

196	298	Boilers, Digesters, Cast Iron, lined with China, with Valves, capacity, 1 gal., 6s. ; 1½ gal., 8s. ; 2 gals. ...	£0 10 0
197	299	„ Iron, 2 Atmospheres ...	1 10 0
198	300	„ „ 5 „ Turned and Ground Bearings with Gun Metal Valves ...	5 0 0
199	301	„ Do. do. Turned inside ...	6 0 0
200	302	„ Digester, Papyn's, in solid Copper, lined with pure Tin, fitted with Lever Valve, Bridge Clamp and Screw, Steel Bolts and Nuts, and Bourden Pressure Gauge, capacity about 2 quarts ...	10 10 0

Digesters, Copper or Iron, made to Order.



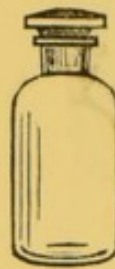
303



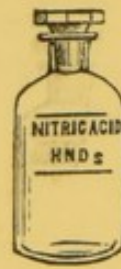
304



307



308



309

Old
Cat.No.

303 Bottles, English Flint Glass, for Test Solutions, Stopped, Moulded, Narrow Mouth

$\frac{1}{4}$	$\frac{1}{2}$	1	2	3	4	6 oz. capacity
2/6	2/6	2/6	3/	3/3	3/6	4/ per doz.

304 Bottles, English Flint Glass, for Dry Chemicals, Stopped, Moulded, Wide Mouth.

$\frac{1}{4}$	$\frac{1}{2}$	1	2	3	4	6	8 oz. capacity
2/6	2/6	2/9	3/	3/6	4/	4/6	5/6 per doz.

201 305 Bottles, Best English Flint Glass, for Test Solutions, &c., Closely Stopped, Narrow Mouth, as Fig. 303.

3 ounces Hand-made, per doz.	5/6	16 ounces, Hand-made, per doz.	12/
4 "	"	20 "	14/
6 "	"	30 "	18/
8 "	"	40 "	21/
10 "	"	60 "	24/
12 "	"	80 "	36/

202 306 Bottles, Best English Flint Glass, for Dry Chemicals, Closely Stopped, Wide Mouth, as Fig. 304.

1 ounce, Hand-made, per doz.	4/4	12 ounces, Hand-made, per doz.	11/6
2 "	"	16 "	12/
3 "	"	20 "	14/
4 "	"	30 "	18/
6 "	"	40 "	21/
8 "	"	60 "	24/
10 "	"	80 "	36/

203 307 Bottles, Best Stout German Glass, Flat Stoppers, free from Lead, very accurately stoppered, Stopper and Bottle Numbered, Narrow Mouth for Test Solutions.

1 ounce	per doz.	4/6	16 ounces ...	...	per doz.	12/6
2 "	"	"	5/6	24 "	"	"	14/
4 "	"	"	6/6	32 "	"	"	18/
6 "	"	"	7/6	48 "	"	"	22/
8 "	"	"	9/	64 "	"	"	30/
12 "	"	"	11/6	100 "	"	"	36/

Old
Cat.No.

204 308 Bottles, Best Stout German Glass, Ditto, Wide Mouth for Dry Chemicals, &c.

1 ounce per doz.	6/	16 ounces per doz.	15/
2 "	7/	24 "	18/
4 "	8/	32 "	22/
6 "	9/	48 "	26/
8 "	10/	64 "	36/
12 "	13/	100 "	45/

The above Bottles Labelled, Sand Roughened, at 6/ per doz.

205 309 Bottles, Best Stout German Glass with Plain and Octagon Cut Glass, Stoppers. Bottles and Stoppers Numbered, with Enamelled Labels Burnt in, for Acids, &c.

6 ounces ... each	Plain 1/9	Cut Stopper 2/	16 ounces ... each	Plain 2/6	Cut Stopper 3/
8 "	2/	2/3	24 "	3/	3/6
12 "	2/3	2/9	32 "	3/6	4/

Bottles, German Glass, Second Quality, do not keep in Stock, but can obtain to order.



310



312



318



314



315

206A 310 Bottles, English, Narrow Mouth, Blown Glass, Clear, for Samples.

1	2	4	6	8	10	16	20 oz.
1/9	2/	2/6	3/	3/6	3/9	4/	4/6 per doz.

206B 311 Bottles, French, Narrow Mouth, Moulded, Round Shouldered.

1	2	4	10	20 oz.
9/	10/	16/	25/	48/ per gross

Corked 1/ to 2/ per doz. extra.

207 312 Bottles, French, Clear White Glass, Wide Mouth, Round Shoulder, for Samples.

Capacity 4 oz.	Per doz. 1/3	Per Gross 12/6
" 8 "	" 1/6	" 15/
" 16 "	" 2/6	" 27/6

Old
Cat.No.

208 313 Bottles, Clear White Glass, Square Shoulders, for Samples, Wide Mouth.

Capacity	1 oz.	Per Gross	12/	Per doz.	1/3
"	2 "	"	14/	"	1/4
"	3 "	"	15/	"	1/8
"	4 "	"	17/	"	2/

Corked 12/ per gross extra.

209 314 ,, German, with Polished Wood Top and Cork, Wide Mouth, for Samples, &c.

1	2	3	4	6 oz. capacity
1/9	2/	2/3	2/6	3/6 per doz.

210 315 ,, English Boxwood Top, polished, lined with Cork, for Samples, &c.

1	2	4	6	8 oz. capacity
3/	3/6	5/	6/6	7/6 per doz.

With Screw on Wood Top and Neck of Bottle, 16 oz. 12/ per doz.



316



317



318



319



320



321



322

211 316 English Green Glass Stoppered Bottles for Acids, &c., and Storing Chemicals in larger quantities.

Capacity	1/4	1/2	1	2	4 pints.
N.M. ...	4/	5/	5/6	6/	8/ per doz.

212 317 W.M. ... 5/ 6/ 7/ 9/ 12/ ,,

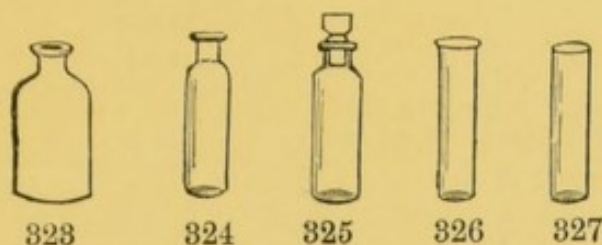
213 318 English Flint Glass Bottles, Stoppered, and Ground Glass Cap for Ether, &c.

Capacity	1/2	1	2	4	6	8	16	20	40 oz.
	1/3	1/3	1/6	1/9	2/	2/3	3/	3/6	4/6 each.

214 319 English Flint Glass Bottles, without Stopper, Wide Mouth, Ground Glass Cap.

Capacity	2	4 oz.
	1/	1/3 each.

	<small>Old Cat.No.</small>								
215	320	Bottles	with long Stopper,	Jewellers,	for Aqua Fortis,	each	£0	1	0
216	321	„	„	Conical form	... ..	„	0	1	0
217	322	„	German,	Capped and long Stoppered,	2 oz.,	„	0	1	0



218 323 Bottles, Gutta Percha, for Fluoric Acid.

Capacity	2	4	8	12	16	32 oz.
	1/	1/3	2/	2/3	2/6	4/6 each.

219 324 Bottles, Clear Glass, made from Tube, for Specimens.

Length	1½	2	2½	3	3½	4	1½	2	2½	3	3½ in.
Diam.	½	½	½	½	½	½	⅝	⅝	⅝	⅝	⅝ in.
	8/	9/	10/	12/	14/	16/	8/	10/	12/	14/	15/ per gross.

Length	4	5	5½	2	2½	3	3½	4	5	6 in.
Diam.	⅝	⅝	⅝	¾	¾	¾	¾	¾	¾	¾ in.
	16/	18/	20/	10/	12/	14/	15/	16/	18/	24/ per gross.

Corked 2/ per gross extra.

220 325 Bottles, Clear Glass, Made from Tube, Stoppered, for Weighing and Specimens.

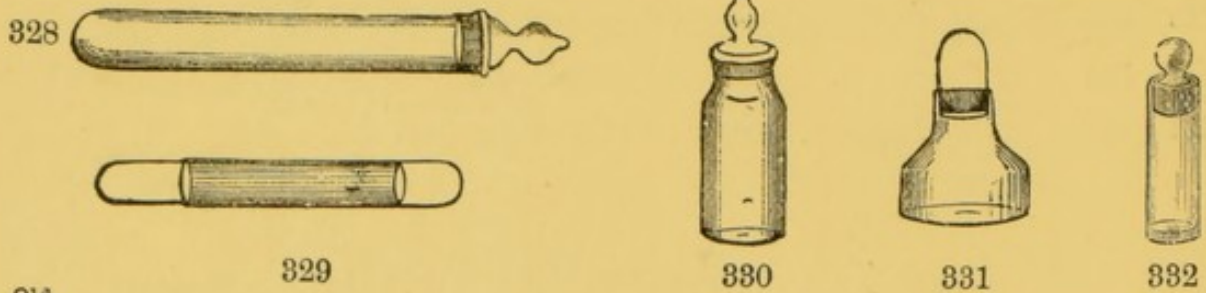
Length	2	2½	3	4 in.
Diam.	⅜	⅜	⅜	½ in.
	1/6	2/	2/6	3/ per doz.

221 326 Bottles, with Lip, Specimen Tubes, 2½ in. × ⅜ in., 6d. per doz., 4/ per gross.

222 327 „ Tube Plain, Clear Glass, without Lip, for Specimens, Powders, &c.

Length	1½	2	2½	3	4	5	2½	3	4	5	6 in.
Diam.	⅜	⅜	⅝	⅝	⅝	⅝	¾	¾	¾	¾	¾ in.
	4/	5/	8/	10/	12/	14/	9/	12/	14/	16/	18/ per gross.

Corked 2/ per gross extra.



Old
Cat.No.

1441 328 Weighing Tubes, for Filters—

Length 3 in.	Diameter $\frac{1}{4}$ in.	Each 8d.
" 4 "	" " "	" 8d.
" $4\frac{1}{2}$ "	" $\frac{3}{8}$ "	" 9d.

1442 329 " For Filters, the inner Tube fitting closely, Length $2\frac{1}{2}$ in.,
Diameter $\frac{5}{8}$ in. per pair £0 0 4

1443 330 " Stoppered, with Wide Neck—

Height to Neck 2 in.	Diameter 1 in.	Each 8d.
" $2\frac{1}{2}$ "	" $1\frac{1}{8}$ "	" 9d.
" 3 "	" $1\frac{1}{4}$ "	" 10d.

1444 331 Weighing Bottle, with Stoppered Cap, Diameter at base,
 $1\frac{1}{2}$ in., Capacity about 20 c.c. each 0 0 9

1444A 332 " With Stopper, without Neck, same diameter throughout.

3 in. × 1 in.	... ... each	1/
3 in. × $1\frac{1}{8}$ in.	... ... "	1/3



333



335

223 333 Bottles, Tin, for Methylated Spirits, &c.

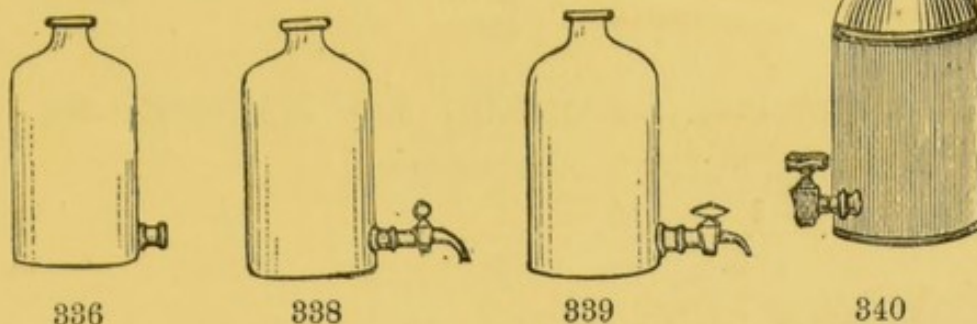
1 pint	1 quart	$\frac{1}{2}$ gall.	1 gall.	2 gall. capacity
6d.	7d.	1/	1/6	2/6 each

224 334 " Stoneware. Capacity $\frac{1}{2}$ gallon, each 8d.

"	"	1	"	"	1/
"	"	2	"	"	1/6

225 335 " Stoneware, covered with Wicker.

$\frac{1}{2}$	1	2	4 galls. capacity
1/6	2/	3/	5/6 each



Old
Cat.No.
226 336 **Bottles**, Bohemian Glass, with Tubulure at Bottom (*Aspirators*).
20 40 80 100 150 250 500 ozs. capacity
1/6 1/9 2/6 4/ 5/ 8/6 12/ each

226A 337 **Bottles**, German Glass, as Fig. 336.
16 20 40 60 80 100 150 250 500 oz. capacity.
1/3 1/4 1/6 2/ 2/6 3/ 4/6 7/6 10/ each

227 338 **Bottles**, Bohemian Glass, with Glass Stopcock ground in at Bottom.
20 40 80 100 150 250 500 ozs. capacity
4/ 5/ 7/ 8/ 10/ 14/ 18/ each

227A 339 **Bottles**, German Glass, with Glass Stopcock ground in at Bottom.
20 40 60 80 100 150 250 500 oz. capacity
3/6 4/3 4/9 5/ 5/6 7/6 9/ 15/ each

228 340 **Bottles**, Stoneware, with Stoneware Stopcock ground in at Bottom.
Capacity 2 4 6 10 20 gallons.
7/6 9/6 12/6 25/ 35/ each.

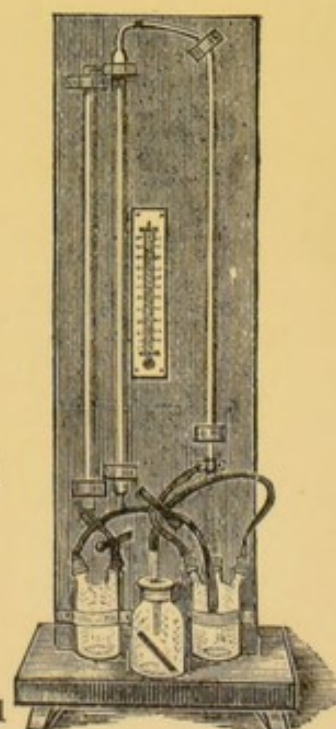
Bunsen's Burners. See "*Lamps, Bunsen's.*"

Burettes See "*Graduated Instruments.*"

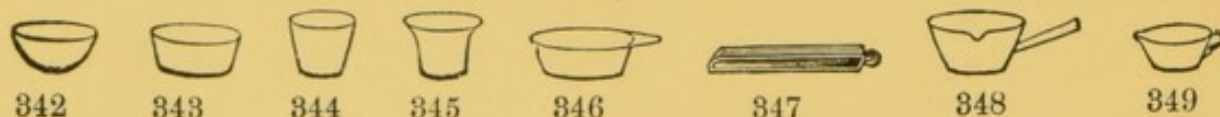
228A 341 **Calcimeter, Schiebler's**, for the quantitative estimation of Carbonate of Lime. On Stand, complete £2 12s. 6d.

Spare Bottle, with Stopper and Stoppered Tube,
each 2/6

Spare India Rubber Bladder, each 2/6.



341



Capsules, Porcelain, for Ignition, &c.

Old
Cat.No.

229 342 Capsules, Berlin Porcelain, for ignition—

1	1 $\frac{5}{8}$	1 $\frac{3}{4}$	2	2 $\frac{3}{8}$	2 $\frac{5}{8}$ in diam.
3d.	5d.	6d.	8d.	10d.	1/ each.

230 343 Capsules, Dresden Porcelain— $\frac{1}{4}$ oz. $\frac{3}{4}$ oz. capacity.
3d. 6d. each.

231 344 „ „ Conical form (Plattner's), diam., 1 $\frac{1}{2}$ in., 5d. each.

232 345 „ „ Porcelain (Plattner's. Digester)—
1 $\frac{3}{4}$ in. 2 $\frac{1}{4}$ in. diam. at top.
6d. 8d. each.

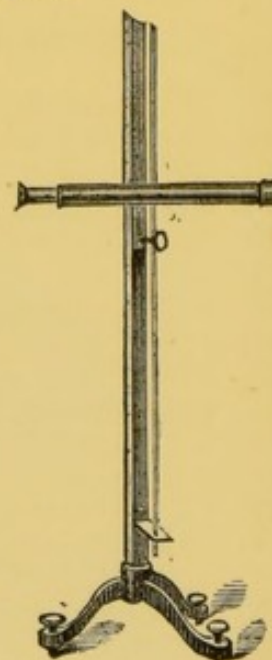
233 346 „ „ Platinum per oz. weight, Troy, 38/, 1 oz. capacity being about $\frac{1}{2}$ oz. weight. Capsules weighing less than 1 oz. are charged more in proportion to allow for cost of manufacture.

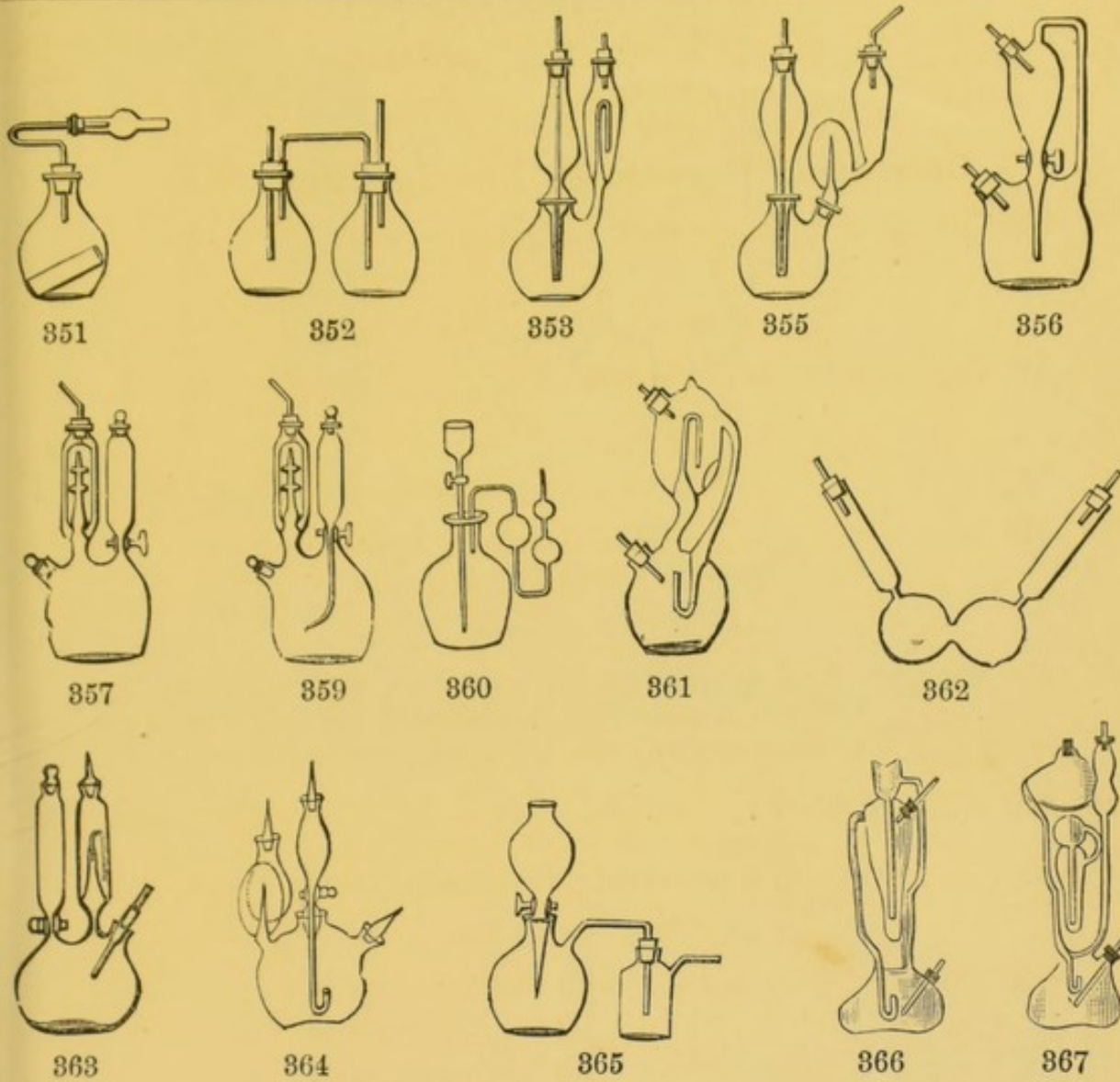
234 347 „ „ Dresden Porcelain, Boat Form (Combustion Boats), for igniting in Combustion Tubes.
3 in. \times $\frac{1}{2}$ in. 3 in. \times $\frac{5}{8}$ in. 3 $\frac{1}{2}$ in. \times $\frac{3}{4}$ in.
3d. 4d. 6d. each.

235 348 „ „ Berlin Porcelain, with Handle and Spout—
1 oz. 2 oz. 5 oz. 8 oz. capacity.
10d. 1/ 1/3 1/9 each.

236 349 „ „ Dresden Porcelain, with Ring Handle and Spout—
 $\frac{1}{2}$ oz. 2 $\frac{1}{2}$ oz. 6 oz. 13 oz. 26 oz. capacity.
7d. 8d. 1/ 1/6 5/6 each.

236A 350 Cathetometer.—For observing the height of the Mercury in Barometers, Eudiometers, Gas, Tubes, &c., at a distance—Telescope, with Micrometer and Stand complete—
£3 10/ and £8.

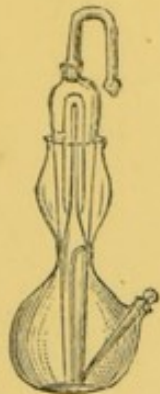




CARBONIC ACID APPARATUS

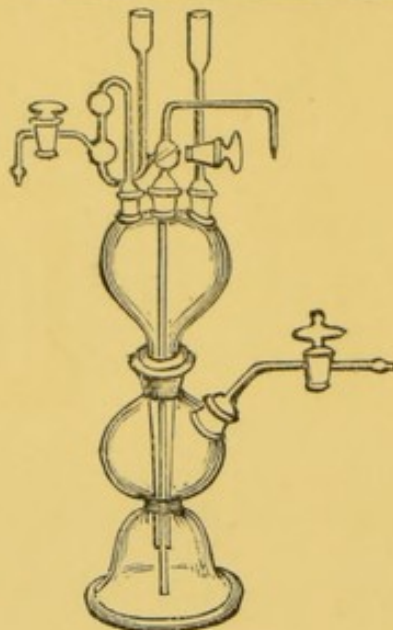
For the Estimation of Substances containing Carbonic Acid.

Old Cat.No.											
237	351	Parnell's	...	...	...	...	...	...	each	£0	1 3
238	352	Fresenius & Wills	...	...	...	...	...	...	0	1 0	
239	353	Geissler's	...	...	...	...	...	...	0	4 0	
239A	354	„ Stopped	...	...	...	...	...	...	0	5 0	
240	355	Geissler & Erdmann's	...	...	...	...	...	...	0	4 6	
241	356	Kipp's	...	...	...	...	...	...	0	4 0	
242	357	Schrotter's	...	...	...	...	...	...	0	4 0	
242A	358	„ Stopped	...	...	...	...	...	...	0	4 6	
243	359	„	...	...	...	...	...	...	0	4 0	
244	360	Townson's	...	...	...	...	...	...	0	3 6	
245	361	Rose's	...	...	...	...	...	...	0	3 6	
246	362	Fritsche's	...	...	...	...	...	...	0	0 10	
247	363	Geissler's, Stopped	...	...	...	...	...	...	0	5 0	
248	364	Rohrbeck's, Stopped	...	...	...	...	...	...	0	4 6	
249	365	Kipp's	...	...	...	...	...	...	0	4 6	
1597	366	Geissler's	...	...	...	...	...	...	0	4 0	
1598	367	„	...	...	...	...	...	...	0	4 6	

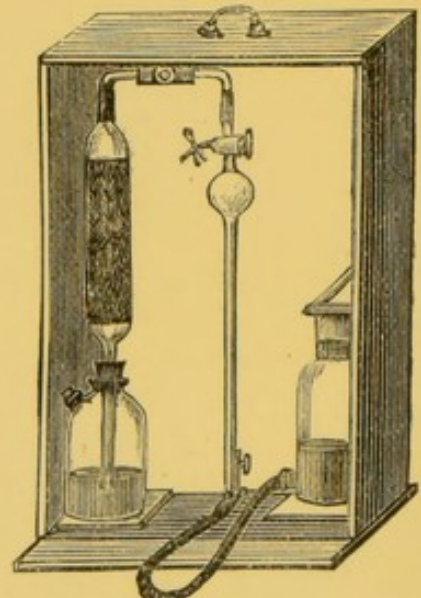


368

Old
Cat.No.



369

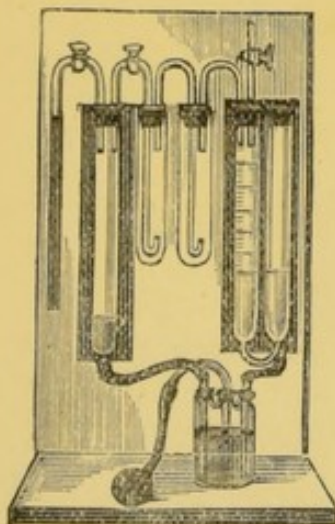


370

368 Carbonic Acid Apparatus, Geissler's, with improvement by Cochins, Tube inside being turned can be closed or left open £0 5 0

1599 369 ,, Muencke's 1 10 0

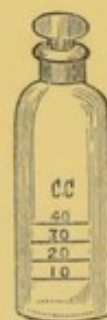
1600 370 ,, Winkler's, in Wood Case complete 2 5 0



371



372



373

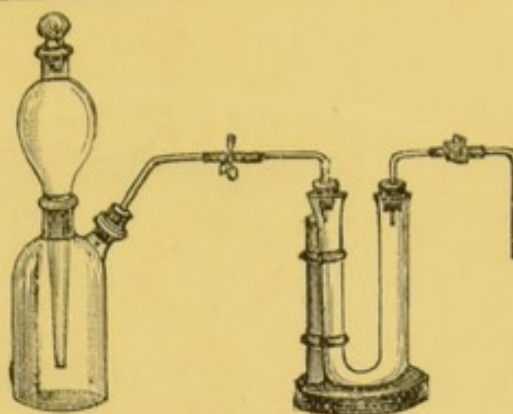
1601 371 Sidersky's Apparatus, for estimation of Carbonic Acid in saturation, on Stand £2 0 0

1602 372 Schuman's Apparatus, to estimate the Specific Weight of Cement 0 5 0

1603 373 Hydrotimeter, Boutron and Boudet, for the estimation of Chalk in Water 0 6 0



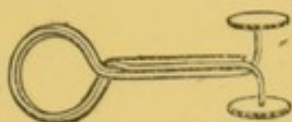
374



375

Old
Cat.No.

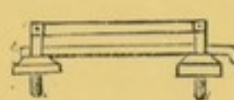
249A	374	Carbonic Acid Apparatus for the collection of Carbonic Acid Gas from Spirit Lamp, &c.	£0	2	0
249B	375	For Constant Supply, capacity of Lower Flask and Upper Bulb about 1 litre, U Tube 8 in. × 1 in., complete with Stand	0	10	6



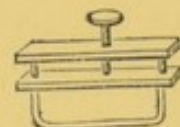
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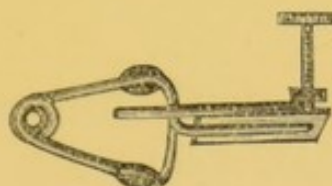
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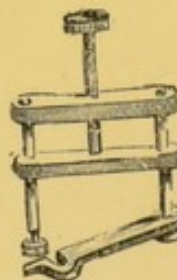
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380



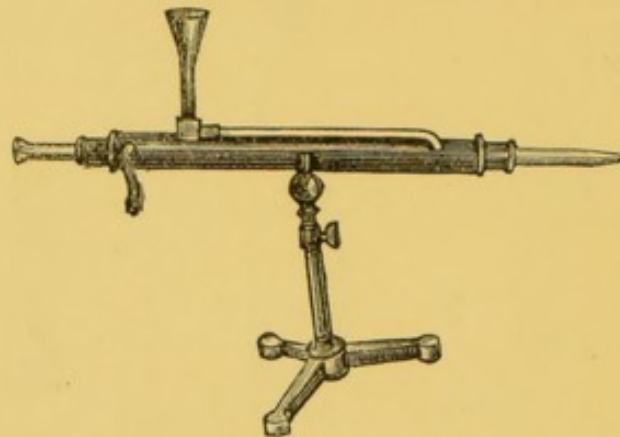
381



382

250	376	Clips, for Mohr's Burettes	per doz.	£0	4	0
251	377	„ „ „ extra strong	each	0	0	8
252	378	„ „ „ Brass, with Screw... ..	„	0	0	8
253	379	„ Bunsen's	„	0	1	0
254	380	Clamp, with Screw, for Connections, &c., Improved with Double Centre Bar—				
		$\frac{3}{4}$ in. $\frac{7}{8}$ in. 1 in. $1\frac{1}{8}$ in.				
		8d. 9d. 10d. 1/ each				
254A	381	„ Brass, for India Rubber Tube, with flat Brass Plate and Screw		0	1	0
254B	382	„ for India Rubber Tube, the bottom part with hinge, enabling the removal without unscrewing.				
		$\frac{1}{2}$ in. $\frac{3}{4}$ in. $\frac{7}{8}$ in. 1 in. inside				
		Nickel Plated 1/ 1/3 1/6 1/9 each				

Chloride of Calcium Tubes. See "Tubes for Organic Analysis."



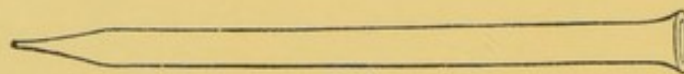
383



386



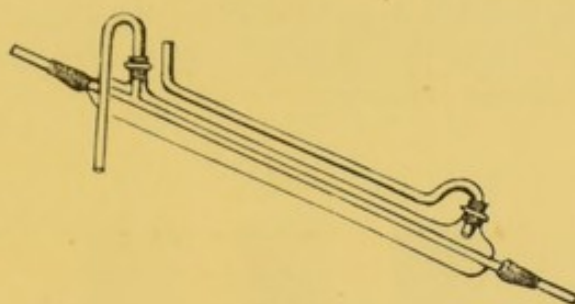
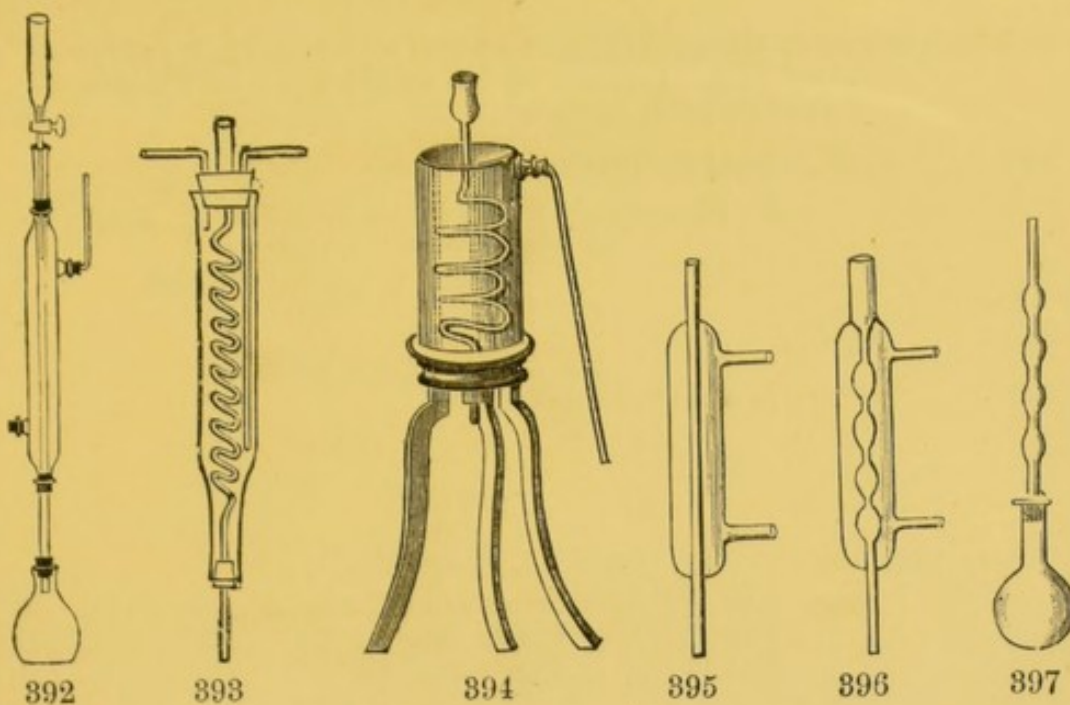
388



390

Condensers, Glass, &c., for use with Retorts in the Distillation of Alcohol, Acids, &c.

	Old Cat.No.								
	255	383	Condenser, Liebig's, Copper, Japanned Body, length 18 in., with Glass Tube, on Iron Tripod Foot, for the Distillation of Spirits, Water, &c., with Joint and Brass Telescope Slide, Glass Tube 38 in. long by $\frac{7}{8}$ in. diam., complete	...	...	...	...	...	£0 15 0
	256	384	Do. do. Body 24 in., Glass Tube 38 in. by $1\frac{1}{8}$ in., each						1 1 0
	257	385	Do. do. Body 18 in., Tube 38 in. by $\frac{7}{8}$ in., same construction as above, but without Telescope Slide, complete	...	...	...	...	...	0 12 6
	258	386	Condensers, Liebig's Glass Body and Tubes—						
			Length of Body	12	15	18	21	24	28 in.
			Diam. ...	$1\frac{1}{2}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2	2 in.
			Diam. Tube, ...	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{5}{8}$ in.
				2/6	2/9	3/	3/6	4/6	5/6 each.
	259	387	Glass bodies only for the above, 1/3 1/6 1/9 2/ 2/9 3/6 each.						



391

Old Cat.No.		Condensers, Dr. Graham's German Hard Glass—Diameter of outer Tube 1 inch. 30 inches long, fitted with bent inner Tube, Corks, and Adapter, complete ... each				£	s	d
260	388					0	3	0
261	389	Do. do.	fitted with India Rubber Corks			0	4	6
262	390	„	Tubes, Glass for Liebig's Condensers—					
		Length	38	38	38	38	in.	
		Diam.	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	in.	
			1/2	1/3	1/6	2/	each.	
1604	391	„	Liebig's, modified by Cloez—					
		Body	15	18	21	in.		
			3/	3/6	4/	each.		
263	392	„	Anthraquinone, complete ...	...	...	...	each	0 6 6
264	393	„	Glass Spiral Worm enclosed in outer Glass Tube, for fractional distillation—					
		Size of Outer Tube	6 × 1	8 × 2	9 × 2½	10 × 3	in.	
			2/	2/6	3/	4/	each.	

Old
Cat No.

264A 394 **Condensers, Glass Worm**, diameter of Worm $2\frac{1}{2}$ in., outer
Glass Vessel diameter $3\frac{1}{2}$ in., height 9 in., on Wooden
Tripod Support, complete £0 12 6

1605 395 ,, for fractional distillation—

10	12	16 in. long
2/	2/6	3/ each

1606 396 ,, Allehn's 3/ 3/6 4/ ,,

1607 397 ,, for liquids at high temperature—

2	4	6	8 oz.
1/9	2/	2/6	3/6 each.

265 398 **Corks**, finest quality, picked for Chemical purposes—

Diam. $\frac{1}{2}$ to $\frac{5}{8}$ in., for Combustion Tubes, &c., per gross	0	4	0
,, $\frac{3}{4}$ to $\frac{7}{8}$,, ,, Flasks, &c.	0	8	0
,, 1 to $1\frac{1}{4}$,, ,, Apparatus, &c.	0	12	0

266 399 ,, Shives, best white, and Bungs for Bottles and Jars,

Diam. 1 to $1\frac{1}{4}$	1 $\frac{1}{2}$ to $1\frac{3}{4}$	2 to $2\frac{1}{2}$	2 $\frac{1}{2}$ to $2\frac{3}{4}$	3 to $3\frac{1}{2}$	3 $\frac{1}{2}$ to 4 in.
6d.	1/	2/	3/6	5/	7/ per doz.

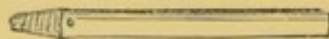


400

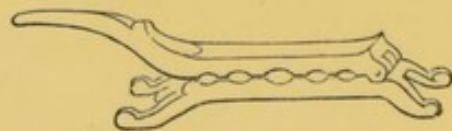
267 400 **Corks**, Caoutchouc, solid or with one or two holes—

Diam.—

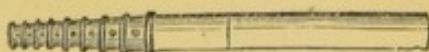
1/2	5/8	3/4	7/8	1	1 1/8	1 1/4	1 3/8	1 1/2	1 5/8	1 3/4	2	2 1/4	2 1/2	2 5/8	2 3/4 in. small end
3d.	3d.	4d.	4 1/2 d.	5d.	6d.	7d.	8d.	10d.	11d.	1/1	1/6	2/	2/6	3/3	4/ each



401



405



402



407

268 401 **Cork Borers**, of Brass Tube, and Steel Rod—

In sets	2	3	4	6	9	12
10d.	1/2	1/6	2/3	4/	5/6 per set	

Old
Cat.No.

269 402 Cork Borers, Superior and Stouter Make, in Cases—

In Sets	3	4	6	9	12
	1/6	2/	3/6	6/	7/6 per set

269A 403 ,, With Steel Ends, best, with Steel Rod, in Japanned Tin Case.

Sets	3	6	9	12
	5/	10/	15/	20/ per set

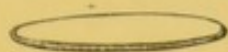
1595 404 ,, Best Nickel-Plated, in Cases.

Sets	3	4	6	9	12
	1/9	2/	3/	5/6	7/6 per set

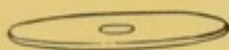
270 405 Cork Pressers, Japanned Iron each £0 1 9

406 ,, ,, Large size ,, 0 3 6

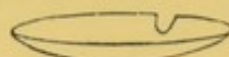
780A 407 Cork Borer Sharpener ,, 0 2 0



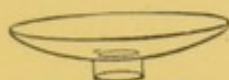
408



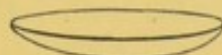
409



410



411



412

271 408 Covers for Beakers, Gas Jar, &c., ground on one side.
(Glass Circles or Plates.)

2½	3	3½	4	4½	5	6	7	8	9 in. diam.
8d.	9d.	1/	1/3	1/6	2/	2/6	3/	4/	6/ per doz.

272 409 Covers, Flat Ground Glass for Beakers, with hole in centre for Stirring Rod.

3	3½	4	4½	5 in. diam.
3/	4/	4/6	5/	5/6 per doz.

271B 410 ,, Concave Do with slit at the side—

3	3½	4	4½	5 in. diam.
5/6	6/6	6/6	7/6	8/ per doz.

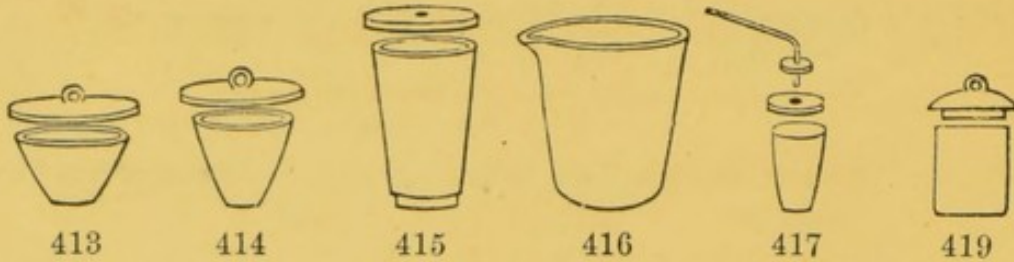
271c 411 ,, Bohemian Glass, with Ground Edge for Beakers, &c., with Neck in centre to support Funnel—

Diam. 4 in. 6d. 5 in. 8d. 6 in. 10d. each.

272 412 ,, Concave, for Beakers, &c., (Clock Glasses)—

3	3½	4	4½	5	6	7	8	9 in. diam.
2/6	3/	3/6	4/	4/6	5/	6/	7/	8/ per doz.

Covers, Concave, White Glass, thin, with Ground Edge. See "Watch Glasses."



CRUCIBLES, PORCELAIN.

Old
Cat.No.

273 413 Crucibles, Berlin Porcelain, with Cover—

No.	000	00	0	1	2	3	4	5
	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{3}{4}$	$1\frac{1}{2}$	2	$4\frac{1}{2}$	8 oz. capacity
	1	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$2\frac{5}{8}$	$3\frac{1}{4}$	$3\frac{3}{8}$ in. diam.
	3d.	4d.	6d.	8d.	10d.	1/	1/2	1/4 each

274 414 Crucibles, Meissen (Dresden) Porcelain, with Covers—

Nos.	9	8	7	6	5	4	3	2	1
	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{3}{4}$	1	$1\frac{1}{4}$	$2\frac{1}{2}$	$3\frac{1}{2}$	5	8 oz. capacity
	4d.	4d.	5d.	6d.	7d.	9d.	1/	1/1	1/4 each

275 415 Crucibles, Berlin Biscuit Porcelain, with Cover—

Capacity $1\frac{1}{2}$ oz., 7d. 2 oz., 8d. each

276 416 „ Berlin Biscuit Porcelain, no Cover, for Nitrate Silver—
Capacity 20 ounces each £0 1 3

277 417 „ Berlin Biscuit Porcelain, with Cover and Leading Tube
(Rose's) each 0 4 6
Crucible and Cover 8d. ; Tube with Flange, 4/.

278 418 „ Dresden Porcelain Crucible, Cover and Tube, complete 0 2 0

279 419 „ Berlin Porcelain, Cylindrical form, with Cover—
Capacity $\frac{1}{2}$ oz., 8d. $1\frac{1}{2}$ oz. 10d. each



280 420 Crucibles, Assay, English Fine Clay, for Gold Assay, &c.—

$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	2 in. high
$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{1}{4}$ in. diam.
2/6	2/6	2/6	2/6 per doz.

Old
Cat.No.

281 421 Crucibles, Assay, French Clay, for Gold Assay, same form as Fig. 420—
 $1\frac{1}{4}$ inch high, 8/3. $1\frac{1}{2}$ inch high 4/ per doz.

282 422 „ London Round Fire Clay—

Nos.	1	2	3	3½	4	4½	5	5½	6	6½	7	8	9	10
Height	2¾	3	3½	3¾	4	4½	5	5½	6	6½	7	8	9	10 inches
	8d.	10d.	1/2	1/6	1/9	2/4	3/	3/6	4/	6/	7/	9/	12/6	18/ per doz.

283 423 Crucible Covers, London Clay, for the above ; DOME FORM—

Sizes to fit Nos.	1	2	3 & 3½	4 & 4½	5 & 5½	6 & 9	10
	1/	2/	2/6	3/	4/	6/	7/ per doz.

284 424 Ditto, ditto ; FLAT FORM—

Sizes to fit Nos.	1 & 2	3	3½ & 4	4½	5	5½ & 6	6½	7 & 8	9 & 10
	8d.	1/	1/3	1/6	1/9	2/4	3/	3/6	4/6 per doz.



425



426



427

285 425 Crucibles, true Cornish Clay, Metallurgists, for Copper, &c.—

Height	2	3	4	5	6	7 in.
	10d.	1/2	1/9	3/	4/6	7/ per doz.
Nests of 4, largest 4 in. high,	5/3	per doz. nests				
„ 5	„ 5	„ 7/6	„			

285A 426 Battersea Round Clay Crucibles—

No.	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R
	2¾	3	3½	4	4½	5	5¾	5¾	6¾	7¼	8	8½	9¾	10	11	12	13 in. high
	1¾	1¾	2¼	2¾	2¾	3	3¾	3¾	4¾	4¾	5¼	5¼	6½	7	7¾	8¾	9¾ in. diam.
	6d.	7d.	10d.	1/	1/6	1/8	2/3	2/4	3/6	3/9	6/	7/6	10/	15/	17/	20/	27/ per doz.

Old
Cat.No.

285B 427 Patented Salamander Crucibles are not affected by Moisture or Frost and require no annealing. Each number contains about 2 lb. (English) of metal—

No. ...	1	2	3	4	6	8	10	12	16	20
Height	$2\frac{7}{8}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{3}{4}$	$6\frac{1}{4}$	$7\frac{1}{8}$	$7\frac{1}{4}$	8	9 in.
	4d.	8d.	1/	1/3	2/	2/6	3/	3/9	5/	6/6 each

Salamander Covers $1\frac{1}{2}$ d. per number each.



428



429



430



434

286 428 Crucibles, Hessian Clay—Triangular—

Height	$2\frac{1}{8}$	$2\frac{5}{8}$	$3\frac{1}{2}$	$4\frac{1}{2}$ inches
	7d.	10d.	1/4	2/6 per doz.

Nests of 4 above sizes, per doz. nests 5/.

288 429 Fluxing Pots, Battersea Fine Clay, similar to French—

No. ...	0	1	2	3	4	5	6	7	8	9	10	12
Height	2	$2\frac{1}{8}$	$2\frac{3}{8}$	$2\frac{3}{4}$	$3\frac{1}{8}$	$3\frac{1}{2}$	$3\frac{7}{8}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{2}$	$5\frac{7}{8}$	$7\frac{1}{4}$ in.
Diam.	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	2	$2\frac{1}{8}$	$2\frac{1}{2}$	$2\frac{5}{8}$	$2\frac{7}{8}$	$3\frac{1}{8}$	$3\frac{3}{4}$ in.
	6d.	8d.	10d.	1/	1/3	1/6	1/8	2/	2/6	3/	3/6	6/ per doz.

289 430 Crucibles, Patent Plumbago. Superseded by Salamander, and same price.

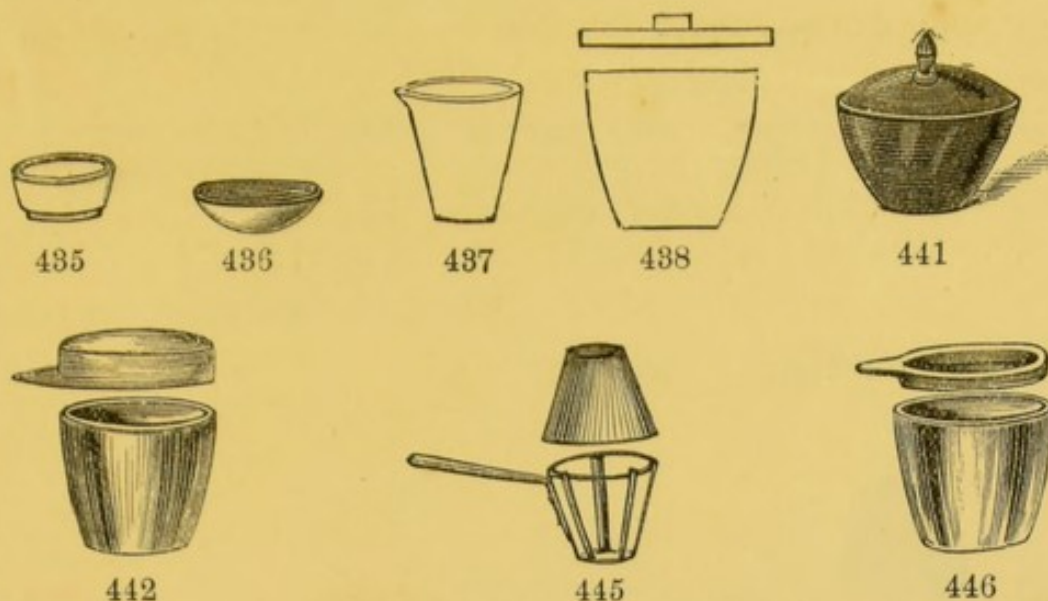
289A 431 .. Covers for ditto $1\frac{1}{2}$ d. per number.

290 432 .. Stands to support Crucibles, $1\frac{1}{2}$ d. per number.

290A 433 .. Clay Stirrers per doz. £0 15 0

291 434 .. Clay (Skittle Pots)—

Height	3	4	5	6	8	10	12 in.
	1/9	2/3	3/	3/6	5/	8/6	15/ per doz.



Old
Cat.No

292 435 Clay Scorifiers—

Diameter	1 $\frac{1}{4}$	1 $\frac{1}{2}$	2 & 2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$ inches
	6/	6/6	7/6	8/	10/	12/	14/6 per gross

293 436 „ Roasting Dishes—

Diameter	2 $\frac{1}{2}$	3	4	5 inches
	1/6	1/9	2/3	2/6 per doz.

294 437 Crucibles, Iron—

Height 3 in., 10d. 4 in., 1/. 5 in., 1/6 each.

295 438 „ Iron, with Cover—

Height 2 in., 8d. 2 $\frac{1}{4}$ in., 10d. 3 in., 1/3 each.

296 439 „ Iron. Nest of 3, with Covers as above per nest £0 2 6

296A 440 „ „ Wrought, 4 inches each 0 4 0

296B 441 „ Stout Sheet Iron, with Covers—

Height	2 $\frac{1}{2}$	2 $\frac{3}{8}$	2 $\frac{3}{4}$	3 $\frac{1}{4}$ inches
Diam.	3	3 $\frac{1}{2}$	4 $\frac{1}{2}$	4 $\frac{3}{4}$ inches
	1/8	1/10	2/	2/6 each

297 442 „ Platinum, capacity one ounce, being about one ounce weight per ounce 1 18 0

Crucibles weighing less than one ounce are charged at 40/ per oz., to allow for cost of Manufacture.

Old Cat No.							
298	443	Crucibles, Pure Silver	per ounce	£0	14	0	
299	444	„ „ Gold	„	5	10	0	
300	445	„ Jackets, Sheet Iron to protect Crucibles over Lamp	per pair 1/2 and	0	1	6	
1591	446	„ Nickel, Polished, with Cover—					
				1 ³ / ₈	2	2 ³ / ₈ in. high	
				2/6	3/6	4/ each	

Crucible Tongs. "See Tongs."



447

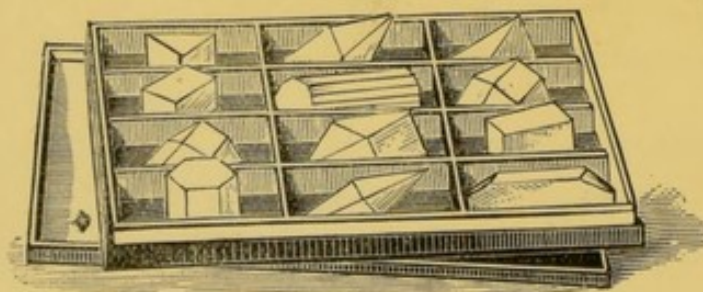


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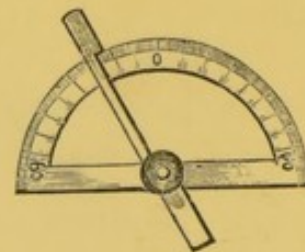


449

300A	447	Crucible Jackets, Plumbago, to protect Crucibles over Lamp	per pair	£0	2	6	
301	448	Crystal Drainers, Berlin Porcelain, Fig. 448, with two handles, or Deep Form, Fig. 449—					
				5 in. diam., 1/9.	16 in. diam., 25/.		
302	449	„ „ Meissen Porcelain, without Handles—					
		Diameter		5	11	12	13 ¹ / ₂ inches
				1/6	6/	8/	11/ each

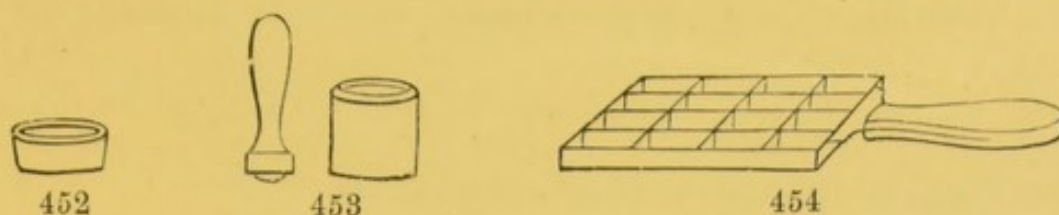


450



451

302A	450	Crystals, Glass Models of, Cut and Polished to illustrate the 6 systems of Crystallization, in strong Cardboard Case with divisions	£1	15	0
302B	451	Goniometer, for measuring the Angles of Crystals	0	7	6



Old
Cat.No.

303 452 Cupels, Best French Bone Ash—

No. ...	1	2	3	4	5	6	7	8	9	10
Diam.	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{7}{8}$	$2\frac{1}{4}$ inches
	8d.	9d.	10d.	1/	1/3	2/	2/9	5/6	8/	15/ per doz.
	5/	5/6	6/	7/	9/	15/	21/	40/	60/	100/ per hundred

Boxes containing from 100 to 500 according to size, packed in Cotton Wool, &c., 2/6 to 3/ extra.

304 453 Cupels, Moulds, Polished Steel, in 4 pieces—

Diam.	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{5}{8}$	$1\frac{3}{4}$	$1\frac{7}{8}$	$2\frac{1}{4}$ in.
	7/6	8/	9/	10/6	12/	13/	15/	16/	17/6	19/	20/6 each

305 454 Cupel, Trays, Sheet Iron, with 16 divisions £0 6 6



306 455 Dialysers, Graham's, consisting of Gutta Percha Rings and three pieces of Dialysis Paper to fit—

Diameter of Rings	6	8	10	12 inches
	2/	3/	4/	5/ each

307 456 Dialysis Paper, 20 in. × 20 in., best quality, per sheet ... £0 0 3

	$8\frac{1}{2}$	$10\frac{1}{2}$	$12\frac{1}{2}$	$14\frac{1}{2}$ inches square
	1/	1/6	2/	2/6 per doz. sheets

Old
Cat.No.

807A 457 Glass Basins, flat conical, with Spout, suitable for the above—

Diam. 9	11	13	15 in.
2/	3/	3/6	5/ each

807B 458 Dialyser, Bell shaped, Glass, with 2 Flanges—

3	4	5 in. bore
8d.	10d.	1/ each.

Parchment Papers for the above 8d., 9d., and 1/ per doz.

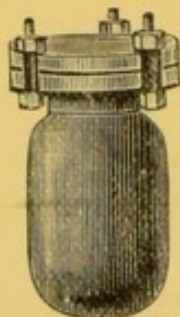
807c 459 Cylindrical Jars, without feet each 1/6, 2/, and £0 2 6



462



463



464



465

308 460 Diamonds, for writing on glass each 7/6, 10/6, 12/6 and £0 15 0

309 461 ,, Glazier's for cutting glass ... each 17/6 and 1 1 0

310 462 Digesters, Berlin Porcelain—

1½ oz. capacity, 10d. 3 oz., 1/ each

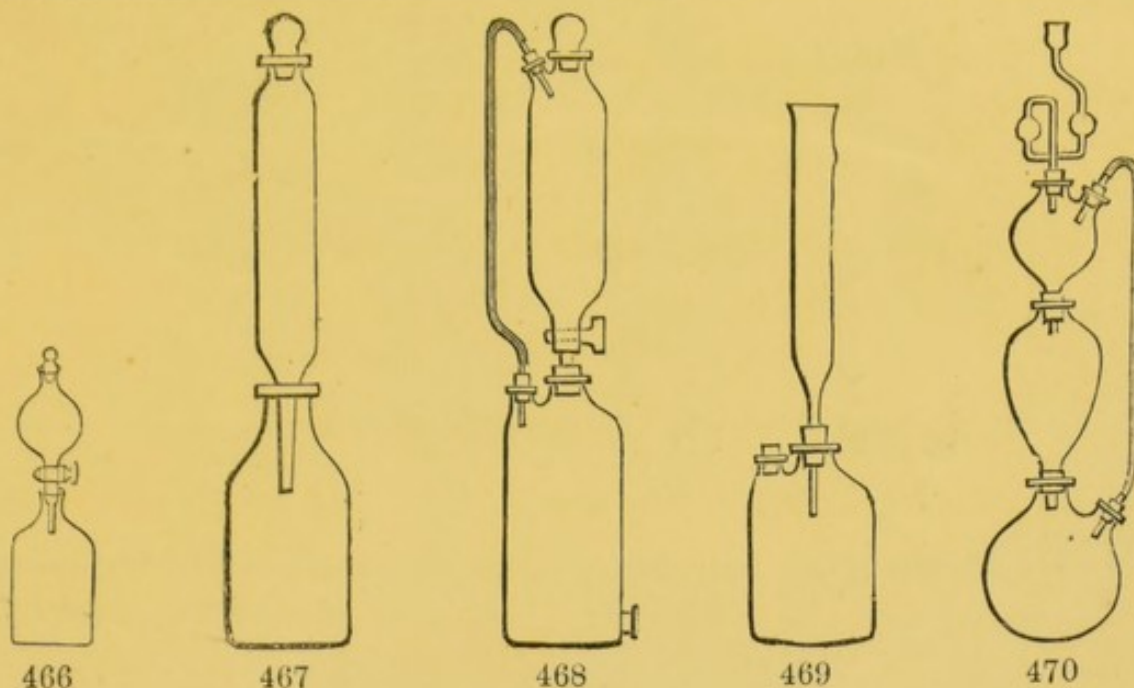
311 463 ,, Berlin Porcelain, with Porcelain Handle and Cover—

Capacity	10	18	30 ounces
	4/	5/	6/6 each

200A 464 Cast Iron Digester, enamelled inside, capacity about ½ pint £1 0 0

312 465 Dishes, Porcelain, Flat Photographic, with Lips, depth about 1 in.—

Diameter Inside—				Diameter Inside—			
5 by 4 in.	...	each	8d.	12 by 10 in.	...	...	each 2/6
6 by 5 "	...	"	9d.	13 by 11 "	...	...	" 3/
7 by 5 "	...	"	10d.	14 by 11 "	...	...	" 4/
8 by 6 "	...	"	1/	16 by 12 "	...	...	" 6/
9 by 7 "	...	"	1/3	18 by 16 "	...	...	" 10/
10 by 8 "	...	"	1/6	20 by 17 "	...	...	" 15/
11 by 9 "	...	"	1/8	24 by 19 "	...	...	" 20/
				24 by 22 "	...	...	" 30/



**DISPLACEMENT APPARATUS,
PERCOLATORS, &c.**

Old
Cat.No.

313 466 Percolator, with Glass Stopcock, Bulb ground to Neck of Flask—
Capacity of Flask 8 ozs., 3/6. 16 ozs. 5/ each.

314 467 „ Cylindrical, with hole through Funnel and Neck of Flask, for
admission of external air, best German Glass—
1' 1½ 2 pints
4/6 5/6 7/ each

315 468 „ for Ether and Alcohol Extractions, upper Cylinder
with Stopper, and Stopcock fitted to lower
vessel with cork, capacity of Cylinder about
1 pint, lower vessel about 2 pints, white glass,
complete with fittings, and Stopcock for lower
vessel £0 10 0
„ Upper Cylinder 2 pints, lower vessel 4 pints ... 0 12 0
„ 3 „ „ 6 „ ... 1 8 0
„ 4 „ „ 8 „ ... 1 12 0

316 469 „ for small quantities, Cylinder fitted with cork to
stout bottle with two necks, Cylinder about 6 in.
by ¾ in., lower vessel 5 oz. capacity, complete 0 2 0

317 470 „ Payen's, for Extractions of Alcohol or Ether, thin
glass, the bulb to be placed in Water Bath,
Capacity of lower bulb about 6 ozs. ... 0 5 0
„ „ „ 12 „ ... 0 7 6



471



472



473



474

Old
Cat.No.

317A 471 Displacement Apparatus, Bohemian Glass, with Bulb and Stopper—
10 20 35 70 120 ozs. Capacity of lower Vessel

2/3 3/ 3/6 4/ 5/ each

317E 472 2/6 3/6 4/ 4/6 5/6 ,, with tubulure at side

317F 473 Ditto, Bohemian Glass with Angular Funnel—

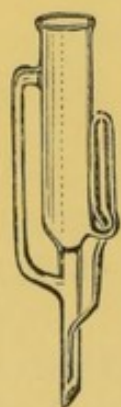
35 70 120 ozs. Capacity of lower Vessel

6/ 7/6 8/ each

317G 474 Ditto, Bohemian Glass, with stout ground Glass Cover—

35 70 120 ozs. Capacity of lower Vessel

11/ 12/6 15/ each



475



476

317B 475 Soxhlet's Fat Extraction Apparatus as used in Dr. Skalweit's
Laboratory, Hanover—

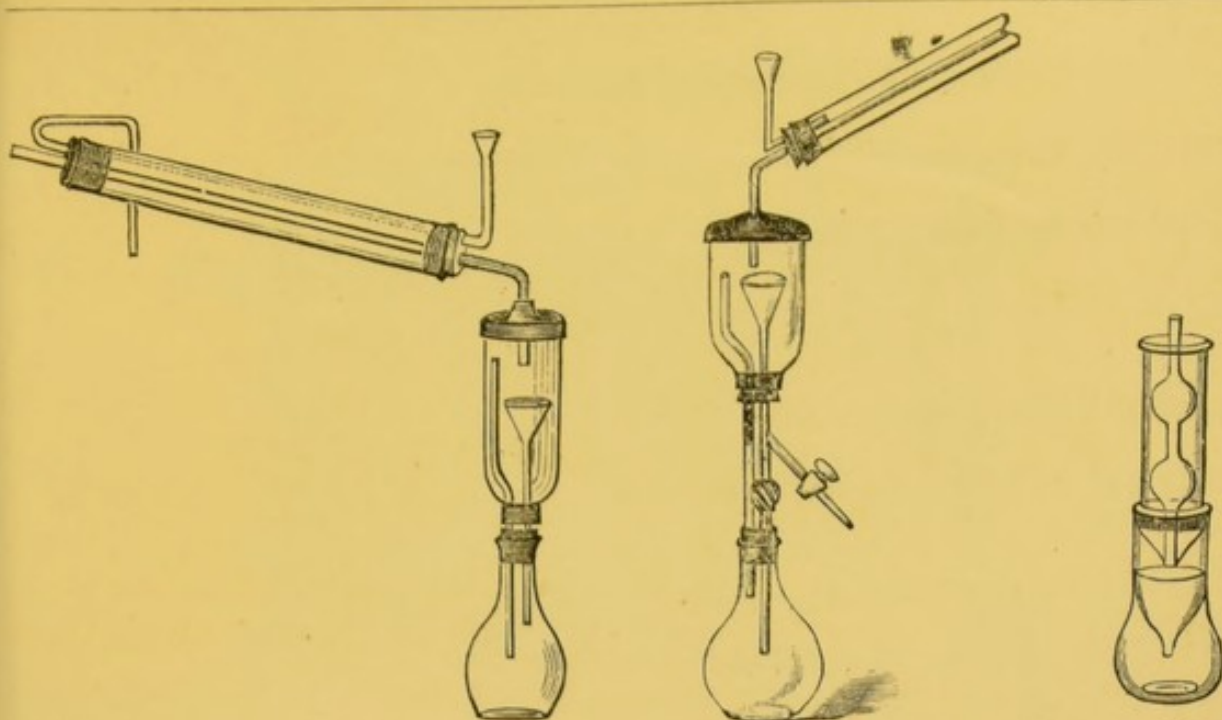
60 80 100 200 c.c.

3/ 3/6 4/6 5/6 each

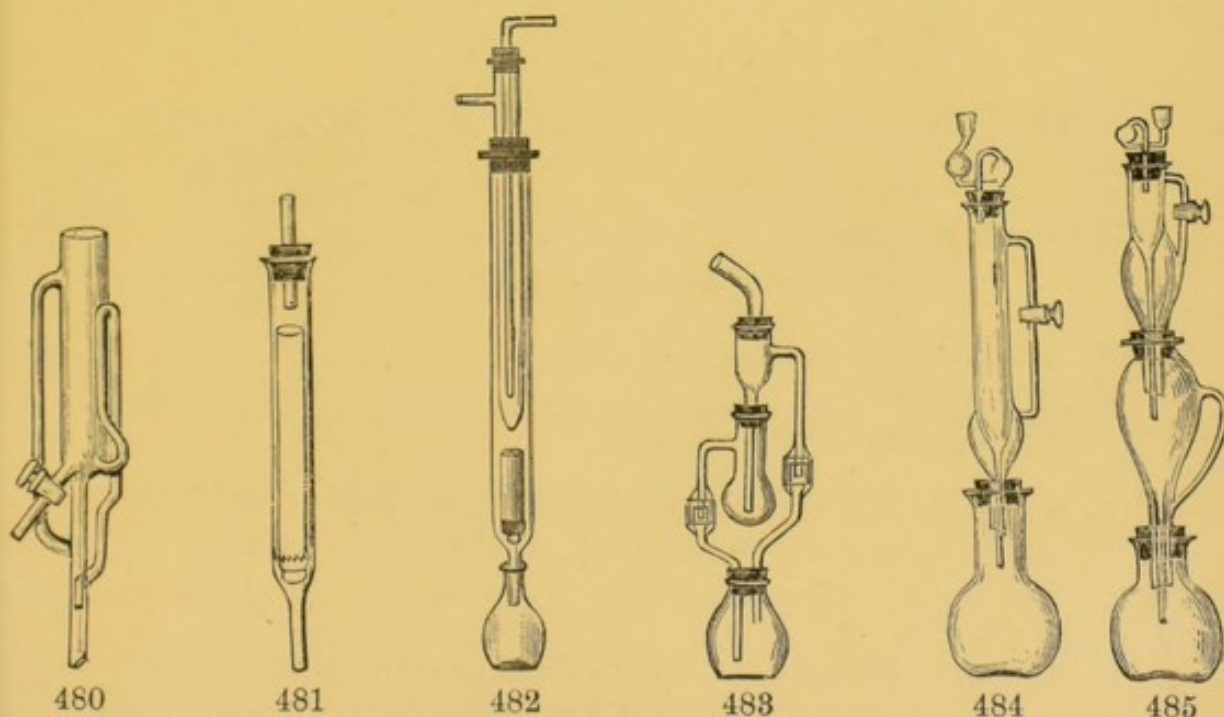
317C 476 Drechsel's Fat Extraction Apparatus—

1/4 1/2 1 litre

2/6 3/ 4/ each



Old Cat.No.	477	478	479	
317H	Angell's Fat Extraction Apparatus, for Analysis of Butter, Milk, &c....	..	..	..
				complete
				£0 10 6
317K	478	..	Improved Fat Extractor, arranged by Mr. Angell, County Analyst, Southampton. In order to condense all Vapour it is necessary to have a Condenser at least 5 feet long. Price without Condenser...	..
				1 1 0
			Glass Condenser only	..
				0 15 0
317I	479	Thorn's Apparatus, for estimation of quantity of Oil in Seeds, &c.	..	..
				0 12 0



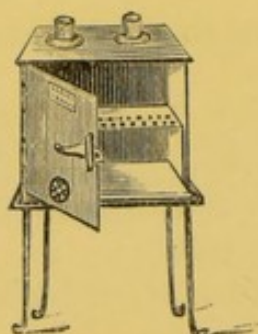
1609	480	Soxhlet's Fat Extraction Apparatus, with Stopcock—		
		60	80	100
		200 c.c. capacity		
		7/	7/6	9/
				10/6 each

Old
Cat.No.

1610	481	Tollen's Fat Extraction Apparatus	...	...	...	£0	3	0
1611	482	Kreussler's Ditto, with 3 Inner Tubes and Flask	...	...	...	0	10	0
1612	483	Schwarz's Ditto—						
		100	250	500	1000 c.c. capacity			
		6/	6/6	7/	8/ each			
1613	484	Gawalowsky's Ditto	...	...	...	0	9	0
1614	485	Ditto ditto Drechsel's form	...	...	...	0	11	0



486



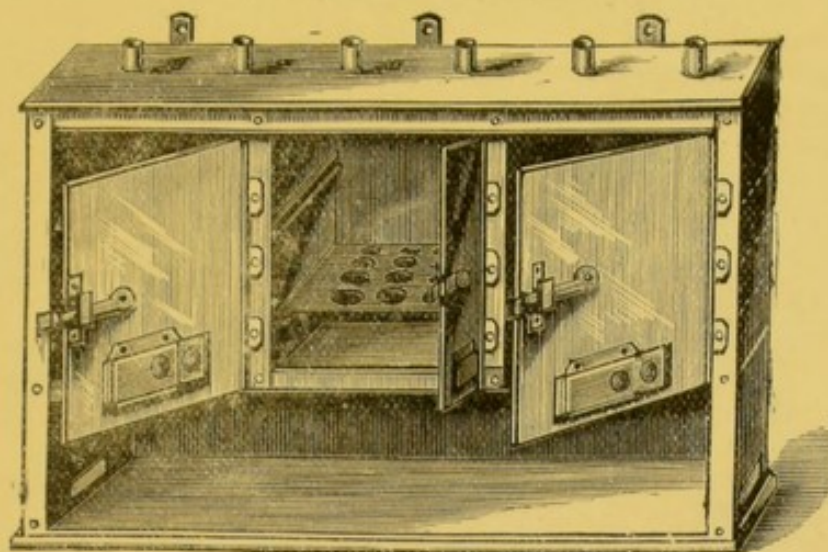
488



489

DRYING APPARATUS BY HOT AIR.

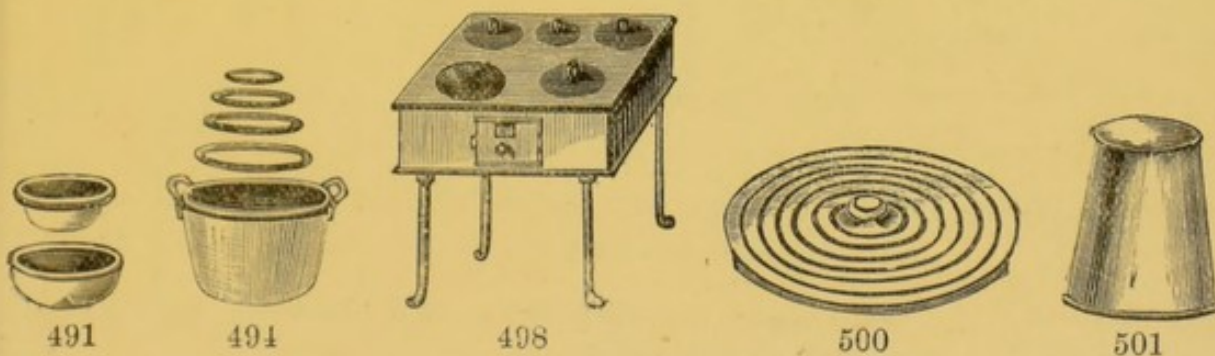
318	486	Taylor's Japanned Tin Circular Drying Oven on Legs.						
		Diameter of body, 9 in., height 4 in.	...	each	£0	10	0	
318A	487	Ditto Ditto, same size, Copper	...	...	...	1	10	0
319	488	Drying Oven, Square Copper—						
		Size, front 6½ in., front to back 6½ in., height 5 in.	each	0	15	0		
		„ 7½ in. „ 7½ in. „ 6 in. „	0	18	0			
		„ 9 in. „ 9 in. „ 9 in. „	1	5	0			
		Wrought Iron Stands Extra (See Stands).						
320	489	Rammelsberg's Copper Drying Bath, Brazed—						
		Height 6 in., Diameter, 4 in.	...	...	...	0	7	6



490

Old
Cat.No.

319A 490 Drying Oven, Copper, length $21\frac{1}{2}$ in., front to back $7\frac{1}{2}$ in., height 9 in., in three Compartments, with Shelves perforated for Crucibles, &c., on Sheet Iron Stand, total height $15\frac{1}{2}$ in. £2 10 0



491

494

498

500

501

DRYING APPARATUS BY HOT WATER.

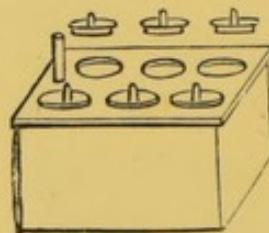
321 491 Water Bath, Berlin Porcelain—
 Capacity, inner pan, 3 oz., each £0 3 0
 " " $4\frac{1}{2}$ " " 0 3 6
 " " 6 " " 0 5 6
 321A 492 " Wedgwood Pearl Ware—
 Capacity, inner pan, 3 oz., 1/, 4 oz. ,, 0 1 6
 493 Brown Stoneware, Capacity, inner pan, 4 oz., 0 1 0

Old
Cat.No.

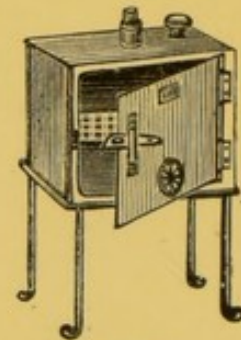
322	494	Water Bath, Copper, with 4 Rings for Basins—				
		Diameter, outer pan, 5 in.	each	£0	6	0
		" " 6 " 	"	0	9	6
323	495	" " 9 " 5 Rings	"	0	15	0
323A	496	" Deep Capacity, 2 galls., 6 Rings and Gauge ..	"	2	10	0
324	497	" Japanned Tin, Taylor's form, round, with legs, as Fig. 487	each	0	16	0
325	498	" Copper, on legs, with 3 holes for Basins, Funnel Holder, Drying Drawer and Covers 12 in. by 9½ in. by 4 in. deep	each	1	10	0
	499	" Ditto, ditto, with 4 holes	"	1	15	0
326	500	" Set Porcelain Rings, 7½ in. diam. outside, to 1⅜ in. inside, with cover	per set	0	3	6
326A	501	" Tin Plate... ..	each	0	0	8



502



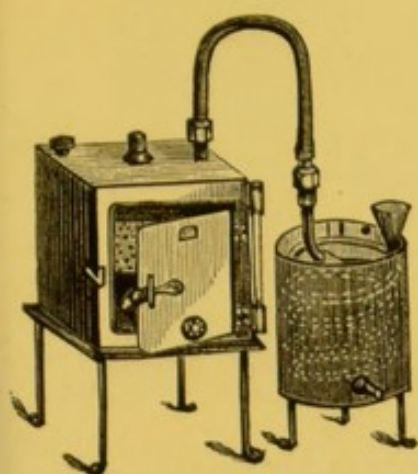
503-5



506

327	502	Water Bath, Tin Jacket, with Porcelain Basin, 12 in. diam. and Brass Stopcock, for concentrated infusions, &c., each	£0	12	6			
328	503	" Copper for Wanklyn's Milk Analysis, for Platinum Capsules, with 3 holes and Covers	0	9	6			
329	504	" Do. do. 6 do.	0	12	0			
329A	505	" Platinum Capsules, to fit, numbered	0	13	6			
330	506	Water Ovens, Copper, polished, with gauge, best make—						
		Size, front ...	5½	6½	6¾	9	14	15½ in.
		Front and back	6	6¼	7¾	9	10	12 in.
		Height ...	4½	5¼	6¼	9	10¼	14 in.
			12/6	£1 1/	£1 5/	£1 16/	£2 15/	£3 15/ each

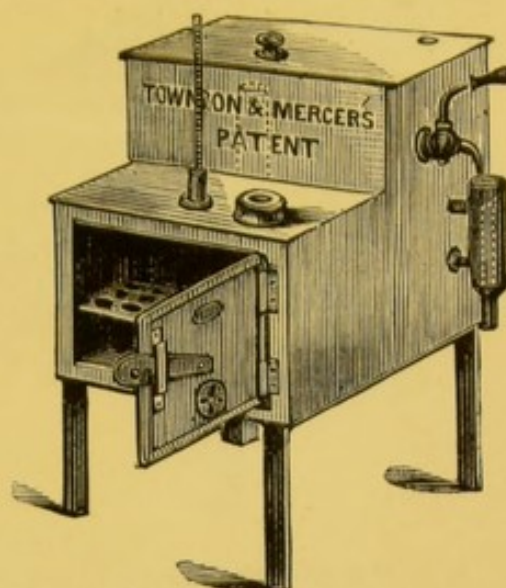
Other sizes or descriptions made to order.



507



508



511

Old
Cat.No.

330A 507 **Drying Water Oven**, Copper, with Water Gauge, Union Joint Connections and pure Tin Worm Condenser for making Distilled Water, complete with Stand—

Size, front of Oven	9 in.	Front to back	9 in.	Height	9 in.	£3	15	0
"	14 "	"	10 "	"	10 "	4	15	0
"	15½ "	"	12 "	"	14 "	6	0	0

330B 508 **Drying Water Oven**, with 3 rings for evaporating—

Size, front of Oven	9 in.	Front to back	9 in.	Height	9 in.	£2	7	6
"	14 "	"	10 "	"	10 "	3	10	0
"	15½ "	"	12 "	"	14 "	4	10	0

331 509 **Drying Ovens**, Copper for Oil, Brazed, as Fig. 506—

Size, front of Oven	5½ in.	Front to back	6 in.	Height	4¼ in.	£1	10	0
"	6⅝ "	"	6¼ "	"	5¼ "	2	3	0
"	6⅞ "	"	7¾ "	"	6¼ "	2	10	0
"	9 "	"	9 "	"	9 "	3	10	0

332 510 **Stands**, on four Legs, for the above—

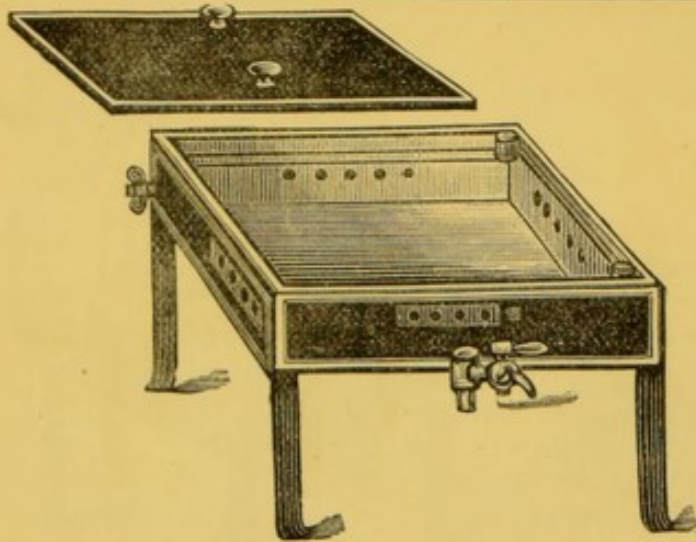
3/	3/6	4/6	5/	7/6 each
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511 **Copper Hot Water Oven**, Townson and Mercer's Patented, with Cistern for Automatic Supply of Water without lowering the Temperature of the Oven, and obviating the necessity of attention to the water supply for about 16 hours.

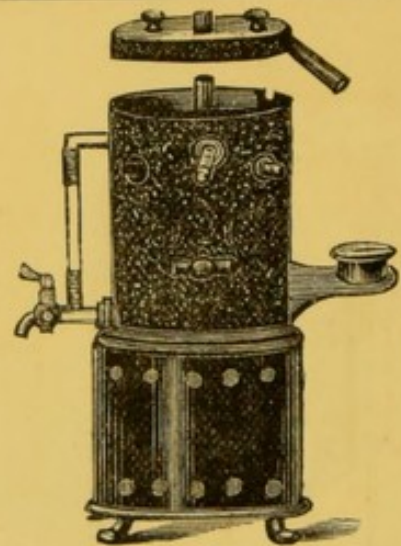
Sizes, exclusive of Cistern, best Polished Copper, with Stand—

Front ...	5½	6⅝	6⅞	9	14	15½ in.
Front to back...	6	6¼	7¾	9	10	12 in.
Height...	4½	5¼	6¼	9	10¼	14 in.
Price ...	30/	35/	40/	60/	84/	110/ each

Other Sizes made to order.



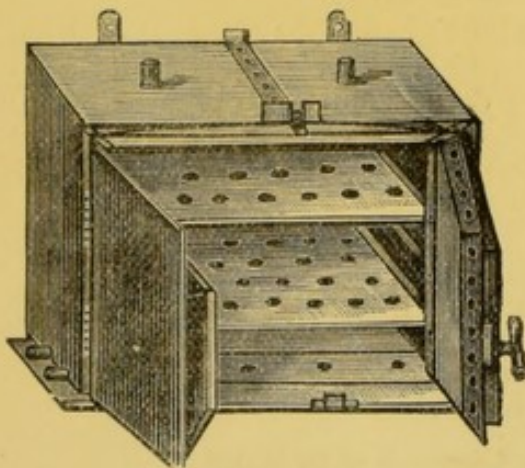
512



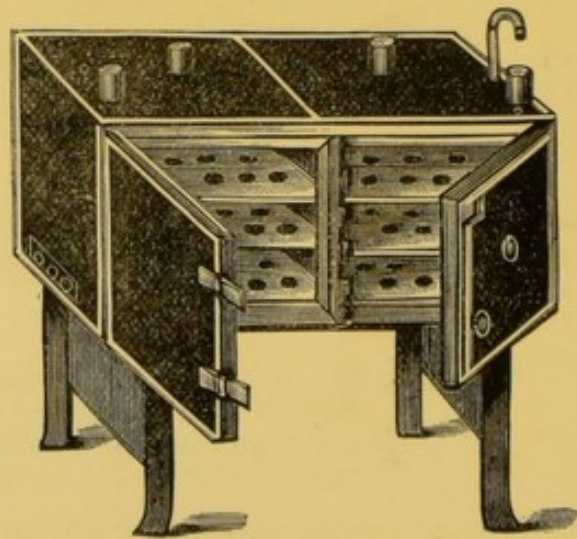
513

APPARATUS FOR THE CULTIVATION OF BACTERIA.

- 512 Serum Inspissator, Stout Tin, 18 in. by 18 in. by 4½ in. deep, with Double Walls, Copper Bottom and Glass Cover, Brass Slides for Air-holes, Brass Stopcock, Polished Brass Mounts, and covered with thick Felt, with strong Iron Stand, and sliding arrangement for required angle £2 10 0
- 513 Serum Steriliser, Jacketed Cylindrical Form, Stout Tin, 12 in. high, 10 in. diameter, Copper Bottom, fitted inside with 4 divisions and 4 Trays, containing 11 holes each ¾ in. diameter at top and ½ in. at bottom for Tubes, Water Gauge and Stopcock, Top Double Walls, with Copper Elongation, the whole covered with Thick Felt, with Sheet Iron Stand, complete ... 2 10 0
- 514 The same as above, in Strong Copper, with Sheet Iron Stand ... 3 10 0

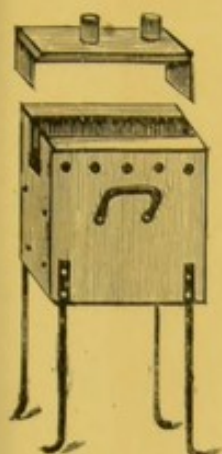


515

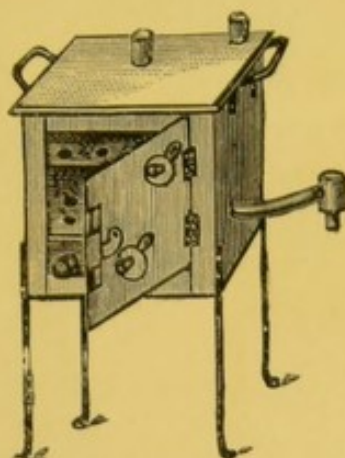


516

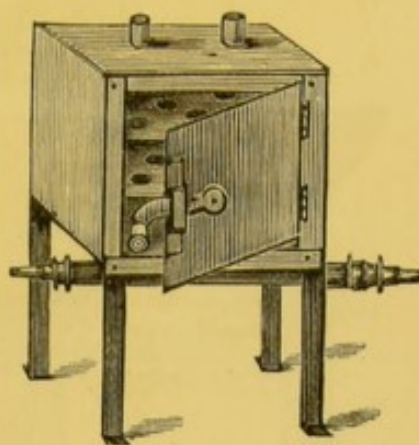
- 515 Sheet Iron Oven, Double Jacketed, 19 in. by 11 in. by 16½ in. high, with Shelves, 32 Holes in each ¾ in. diameter, Slides for Air-holes, &c., Door with Sliding Bolt £3 10 0
- 516 Sterilization Oven, 23 in. by 12 in. by 18 in. high, Sheet Iron covered with Lead, Double Jacketed, Brass Slide for Air-holes, Stopcock, Polished Brass Mounts, 4 Shelves with 30 Holes in each ¾ in. diameter, Doors with Sliding Bolts, the whole covered with stout Felt, with Strong Iron Stand ... 5 10 0



517

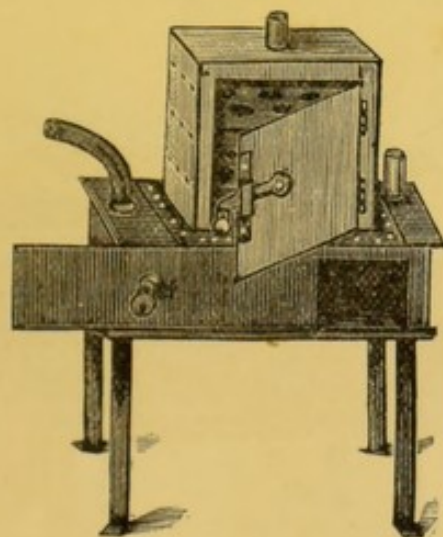


519

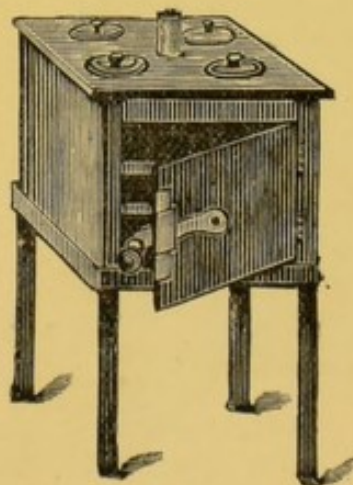


520

- 517 Copper Bath, 5 in. by 4 in. by 6 in. high, on Stand, with moveable top for 2 Tubes £0 15 0
- 518 Ditto, ditto, with Double Walls 1 0 0
- 519 Copper Water Bath, on Stand, 7½ in. by 7½ in. by 7 in., with Two Shelves, 5 Holes in each, and Water Level Arrangement 1 5 0
- 520 Copper Drying Oven, Dr. Rühdorff's, 10 in. by 6 in. by 8 in. with Two Shelves, with Holes of various sizes, on Strong Iron Stand, with S shape Gas Burner and Sliding Arrangement for moving closer or further from Oven 1 17 6

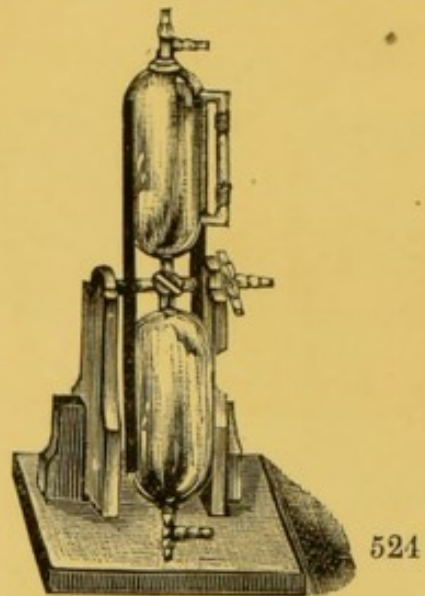
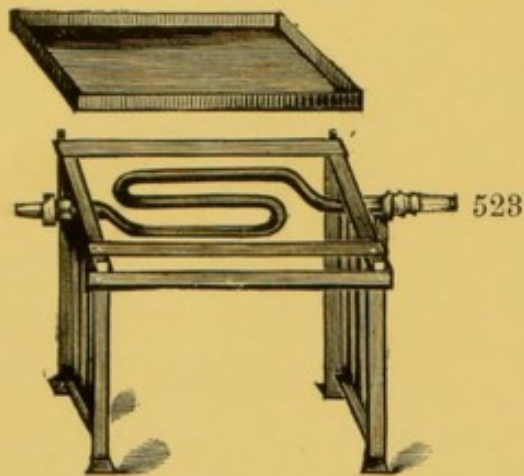


521

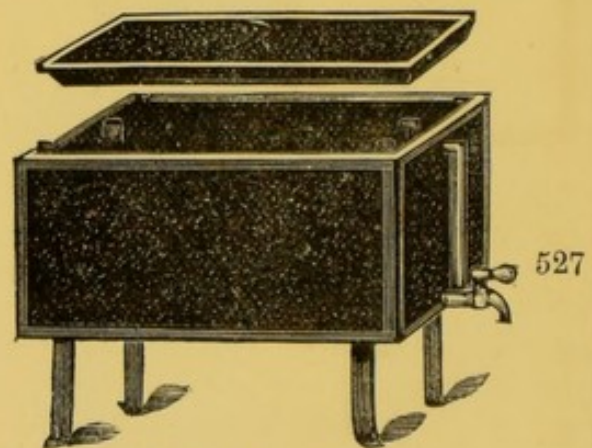
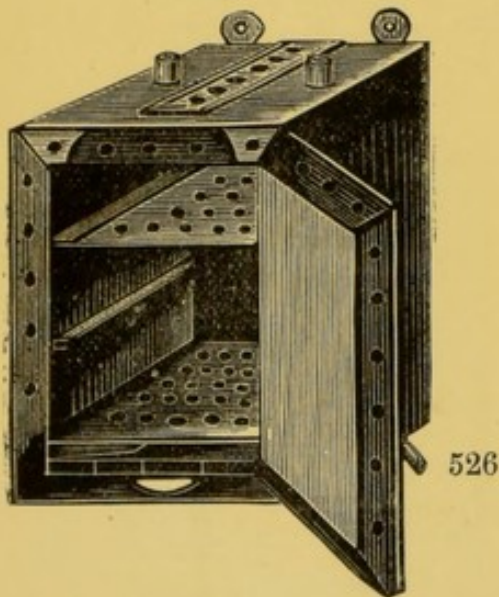


522

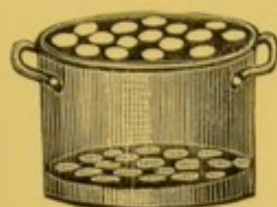
- 521 Copper Drying Oven, on Iron Stand, upper portion 6 in by 5½ in. by 5 in., with Shelf, 9 Holes ¾ in. diameter; the lower part 9 in. by 5½ by 4 in.; partition in centre and partially Jacketed inside, with outlet Tubes top and bottom and Sliding Door £2 0 0
- 522 Copper Water Bath, with 4 Holes at top, 3 Rings various sizes and covers to each, outside measure 8 in. by 8 in. by 8 in., internal dimensions of Oven, 6¾ in. by 5¾ in. by 5¾ in., with 3 Tubes ¾ in. diameter passing through centre, with Strong Iron Stand 1 10 0



- 523 Iron Sand Bath, Rühdorff's, moveable Tray, 10 in. by 6 in. by $\frac{3}{4}$ in. deep, on Strong Iron Stand, with S form Gas Burner, arranged for raising or lowering £0 15 0
- 524 Muencke's Aspirator, Japanned Zinc, about 1 gallon capacity, Brass Polished Fittings, on strong Polished White Wood Stand 3 10 0
- 525 Micro Gas Burner, on Tripod Stand, with Slide, three burners 1 0 0



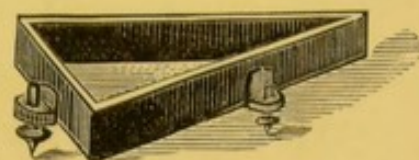
- 526 Sterilising Oven, Copper, Double Walls, 11 in. by 10 in. by 16 in. high; Inner Chamber 9 in. by 8 in. by $11\frac{1}{4}$ in. high, with two Shelves perforated, Sliding Ventilator at Top and two Apertures for Thermometer and Gas Regulator £3 10 0
- 527 Cultivating Trough, Sheet Iron, lined with Lead, 24 in. by 14 in. by 12 in., Double Walls, Water Gauge and Stopcock, and Strong Glass Cover, Isolated Inner Chamber of strong Sheet Zinc. 19 in. by 10 in. by $9\frac{3}{4}$ in. inside measure, provided with arrangement for equal circulation of Warm Air, the whole covered with Thick Felt and fitted with Brass Polished Mounts with strong Iron Stand 3 10 0



528

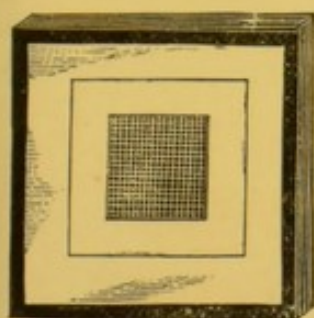


529

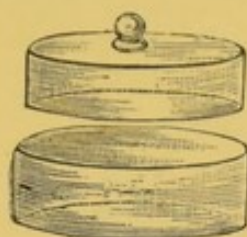


530

- 528 Water Bath, Stout Copper, for Test Tubes, 6 in. diameter, with Tripod Stand £0 13 6
- 529 Hot Water Funnel Jacket, Copper, on 3 Legs, with Funnel 4 in. diameter, complete 0 7 6
- 530 Tripod Levelling Stand, Strong Polished Oak and Brass Mounts, outside measure $14\frac{1}{4}$ in. for Levelling Glass Plates, Dishes, &c. 0 6 6



531



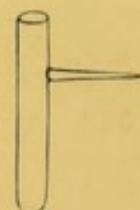
532



533



536



537

- 531 Polished Oak Frame, $10\frac{1}{2}$ in. square, for counting Bacteria, with Glass Plate $8\frac{1}{2}$ in. square, marked in $\frac{3}{8}$ in. to $4\frac{1}{2}$ in. squares, and 9 sub-divisions, with Black Glass at Back $5\frac{3}{4}$ in. square ... £1 0 0
- 532 Glass Covers, Stout, 9 in. by $2\frac{3}{4}$ in., with Polished Edges, for Damp Chambers and Plate Cultivations... .. per pair 0 3 0
- 533 Glass Dishes, Stout, $8\frac{1}{2}$ by $\frac{3}{4}$ in., with Polished Edges ... each 0 1 0
- „ Pans, flat bottom (*See Basins, Glass, Fig. 204*).
- 534 „ Trays, extra Stout, with Polished Edges—
 $5\frac{1}{4}$ in. by 1 in., each 1/; 9 in. by $1\frac{1}{2}$ in., 2/ each
- 535 „ Plates for Drying, 5 in. by $3\frac{1}{4}$ in. per doz. 0 1 9
- 536 „ Bulbs, Sternberg's, for storing purposes „ 0 1 9
- 537 „ Test Tubes, Aitken's „ 0 1 9

Pasteur and Lister Flasks, Beakers, Desiccators, &c. *See under their respective headings.*

- 538 Nutrient Tubes, of Agar-Agar and Peptone, Gelatine Sterile ... doz. 0 6 0



539



540



541



542

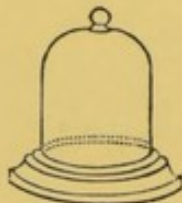
DRYING APPARATUS OR DESICCATORS.

Old
Cat.No.

333	539	Desiccator, Bohemian Glass accurately ground, Dome or Flat Top, for Chloride Calcium, Sulphuric Acid, &c.	each	£0	4	6
334	540	„ Ditto, with Stout Ground Glass Cover ... ..	...	0	2	6
334A	541	„ Accurately Ground, with Glass Stopcock ... ..	...	0	6	6
334B	542	„ Ditto improved with Stop-cock and Glass Hook, according to Professor Schiff—				
		Internal diameter of top 4 inches		0	7	0
		„ „ 5 „		0	10	6



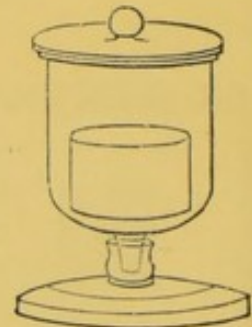
543



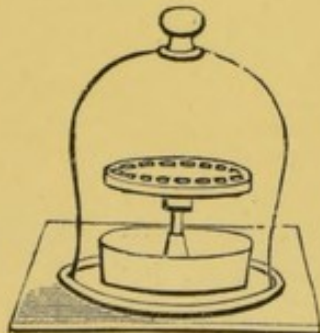
544



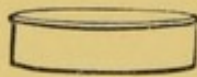
545



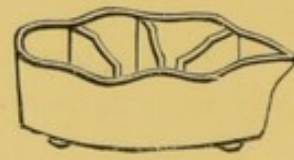
546



549



550



551

335	543	Drying Apparatus, with Bell Glass Cover, Glass Plate and Dish. Diameter of Cover, 5½ in.	each	£0	5	6
		„ 6½ „	„	0	7	6
		„ 8 „	„	0	10	6
336	544	Drying Apparatus, same, with Mahogany Stand and Ground Glass Plate, extra ... ..	...	0	1	0
337	545	„ with Stand and Porcelain Sulphuric Acid Dish, each		0	11	6
338	546	„ Erdmann's, with Stout Glass Cover, Glass Dish and Stand complete each		0	8	6

Old
Cat.No.

1615 547 Glass Plates, Stout, ground on one side for Desiccators—

$8\frac{1}{2} \times 8\frac{1}{2}$	10 × 10	11 × 11 in.
1/6	2/	2/6 each

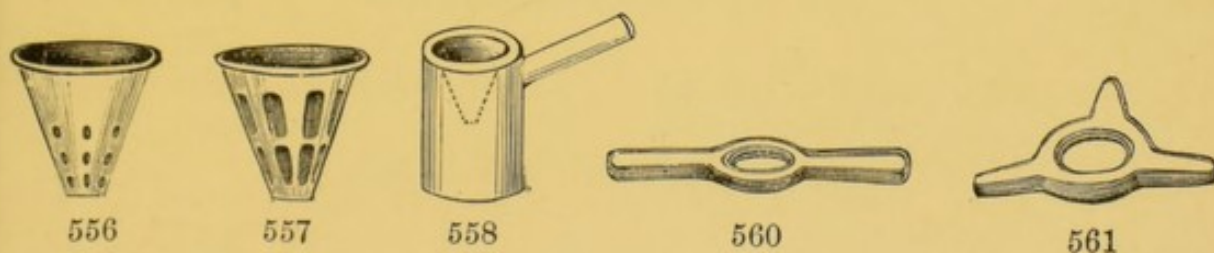
339	548	Porcelain Sulphuric Acid Dish, with perforated Wooden Table to fit the Pan, for Funnels, Capsules, &c. Diameter of Pan, 5 in.	£0	3	0
339A	549	„ with Ground Glass Plate and Cover, complete	0	7	6
340	550	„ Salt-glazed Stoneware Pan, to contain Sulphuric Acid, Flat Bottom, 6 in. × 2 in., 1/; 8 in. × 2 in. ...	0	1	3
340A	551	„ with Partitions for the support of Capsules, under a Glass Receiver. Berlin Porcelain, $4\frac{3}{4}$ in. diameter	0	4	6
		„ „ Dresden $4\frac{1}{8}$ „	0	3	0
		„ „ „ $4\frac{7}{8}$ „	0	3	6

Electrical Apparatus (see Special List).

Eudiometers (see Graduated Instruments).

341	552	Files, Round, for Enlarging Holes in Corks, with handle, each 6d. and	0	0	9
342	553	„ Triangular, for Cutting Glass Tube & Rod, with handle, each 6d. and	0	0	9
348	554	„ Flat... .. „ 1s. and	0	1	6
344	555	„ Rasps each	0	1	0

Wood Handles for Small Files 1d. each.



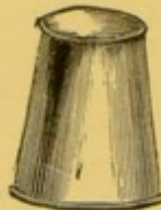
345 556 Filter Drainers, Berlin Porcelain—

2	3	$4\frac{1}{4}$	$5\frac{1}{2}$	$6\frac{1}{2}$ in. diameter
6d.	1/6	1/9	2/	3/6 each

346 557 Filter Holders, Dresden Porcelain (Skeleton Funnels), for Quick Filtering—

$4\frac{1}{2}$	$5\frac{1}{4}$	6 in. diameter
2/	2/6	3/6 each

347	558	Filter Dryers, Berlin Porcelain	... ..	each	£0	2	6
348	559	„ White Porcelain	... ..	„	0	1	9
349	560	Filter Rings, White Stone Ware, 2 arms	... ..	each 3d. and	0	0	5
350	561	„ „ „ 3 „	... ..	„ 6d. and	0	0	9



Old Cat.No.	562	563	564	579				
351	562	Filter Cutters, Tin Triangular	...	...	the set	£0	0	6
351A	563	„ Dryer, Tin, either form ...	...	...	...	0	0	6
	564	„ Tube for Asbestos	...	...	...	0	0	6
352	565	Filter Paper, Coarse Dutch,	Size 24 × 24 in.	per quire		0	2	6
				„ ream		2	5	0
353	566	„ White English	„ 22 × 18 in.	„ quire		0	1	4
				„ ream		1	1	0
354	567	„ „ Best	„ 24 × 24 in.	„ quire		0	2	0
				„ ream		1	15	0
355	568	„ Rhenish, manufactured by Messrs. Schleicher and Schüll, Rhenish Prussia, very uniform and recommended as a substitute for Swedish.						
		Ordinary thickness—						
		No. 595	... 18 $\frac{3}{4}$ × 21 $\frac{1}{2}$ in.,	per quire		0	1	4
		„	„	„ ream		1	5	0
356	569	„ No. 598, Extra Stout,	22 $\frac{1}{4}$ × 22 $\frac{1}{4}$ in.	„ quire		0	4	3
		„	„	„ ream		3	15	0
357	570	„ No. 597, Stout	... 22 $\frac{1}{4}$ × 22 $\frac{1}{4}$ in.	„ quire		0	2	6
		„	„	„ ream		2	4	0
358	571	„ Swedish, Genuine, Müncktells Mark—	21 × 17 in.	„ quire		0	4	0
		„	„	„ ream		3	10	0
358A	572	„ „ No.1A, Selected		„ quire		0	5	0
		„	„	„ ream		4	10	0
359	573	„ English, Cut Circular, in Packets containing 100 each—	2 $\frac{1}{4}$ 2 $\frac{3}{4}$ 3 $\frac{3}{4}$ 4 $\frac{1}{2}$ 5 $\frac{1}{2}$ 7 $\frac{1}{2}$ 9 in. diam.					
			3d. 4d. 5d. 6d. 9d. 1/ 1/6 per packet					
360	574	„ Rhenish, (No. 595) Cut Circular, in packets containing 100 each—	4 $\frac{1}{4}$ 7 9 11 12 $\frac{1}{2}$ 15 18 $\frac{1}{2}$ 24 27 $\frac{1}{4}$ 32 39 c.m. diam.					
			1 $\frac{3}{4}$ 2 $\frac{3}{4}$ 3 $\frac{1}{2}$ 4 $\frac{1}{4}$ 5 5 $\frac{7}{8}$ 7 $\frac{1}{4}$ 9 $\frac{1}{2}$ 10 $\frac{1}{2}$ 12 $\frac{1}{2}$ 15 $\frac{1}{4}$ in. diam.					
			4d. 4d. 5d. 6d. 7d. 9d. 11d. 1/8 2/4 2/9 3/3 per packet					
360A	575	„ Rhenish (No. 597, Stout)—	1 $\frac{5}{8}$ 4 $\frac{1}{2}$ 5 5 $\frac{7}{8}$ 7 $\frac{1}{4}$ 9 $\frac{1}{2}$ 12 $\frac{1}{2}$ 15 $\frac{1}{4}$ in. diam.					
			5d. 9d. 10d. 1/ 1/3 2/ 3/2 4/ per packet.					

RHENISH AND SWEDISH FILTER PAPERS.

Alterations and Additions.

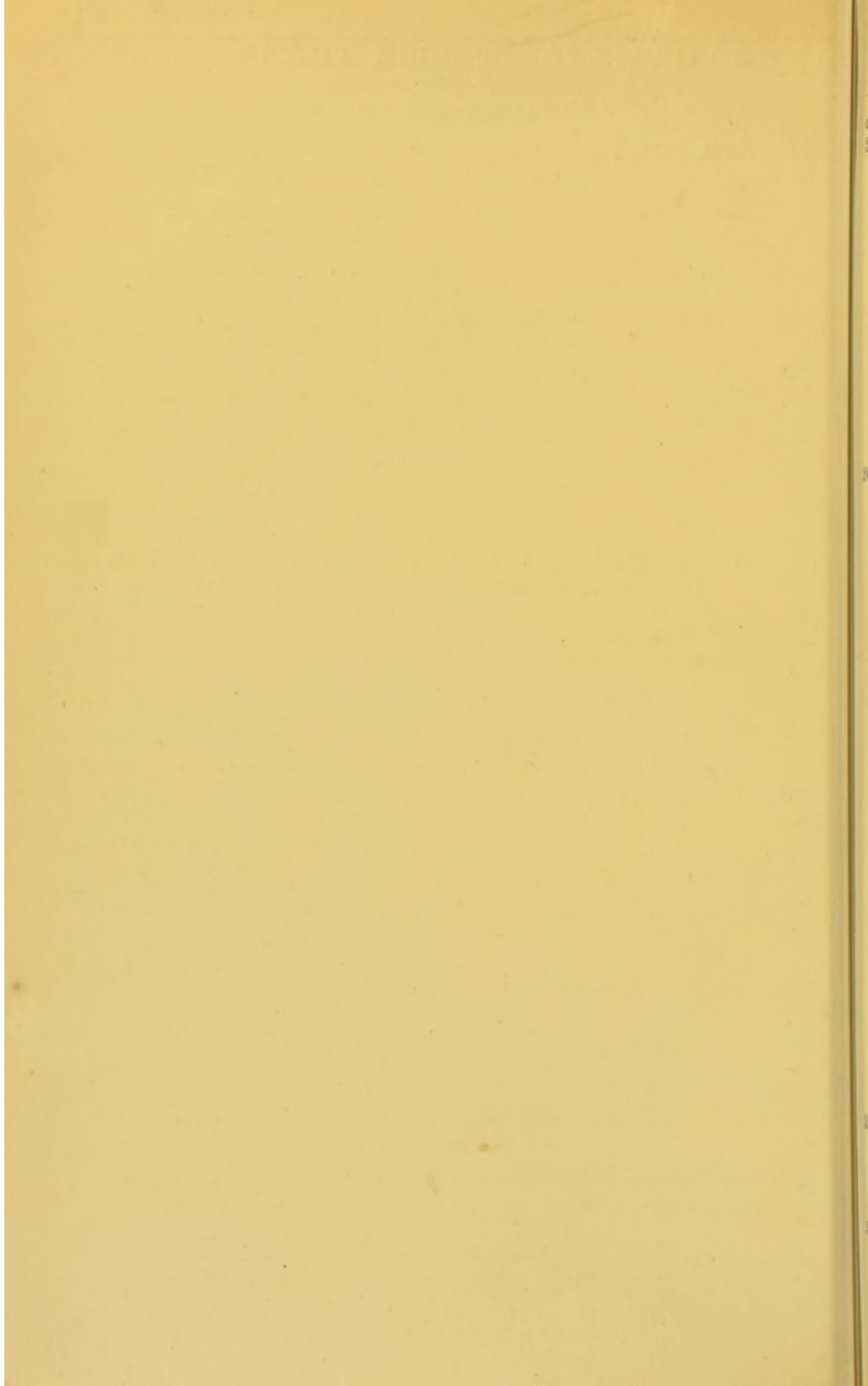
575	Filter Papers, Rhenish, stout (No. 597)—	5½	7	9 c.m. diam.
		2¼	2¾	3½ in. diam.
		5d.	6d.	8d. per 100
		3/10	4/	5/10 per 1000
577	Filter Papers, Chemically pure, Schleicher & Schull— No. 590—Price for 11 c.m. diam. should be 1/10.			
578	.. Folded, No. 588—	24	32	38½
		2/6	4/	5/3
		2/6	4/	5/3
579	.. Folded, No. 586, extra thick—			38½
				50 c.m. diam.
				10/9
				12/6 per 100

MUNCKTELL'S GENUINE SWEDISH FILTER PAPER.

Having made special arrangements with the Manufacturers, and being the Depôt in London for the above, we are prepared to give special terms to dealers in quantities.

571	Filter Paper, Swedish, genuine Muncktell's Mark—							
	No. 1 F.	21	×	17 in.,	per	quire	£0 4 0	
						per	ream 3 10 0	
	No. 2	21	×	17 in.,	per	quire	0 3 0	
						per	ream 3 0 0	
571A	.. No. 1 Grey... ..	21	×	17 in.,	per	quire	0 1 6	
						per	ream 1 0 0	
571B	No. 0—Extracted with Hydrochloric and Hydrofluoric Acid, and washed, is free from colour, contains no Acid, and the smallest quantity of Ash, which is insoluble with the greatest heat—							
		21	×	17 in.,	per	quire	£0 6 0	
						per	ream 5 10 0	
580	Cut Circular Filter Papers, No. 1 F—	5½	7	9	11	12½	15	18.5 c.m. diam.
		2¼	2¾	3½	4¼	5	6	7¼ in. diam.
		4d.	5d.	8d.	10d.	1/	1/3	1/9 per 100
		3/	3/9	6/	7/6	9/	11/	16/ per 1000
								<i>In Original Boxes containing 500.</i>

580A	Cut Circular Filter Papers, No. 0 Extracted—	5½	7	9	11	12½	15 c.m. diam.
		2¼	2¾	3½	4¼	5	6 in. diam.
		8d.	10d.	1/3	1/9	2/	2/6 per 100
		5/6	7/	11/	14/6	17/	22/ per 1000
							<i>Packed in Original Boxes containing 500.</i>



Old
Cat.No.

360B 576 Filter Paper, Chemically pure, (No. 589) for Analytical purposes; extracted by Hydrochloric and Hydro-fluoric Acid by Messrs. Schleicher and Schüll, and recommended by Dr. Fresenius. Duration of Filtration: 1 Filter, $5\frac{7}{8}$ in. diam., will filter 100 c.c. of distilled water in 37.6 seconds. Same size, best Swedish, in 218.3 seconds—

$5\frac{1}{2}$	7	9	11	$12\frac{1}{2}$	15 c.m. diam.
$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{2}$	$4\frac{1}{4}$	5	$5\frac{7}{8}$ in. diam.
1/6	1/8	2/6	3/	3/3	3/9 per 100
15/	16/	24/	29/	32/	38/ per 1000

360c 577 ,, chemically pure, extracted by Hydrochloric and Hydrofluoric Acids (No. 590), Red Label on Green. One Filter, 9 c.m. diameter, of this make leaves 0,000085 grammes only of ash. Supplied in packets containing 50 each—

$5\frac{1}{2}$	7	9	11	$12\frac{1}{2}$	15 c.m. diam.
$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{2}$	$4\frac{1}{4}$	5	$5\frac{7}{8}$ in. diam.
11d.	1/	1/6	1/9	2/	2/6 per packet

578 ,, Folded (No. 588), for rapid filtrations—

$12\frac{1}{2}$	$18\frac{1}{2}$	24	32	$38\frac{1}{2}$	50 c.m. diam.
5	$7\frac{1}{4}$	$9\frac{1}{2}$	$12\frac{1}{2}$	15	$19\frac{3}{4}$ in. diam.
1/2	1/9	2/3	3/9	5/	7/6 per 100
9/8	15/	21/	34/6	45/	71/ per 1000

579 ,, Folded (No. 586), extra thick—

$38\frac{1}{2}$	50 c.m. diam.
10/6	11/6 per 100.

Sole Agents for all Schleicher & Schüll's Filter Papers in London,

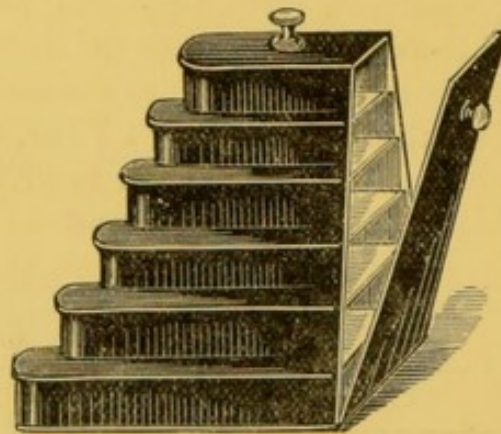
TOWNSON & MERCER.

361 580 Filter Paper, Genuine Swedish, No. 1 A—

$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{2}$	$5\frac{1}{2}$	$7\frac{1}{2}$ in. diam.
4d.	6d.	1/	1/3	2/	2/6 per pkt.

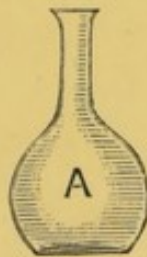
362 581 ,, Strong Grey French, cut circular in packets of 100 each—

6	$7\frac{1}{2}$	$9\frac{1}{2}$	13	$15\frac{1}{2}$	$17\frac{1}{2}$	$19\frac{1}{2}$ in. diam.
8d.	10d.	1/	1/6	2/	2/3	2/6 per packet

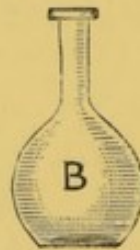


	Old Cat.No.	582		583		585	584	
363	582	Filter Cases, Japanned Tin, to contain 1 Packet—						
			2½	3	4	5	6	8 in. diam.
			4d.	5d.	6d.	7d.	9d.	1/ each.
364	583	„ Japanned Tin, to contain 2 Packets of each size						£0 7 6
	584	Quick Filtering Apparatus (Plimpton's) as used at the University College, London, Complete with Porcelain perforated Filter Plate						0 8 0
	585	„ with Cylindrical Funnel						0 8 6
		India Rubber Cone for use with perforated Platinum Crucible, extra						0 1 0
1629	586	Paper, Glazed for Sampling, White, Yellow, and Black, per quire 3/; per sheet						0 0 2

Flasks, Gauged and Marked (*See Graduated Instruments*).



587A



587B



587C

FLASKS.

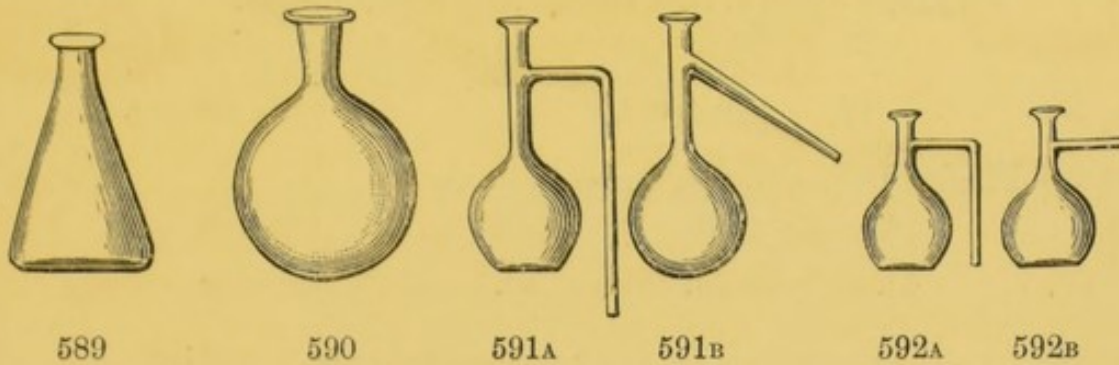
For Boiling, Best White Bohemian Hard Glass.

365	587	Flasks. A. Flat Bottom. B. Welted Neck. C. Pear Shape.					
		Smallest Welted Neck 8 oz., and Pear Shape 4 oz. Either form the same price.					
		Capacity, ozs.	Price each.	Capacity, ozs.	Price each.		
		1	£0 0 3	40	£0 1 0		
		2	0 0 3	48	0 1 1		
		4	0 0 4	64	0 1 2		
		6	0 0 5	80	0 1 4		
		8	0 0 6	100	0 1 6		
		12	0 0 7	130	0 1 9		
		16	0 0 8	160	0 2 6		
		20	0 0 9	200	0 3 0		
		24	0 0 10	240	0 3 6		
		32	0 0 11	320	0 4 0		

Old
Cat.No.

366 588 Flasks, Best White German Glass, same form as Fig. 587c—

Capacity, ozs.	Each.	Price per doz.	Capacity, ozs.	Each.	Price per doz.
1 ...	2d. ...	£0 1 3	12 ...	5d. ...	£0 4 0
2 ...	2d. ...	0 1 4	16 ...	5d. ...	0 4 6
3 ...	2d. ...	0 1 6	20 ...	6d. ...	0 5 0
4 ...	2d. ...	0 1 9	24 ...	7d. ...	0 6 0
5 ...	3d. ...	0 2 0	32 ...	8d. ...	0 7 0
6 ...	3d. ...	0 2 6	40 ...	9d. ...	0 8 0
8 ...	4d. ...	0 3 0	48 ...	1/- ...	0 10 0
10 ...	4d. ...	0 3 6	64 ...	1/1 ...	0 12 0



367 589 Flasks, Best German, Conical Form.

2	4	6	8	10	12	16	24	32 oz. capacity
2/	2/6	2/9	3/	3/6	4/	5/	6/	6/6 per doz.

368 590 ,, Bohemian Globular (Bolt Heads), with welted neck.

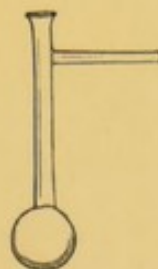
10	18	36	48 lbs. capacity.
2/6	4/6	5/6	7/6 each.

369 591 ,, with Side Tube from neck, for distillation of small quantities, either form, A or B, same price.

1	2	4	8	12	16	24	32	48 oz. capacity
4d.	6d.	8d.	10d.	11d.	1/	1/3	1/6	1/9 each.

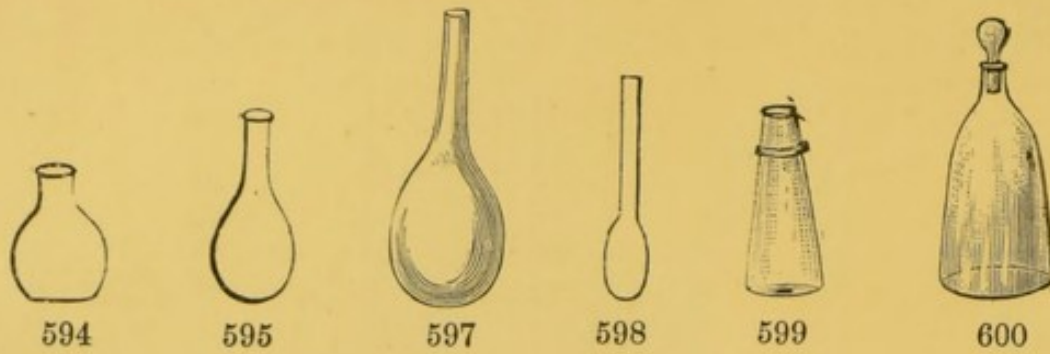
369G 592 ,, with Side Tube, Yeast Forcing Flasks, for Brewers, either form, A or B, same price—

2	4 oz. capacity.
6/	8/ per doz.



593

593 ,, with Side Tube for Estimating Gas Tar Products, Bulb 1 oz. capacity per doz. £0 5 0



Old
Cat.No.
869C

594 Flasks, wide neck, for Carbonic Acid Apparatus, &c.

2	3	4	5	6	8 oz. capacity.
3/	3/6	4/	5/	6/	7/ per doz.

869D 595 Flasks, Bohemian Glass, round bottom—

4	8	12	16 oz. capacity.
4d.	6d.	8d.	10d. each

869E 596 ,, Extra Hard Glass for preparing Oxygen, round bottom—

4	8	12	16 oz. capacity
6d.	8d.	10d.	1/ each

869F 597 ,, German, Florence Oil Pattern ... per doz. £0 4 0

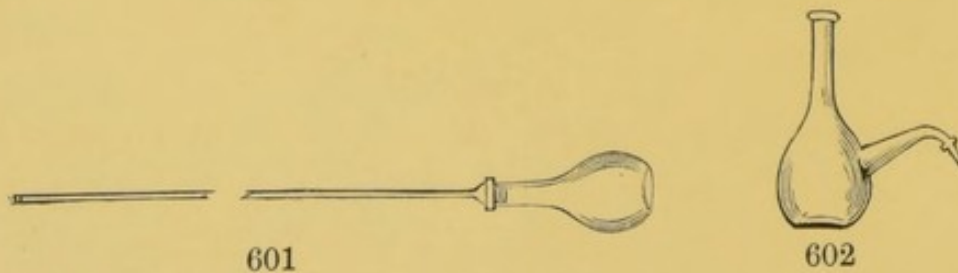
370 598 ,, Assay, Bulb, Best German Glass—

2	3	4 oz. capacity
2/6	3/3	4/ per doz.

371 599 ,, Assay, Conical Parting, best German Glass—

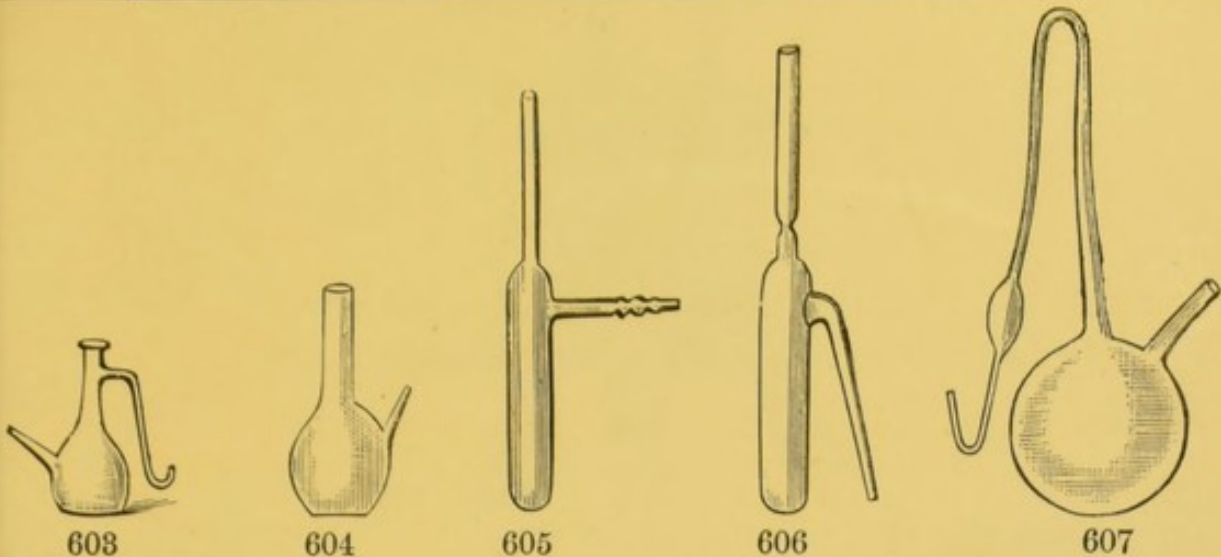
4	6	8	10	12	16	20	24 oz. capacity
3/	3/6	4/	4/6	5/	6/	10/	12/ per doz.

371A 600 ,, with Stopper, for Silver Assay, as used in the
Bombay Mint per doz. 1 10 0



371B 601 Flasks, Assay, for Anthraquinone, 24 oz. capacity, with
Tube 34 inches, Stoppered in Neck each 0 4 0

371C 602 ,, Sir J. Lister's, for the Cultivation of Bacteria ... 0 2 6



Old
Cat.No.

1616 603 Pasteur's Flasks, with Side Tube and long bent Arm—

8 18 35 oz. capacity

1/6 2/ 3/ each

1617 604 „ „ with Side Tube—

4 8 18 35 70 oz. capacity

8d. 10d. 1/3 2/ 3/ each

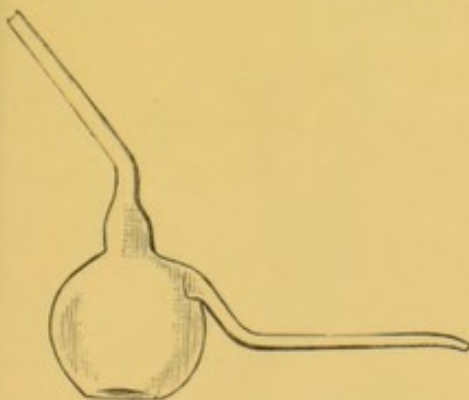
1618 605 „ „ Cylindrical, with Side Tube pointed ... each £0 1 0

1619 606 „ „ „ „ bent ... „ 0 1 0

1620 607 „ „ Round or Pear Shape, with bent Tube and Bulb—

4 8 18 35 70 oz. capacity

1/ 1/6 2/ 3/ 4/ each



608



609



610

1621 608 Pasteur's Flask, with Side Tube and bent Neck same price as above.

1622 609 „ „ with Cover—

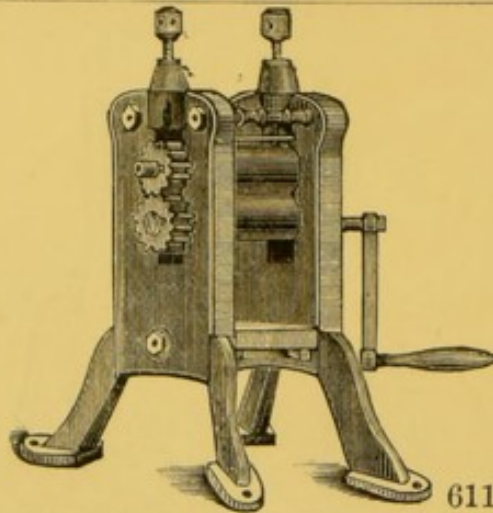
50 100 c.c. capacity

10d. 1/ each

1623 610 Bunsen's Erlenmeyer Flask, for Filtration—

5 8 16 24 35 oz. capacity

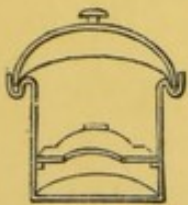
9d. 1/ 1/4 1/6 2/ each



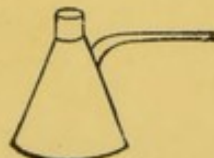
Old
Cat.No.

372 611 Flatting Mill, Best Make, Steel Rollers—

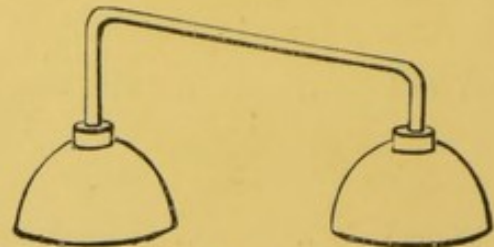
Size of Roller	2 inches	...	...	...	...	each	£4	10	0
"	2½	"	...	...	...	"	5	10	0
"	3	"	...	...	...	"	6	10	0



612

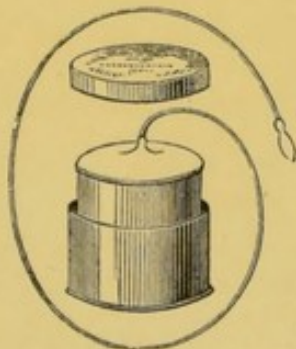


613



614

373	612	Fluoric Acid Apparatus, Brunner's, made of Lead, diam. 4 in. × 4 in.	...	each	£0	8	0
374	613	" " with Tubulure (Retort), capacity about 1 pint	...	"	0	7	6
375	614	" " Retort and Receiver, diameter of retort and receiver 3½ in.	...	"	0	12	6



615



616

SILICATED CARBON FILTERS.

376	615	Syphon Filter, for Travellers, 2½ in. diam., in Metal Box	...	£0	3	0
	"	" " 3½ " " Stoneware, in Metal Box	...	0	6	0
	"	" for Emigrants, 5 in. diam., Stoneware, with Silver-plated Tap, in Enamelled Metal Box	...	0	14	0
377	616	Silicated Carbon Filter, for table use	... 2 pints each	0	4	6
	"	" " " " " "	... 3 " "	0	6	0

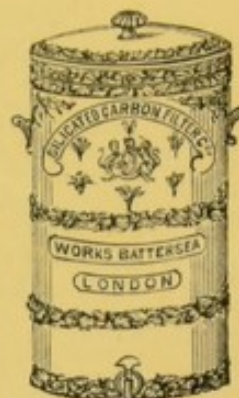
Old
Cat.No.



617

378 617 Domestic Filter—

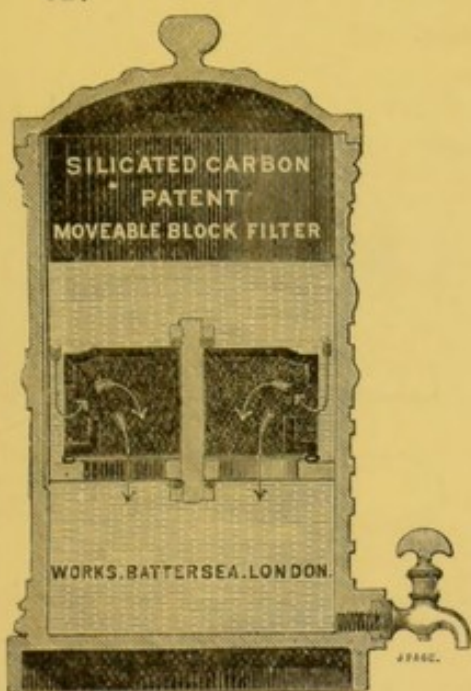
1	gall.	£0	17	6	With Ice Compt.	£1	0	0	
2	"	1	5	0	"	"	1	10	0
4	"	1	16	0	"	"	2	2	0
6	"	2	8	0	"	"	2	12	0



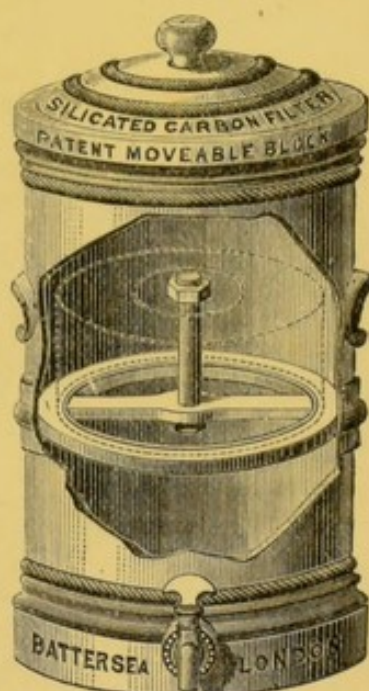
618

379 618 Silicated Carbon Filters—

Ornamental stoneware, 2 gallons capacity, with silver-plated tap £1 15 0



(Section.)



619

(Elevation with Block removed.)

Old
Cat.No.

379A 619 Silicated Carbon Patent Moveable Block Filters.

These Filters are constructed on Scientific principles, and can be renewed or repaired by the user without returning to the maker. They possess all the advantages of those with fixed filtering mediums, while the simple removal of the Silicated Carbon Block leaves the *whole* of the interior of the Filter open for inspection and cleansing. The working parts are stoneware, and no corrosion is possible.

The block being non-porous on the top and edges, an *upward* direction is given to the water, which thus passes through a greater thickness of the Silicated Carbon, as shown by the arrows in drawing.

Extra blocks can be supplied with each Filter. All parts being interchangeable, can be replaced in case of accidents.

The Silicated Carbon Block can be instantly removed, leaving the whole of the interior of the Filter *open* for inspection and cleansing.

To Cleanse the Block, plunge it into boiling water, and well scrub it with a hard brush.

This Patent can be adapted to all patterns manufactured by the Silicated Carbon Filter Co. *without increased charge*. In ordering please state "*with Patent Moveable Block.*"

Domestic Filters (as 619), in Cream-coloured Stoneware, with Plated Taps and Patent Moveable Blocks :—

No. 27. O.	$\frac{1}{2}$ gal.	10/6 each.	D.	6 gals.	42/ each.
A.	1	14/6	E.	8	52/
B.	2	21/	F.	12	70/
C.	4	32/			

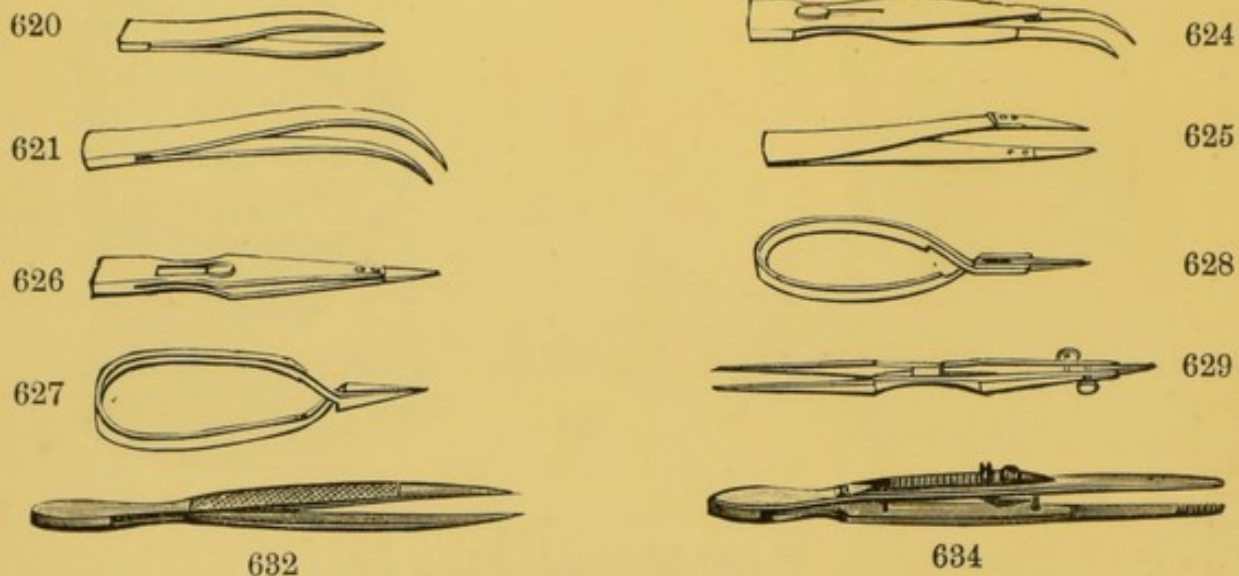
Dining Room Filters, in Marbled China, with Plated Taps and Patent Moveable Blocks :—

No. 22 A.	2 gals.	35/ each.
B.	5	80/

Refrigerative Terra Cotta, do. do. :—

No. 25.	2 gals.	31/6 each.
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Filters of all makes can be refitted on this principle, 1 gal. 8/6, 2 gals. 10/-, 4 gals. 12/-, each. Larger sizes in proportion.

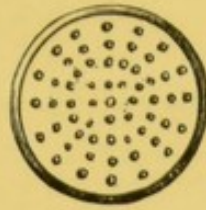


FORCEPS.

Old Cat.No.									
380	620	Forceps,	Brass, or Nickel Plated	...	...	each	6d. and	£0	0 9
381	621	"	"	with bent ends	...	"	6d. and	0	0 9
382	622	"	Steel	"	...	...	each	0	1 0
383	623	"	Brass,	with steel points	...	...	"	0	1 0
384	624	"	"	and studs for fixing objects	...	...	"	0	1 6
385	625	"	"	with ivory points	...	...	"	0	2 6
386	626	"	"	with platinum points and studs	...	...	"	0	4 6
387	627	"	Steel Bow	...	...	each	8d. and	0	1 0
388	628	"	"	with platinum points	...	...	each	0	4 0
389	629	"	Steel	...	...	...	"	0	2 6
390	630	"	"	with platinum points	...	...	"	0	6 0
391	631	"	German Silver,	with platinum points	...	...	"	0	7 6
391A	632	"	Polished Steel	...	...	...	"	0	1 6
391B	633	"	"	with Platinum ends	...	...	"	0	4 6
391C	634	"	Strong German Silver,	with slide for fixing object	...	...	"	0	6 6
391D	635	"	Strong Steel polished do.	...	...	...	"	0	9 6



636



637



638

Old
Cat.No.

1626	636	Filter Ring, Glass. Diam. 3 in. Height $1\frac{1}{4}$ in. ...	each	£0	0	6
1627	637	Plates, Porcelain, perforated for quick filtering with Glass, Wool, Asbestos, or Filter Paper ...	each	0	0	6
1628	638	Beale's, for testing small quantities in large solutions ..		0	0	8



639



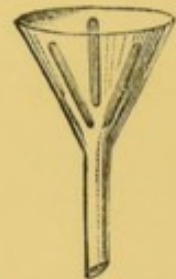
640



641



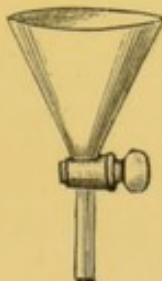
642



643



644



645



646



649

FUNNELS.

892 639 Funnels, Best Bohemian Glass, with ground edges, the sides inclined at angle of 60° , plain or ribbed (fig. 639 or 640)—

1	$1\frac{1}{2}$	$2\frac{1}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{3}{4}$	$5\frac{1}{2}$	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$	$9\frac{1}{2}$	$10\frac{1}{4}$ in. diam.
3d.	3d.	4d.	5d.	6d.	7d.	8d.	10d.	1/	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{2}{3}$	3/	$\frac{3}{6}$ each

893 640 Funnels, Best German Glass, plain or ribbed (fig. 639 or 640)—

1	$1\frac{1}{2}$	2	$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	6	7	8	9	10 in. diam.
$1\frac{1}{2}$ d.	2d.	2d.	$2\frac{1}{2}$ d.	3d.	$3\frac{1}{2}$ d.	4d.	5d.	6d.	8d.	10d.	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{2}{3}$ each
$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{9}$	$\frac{2}{3}$	$\frac{2}{9}$	$\frac{3}{3}$	$\frac{3}{9}$	$\frac{4}{6}$	$\frac{5}{6}$	$\frac{7}{6}$	—	—	—	— per doz.

Old
Cat.No.

1624 641 **Funnel** for covering Evaporating Basins, Victor Meyer—

8½ 10¼ in diameter

3/ 5/ each

1625 642 ,, with Bulb, for filtering with Glass Wool—

3 4 5 in. diameter

4d. 6d. 8d. each

643 **Funnels**, Hehner & Richmond's Rapid Filtering, with 4 Ribs inside—

Diam. 3¼ in. 8d. 3¾ in. 9d. each

394 644 ,, Thin Blown Glass, set of three small—

Diameter 1 in. to 1¾ in. per set £0 0 4

395 645 ,, Bohemian Glass, with Glass Stopcock (*See also Separators*).—

4¼ 4¾ 5¼ 6¼ 7¼ 8¾ 9¾ in. diameter

5/ 5/6 6/6 7/6 8/6 10/ 12/ each

646 ,, German Glass, with Stopcock—

3½ 4 4½ 5 in. diameter

4/ 4/6 5/ 6/ each

396 647 ,, White Stoneware, Fluted inside—

2¾ 3¾ 4¼ 5½ 6½ 7 7½ 8½ 8¾ in. diam.

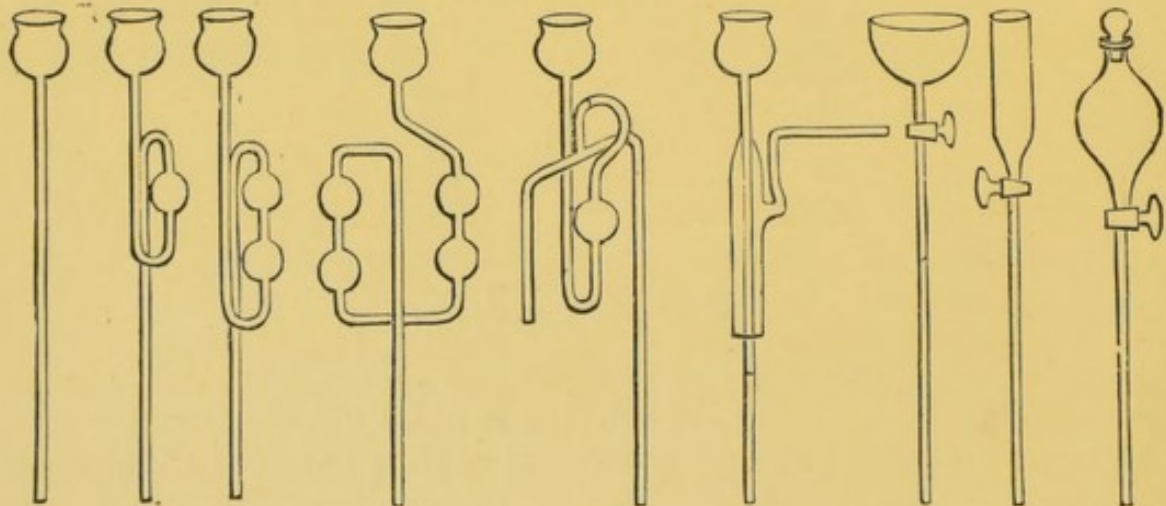
5d. 7d. 1/ 1/9 2/6 3/ 3/6 4/ 5/ each

397 648 **Funnels**, Meissen Porcelain, deeply fluted—

1¼ 2¾ 3½ in. diam.

4d. 1/6 2/ each

397A 649 **Glass Rods**, bent, for quick Filtering... ... per doz. £0 1 6



650 651 652 653 654 655 656 657 658

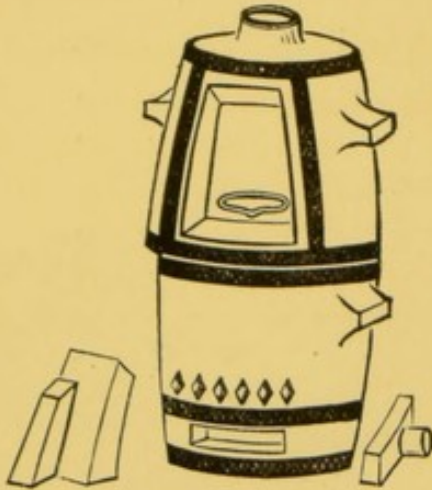
398 650 **Funnels**, Safety, with long Tube for fitting up Gas Flasks, &c.

Length 6 in. to 8 in., each 2d. ... per doz. £0 1 6

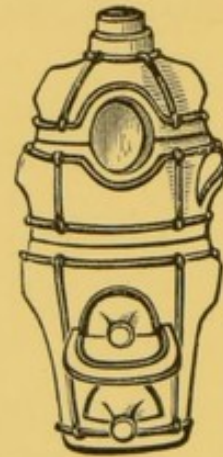
 ,, 10 in. to 12 in. ,, 2½d. ... ,, 0 2 0

 ,, 14 in. ,, 3d. ... ,, 0 2 6

 ,, 18 in. ,, 4d. ... ,, 0 3 0



671



672

CLAY PORTABLE FURNACES.

FOR MELTING GOLD, SILVER, COPPER, &c.

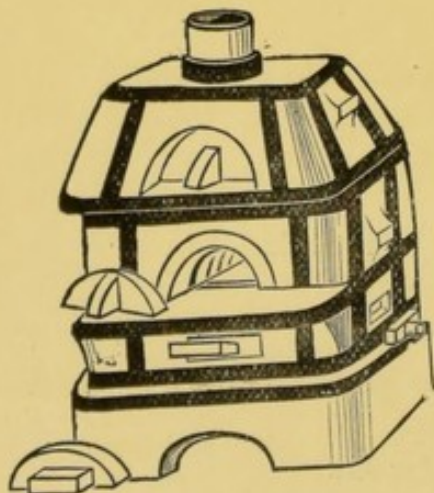
Old
Cat.No.

414 671 Furnaces, Clay, for Crucibles.

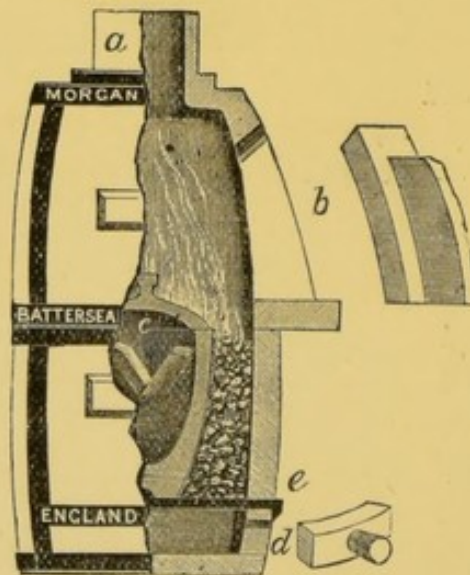
External dimensions—Diam.	Height	Price
9 $\frac{1}{4}$ in.	17 $\frac{1}{2}$ in.	£1 5 0
9 $\frac{3}{4}$ "	20 "	1 10 0
11 "	22 "	1 15 0
13 $\frac{3}{4}$ "	26 "	2 12 6
14 $\frac{1}{2}$ "	28 "	3 10 0
18 "	32 "	4 10 0

415 672 Furnaces, Universal Clay. Height 22 inches, Diameter inside 6 in., outside 9 in., with chimney 3 $\frac{1}{2}$ in., each

Extra Tube Ring for ditto	...	0 3 6
„ Muffle Ring	...	0 3 6
„ Base on Stand	...	0 3 6



673



674

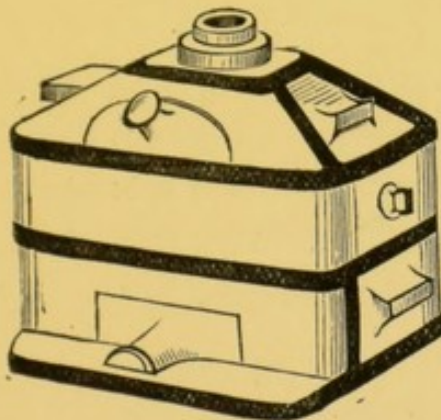
Old
Cat.No.

416 673 Furnaces, Clay for Assaying Dental Work, &c., iron bound.

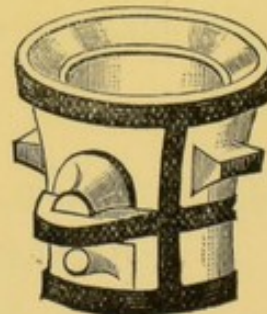
Diam.	Height.	Dimensions of Muffle.		each	£2 0 0
12½ in.	24½ in.	7 × 3½ × 2½ in.			
13¼ "	25¼ "	7½ × 4¾ × 2⅞ "			2 5 0
14½ "	27 "	8 × 4½ × 3 "			2 10 0
15½ "	28½ "	8½ × 5 × 3¼ "			3 5 0
16¼ "	29½ "	9 × 5½ × 3⅝ "			4 0 0
17½ "	30 "	10 × 6 × 4 "			4 10 0

416A 674 ,, Clay for Assaying, Enamelling, &c.—

Front to Back Outside	Inside	Size of Muffles	
12½ in.	9¼ in.	7 × 3½ × 2½	2 5 0
13¼ "	10 "	7½ × 4¾ × 2⅞	2 10 0
14½ "	11 "	8 × 4½ × 3	2 15 0
15½ "	12 "	8½ × 5 × 3¼	3 7 6
16¼ "	12¾ "	9 × 5½ × 3⅝	4 0 0
17½ "	13¾ "	10 × 6 × 4	4 10 0
23 "	19 "	14 × 8 × 5	9 0 0



675



676

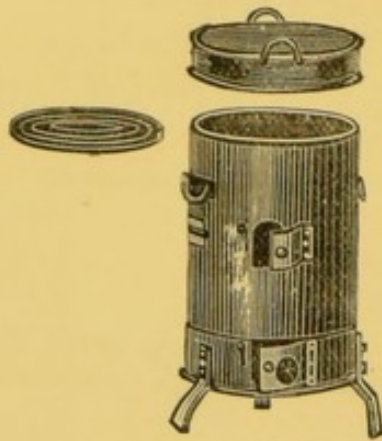
417 675 Furnaces, Clay for Tube Operations—

No. 1,	Internal Diam.	9½ in. × 5½ in.	each	£1 0 0
" 2	"	10 " × 6 " "	"	1 3 0
" 3	"	10¾ " × 6¾ " "	"	1 5 0
" 4	"	13 " × 6¾ " "	"	1 10 0

418 676 ,, Clay (Charcoal Chauffers), for Evaporating—

Nos.	1	2	3	4	5	6	7	8	
	4½	5½	6½	8½	10	10½	11½	13 in.	inside diam.
	3/	4/	5/	6/6	9/	14/	18/	21/	each

419 677 Stout Iron Triangles for the above each extra 0 1 0



678



679

Old
Cat.No.

420 678 **Furnace**, Stout Sheet Iron, lined with Fire Bricks, with Cast Iron Rings and Sand Bath for Assaying, Cupelling, Distilling, Evaporating, and Tube Operations—

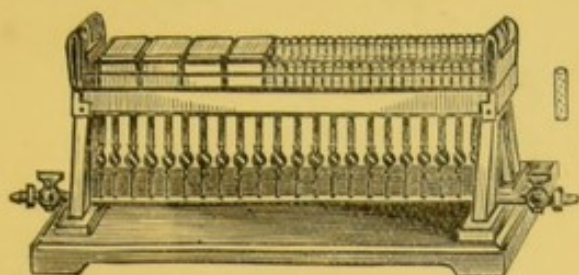
	Depth of Body, 13 in.,	Internal Diameter 8 in.	£3	3	0
	„ 15 „	„ 10 „	4	4	0
	„ 19 „	„ 12 „	5	5	0
	Sheet Iron Elbow and Pipe	... .. extra	0	5	0
	Size of Muffles for £3 3 0 Furnace,	$7 \times 3\frac{3}{4} \times 3\frac{3}{4}$ each	0	2	0
	„ 4 4 0	„ $9 \times 3\frac{3}{4} \times 3\frac{3}{4}$ „	0	3	0
	„ 5 5 0	„ $11 \times 3\frac{3}{4} \times 3\frac{3}{4}$ „	0	3	3
421	679 Furnace , Sheet Iron for Charcoal Chauffer, Round		„	0	2 6
422	680 „ Hood for ditto	... ..	„	0	1 0



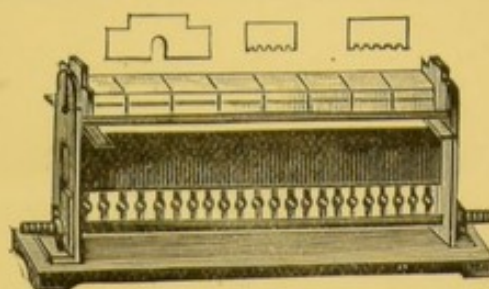
681

FURNACES FOR COMBUSTION.

423	681 Furnace , Combustion, Liebig's Sheet Iron, for Charcoal—				
		Length 24 in.	... ..	each	£0 4 6
		„ 36 „	... ..	...	0 7 0
424	682 „ with Cover	„ 24 „	for two Tubes	...	0 11 6



683



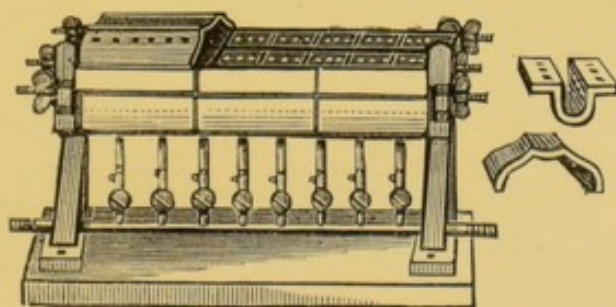
686

Old
Cat No.

FURNACES, GAS COMBUSTION.

425 683 Furnaces, Gas Combustion, Hofmann's, Japanned Iron Body, Best Make, with Unions for Gas Connections, and Clay Burners Complete—

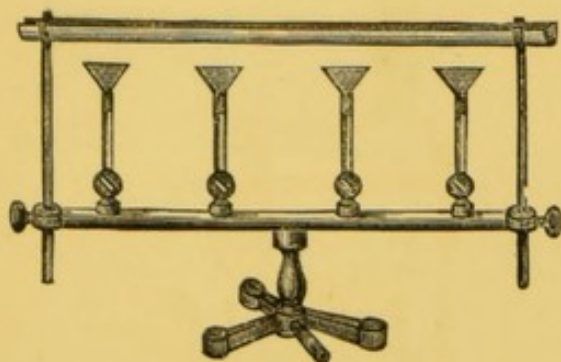
		12 in. long, 12 Stopcocks, 36 Burners, 3 Rows, each	£4 0 0
		20 " 20 " 60 " 3 " "	5 0 0
		26 " 26 " 78 " 3 " "	5 15 0
		34 " 34 " 170 " 5 " "	7 15 0
426	684	Fire Clay Burners per doz.	0 2 6
427	685	Flat Fire Clay Plates "	0 3 6
428	686	Gas Combustion, Bunsen's, Japanned Iron Body, with Unions for Gas Connection and Bunsen's Burners, complete with Clay Plates, best make—	
		15 inches long, 18 Burners, with Stopcocks, each	3 3 0
		17 " 24 " " " "	4 0 0
		21 " 30 " " " "	4 15 0
		25 " 36 " " " "	5 5 0
		30 " 42 " " " "	6 15 0
687		Fire Clay End Pieces "	0 0 10
688		" Tooth Tiles, thick per doz.	0 5 6
689		" " thin "	0 4 6
690		Combustion Tubes, Iron, closed at one end, each	0 2 0



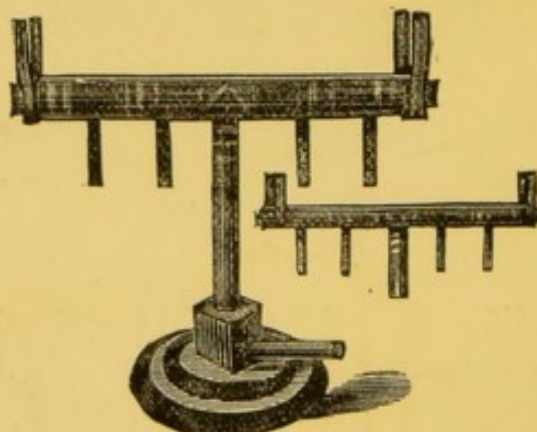
691

428A 691 Furnace, Gas Combustion, Dr. Glaser's, with Cast Iron Perforated Supports for Tubes and Clay Plates complete, with 10 Bunsen's Burners, length 12 inches

		... ..	£3 15 0
"	15	" " " 15 " " "	5 0 0
"	20	" " " 20 " " "	6 0 0
		Clay Plates, dome shape, for top each	0 1 0
		" flat shape, for side "	0 0 6



692

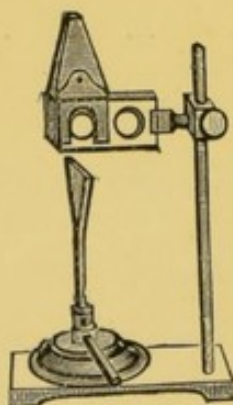


693

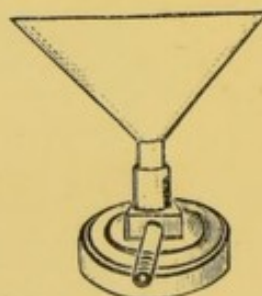
Old
Cat.No.

428B 692 Gas Furnace, with flat Burners for heating Tube, on Iron Stand, with Brass Support and Adjusting Screws, suitable for Lecture Table £0 15 0

693 ,, Professor Ramsay's, University College, London, for Heating Tubes. The upper part has an aperture about $\frac{1}{8}$ inch the whole length, and is supplied with four moveable shutters, so that the whole or part can be used. At each end is a stout support for Tubes, and Bayonet catches so that two or more can be attached. They are adapted to drop inside $\frac{3}{4}$ -in. Bunsen's Burner... .. each 0 9 0
Complete with Bunsen's Burner ,, 0 12 6



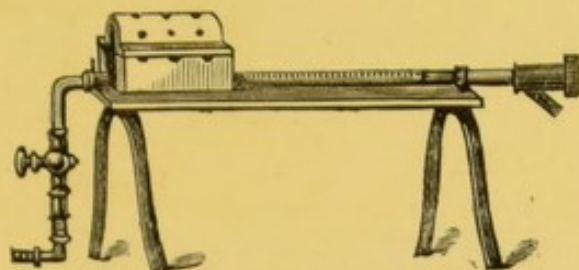
694



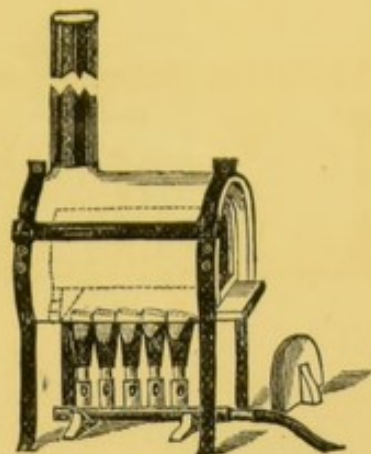
695

428c 694 Gas Lamp Furnace, on Stand complete, with flat Burner, for Crucible or Tube Operations, on Iron Stand, with Adjusting Screws 0 15 0

428D 695 ,, Furnace, with wide flat Burner, 4 in., for heating Tube 0 7 6
Do. do. 6 in. do. 0 8 6



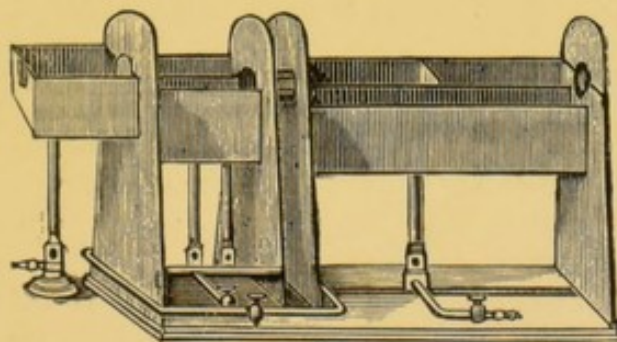
696



697

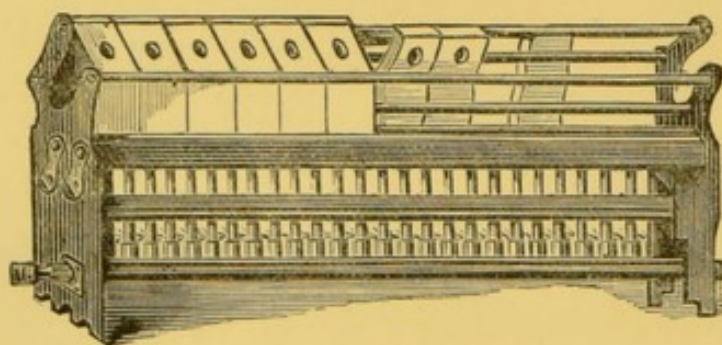
Old
Cat.No.

428E	696	Furnace, Gas Combustion, Townson & Mercer's, consisting of Solid Iron Stand 18 in. long, 5 in. wide, height 10½ in., with perforated Tube 1½ in. diameter, 24 in. long, inside of which is a Spiral Shutter which can be used for turning off or on the flame on part or whole of the Combustion Tube. Tubes can be used up to 2 in. diameter, and is arranged for Foot Bellows where greater heat is required, price complete—each	£3	0	0
		Extra Fire Clay Side Plates	0	1	3
		„ Perforated Dome Tops	0	1	3
428F	697	Furnace, Gas, French Clay, for Sugar Assay, with Burners complete	2	15	0
		Muffles for the above 6½ × 4¾ × 3½ in. high each	0	2	0



698

428G	698	Kopfer's, Combustion Furnace, Sheet Iron, for the Elementary Analysis of Carbon Compounds ...	£2	0	0
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699



700



701

Old
Cat.No.

428H 699 Furnace, Gas Combustion, Erlenmeyer's.

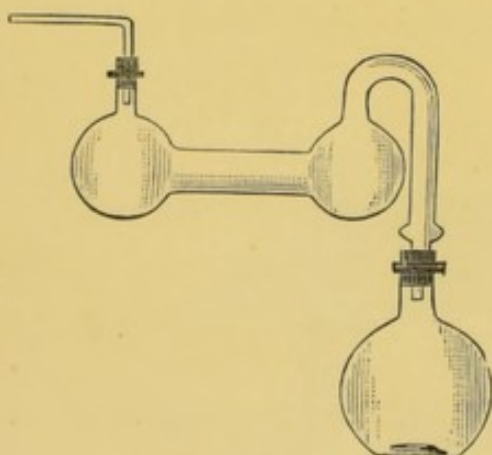
19 in. long, 15 Burners	£5 0 0
25 ,, 20 ,,	...	...	...	...	5 10 0
32 ,, 25 ,,	...	...	...	...	6 0 0

1631 700 Clay Plates, for Erlenmeyer's Furnace	...	...	each	0 0 10
701 ,, Troughs, thin, for support of Tube	...	...	..	0 0 6

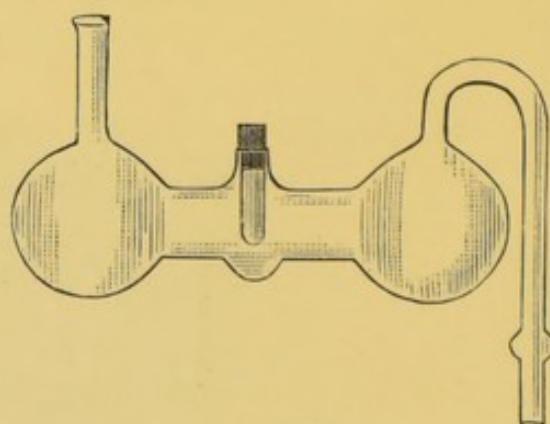
Furnaces, Gas, Fletcher's (*see Fletcher's Special List*).

Galvanic Apparatus (*see Special List*).

Gas Burners (*see "Lamps, Gas"*).

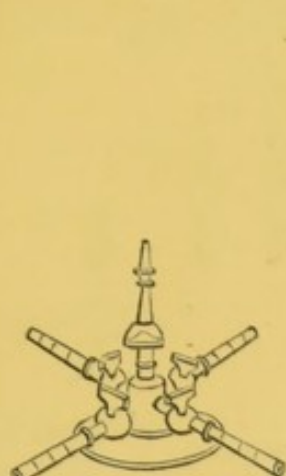


702



703

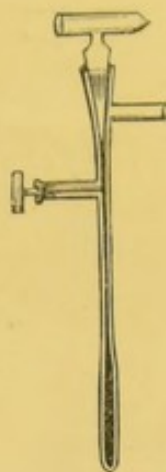
1725 702 Carre's Freezing Apparatus	...	...	...	...	£0 5 0
1726 703 ,, ,, ,,	...	...	...	...	0 6 0



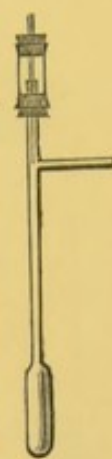
704



706



707



708

Old
Cat.No.

429	704	Gas Distributor, with Stopcocks, four ways	...	...	£0 10 6
430	705	,, large size, with Stopcocks and Unions	...	...	0 15 0
431	706	Gas Regulator, for Air Baths, &c.	...	...	0 5 0
431B	707	,, Glass, Reichardt's, for Drying Ovens, &c.	...	...	0 5 0
431c	708	,, Page's	..	..	0 2 6



709



710



711

432 709 Gas Jars, or Receivers, open top and bottom—

10 16 20 30 40 60 80 100 160 ozs. capacity

8d. 9d. 10d. 1/3 1/6 2/ 2/6 4/6 5/6 each, Plain, Fig. 709

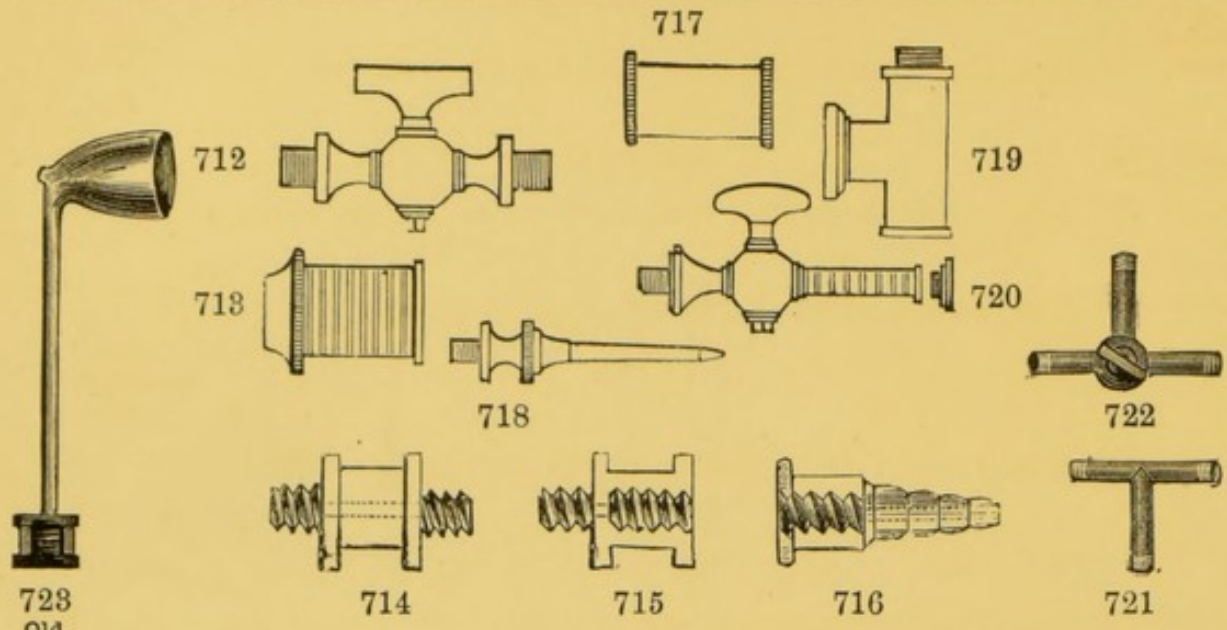
433 710 1/ 1/2 1/4 1/8 2/ 2/9 3/6 5/6 7/ each, Stoppered, Fig. 710

434 711 Gas Jars, with Brass Cap for Stopcock, Plain and Graduated into cubic inches or c. c.—

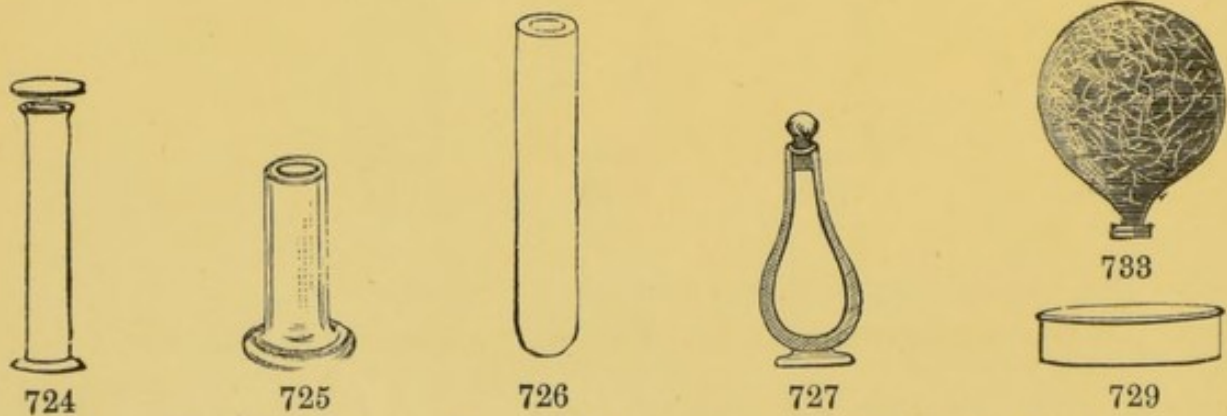
10 16 20 30 40 60 80 100 160 ozs. capacity

1/6 1/9 2/ 2/3 3/ 3/6 4/ 5/6 6/6 each, Plain

4/ 4/3 4/6 5/ 6/6 8/6 10/6 12/6 14/ each, Graduated



Old Cat.No.	Item No.	Description	Unit	Price (£ s d)
485	712	Brass Stopcock	each	£0 2 6
486	713	Bladder Ferrule	"	0 0 9
486A	714	Double Male Screw	"	0 0 9
486B	715	Male and Female Screw	"	0 0 9
486c	716	Female Screw, with elongation for India Rubber connection	"	0 0 10
487	717	Brass Connector	"	0 0 9
488	718	Jet	"	0 0 6
489	719	T Piece	"	0 1 6
440	720	Stopcock for Gas Bags	"	0 4 0
440A	721	T Piece $\frac{3}{8}$ in. diam. for India Rubber connections	"	0 0 6
440B	722	Stopcock, 3 Ways	"	0 3 6
440c	723	Tobacco Pipe, Brass, for Gas Experiments	"	0 2 0



441 724 Gas Cylinders, on foot with flange at top, ground to fit glass plates.

Height.	Diameter.	Each.	Height.	Diameter.	Each.
6 in.	$1\frac{1}{4}$ in.	£0 0 6	$18\frac{1}{2}$	$4\frac{1}{4}$	£0 5 0
8	2	0 0 8	$8\frac{1}{4}$	$4\frac{3}{4}$	0 2 0
10	2	0 0 10	10	$6\frac{1}{4}$	0 3 6
12	2	0 1 0	12	8	0 4 6
12	$3\frac{1}{8}$	0 1 6	14	$9\frac{1}{2}$	0 10 6
14	$2\frac{1}{2}$	0 1 4	16	10	0 18 0
16	$2\frac{3}{4}$	0 1 6	20	$12\frac{1}{2}$	1 15 0
20	$3\frac{1}{8}$	0 3 0			

<small>Old Cat.No.</small>									
442	725	Gas Exploding Tube, for mixed gases, with foot, stout glass, $6 \times 1\frac{3}{4}$ in., each						£0	0 10
443	726	,,		without foot		$9 \times 1\frac{3}{4}$	,,	0 1 0	
443A	727	Stout Glass Detonating Bottle, stoppered, for firing mixed gases						0	1 6
444	728	Gas Tubes, sealed at one end, edge ground—							
		$6 \times \frac{3}{4}$	$7 \times \frac{3}{4}$	10×1	$10 \times 1\frac{1}{8}$ ins.				
		6d.	8d.	10d.	1/	each			
445	729	Gas Trays, White Stoneware, for removing Gas Jars—							
		$2\frac{1}{2}$	3	$3\frac{1}{2}$	4	5	6	$7\frac{1}{2}$ in. diameter	
		3d.	4d.	5d.	6d.	8d.	10d.	1/ each.	
445A	730	Gas Trays, Stoneware, similar to Fig. 728 without rim, height about 1 in.—							
		3	4	5	6	7 in. diameter			
		2d.	3d.	4d.	6d.	8d. each.			
445B	731	Gas Bladders, Prepared Gold Beater's Skin						each	£0 1 6
445C	732	,, ,, ,, ,, ,, with Ferrule						,,	0 2 3
445D	733	,, ,, ,, Bullock's, cleaned, without Ferrule						,,	0 1 9
445E	734	,, ,, ,, Sheep, for Explosion with mixed gases						,,	0 0 6



735

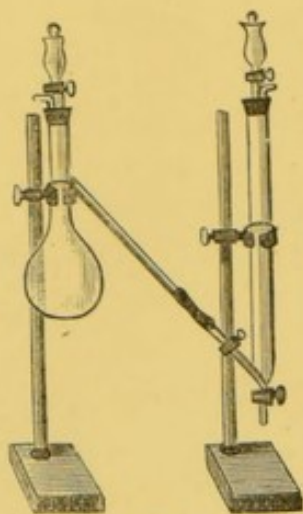


736

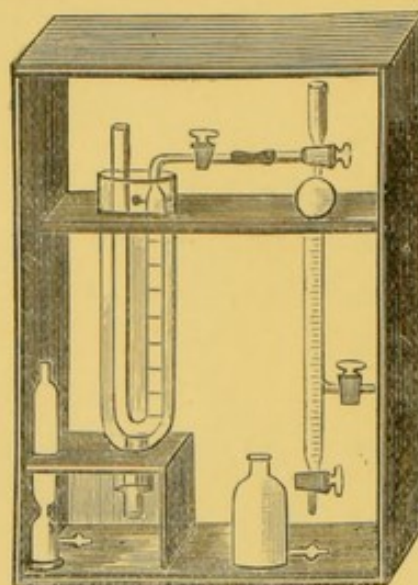


737

446	735	Gas Deflagrating Jars, or Bottles, thin glass, closed at bottom—					
		20	24	32	48	64	80 oz. capacity
		8d.	1/	$1/3$	$1/6$	2/	$2/6$ each.
447	736	Gas Deflagrating Globes, for burning Phosphorus in Oxygen—					
		8	10	12 in. diameter			
		3/	$3/9$	$4/6$ each			
447A	737	Gas Deflagrating Shades, with Knob at top, open at bottom—					
		20	30	40 oz. capacity			
		1/	$1/3$	$1/6$ each			



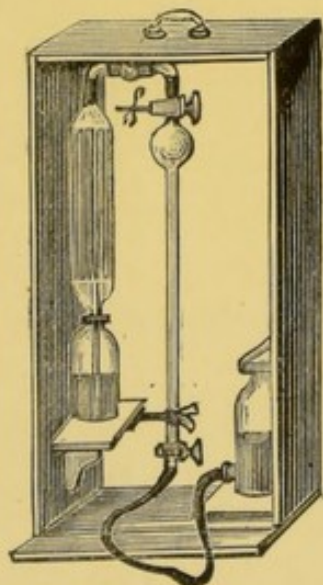
738



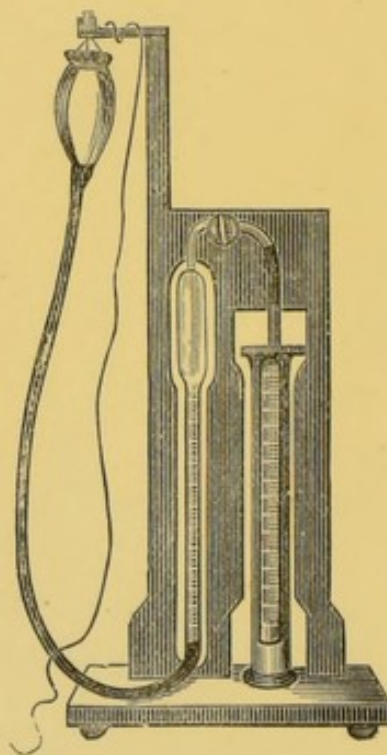
740

Old
Cat.No.

1706	738	Ledebur's Apparatus to determine Sulphur by Bromine, 2 Bulbs with Stopcocks, filled with Glass Beads, Flasks with I. R. Corks and side Tubes, about 250 c.c. capacity, Cylinder with Stopcock	...	...	...	...	...	£0 18 0
1707	739	Two Stands with Clamps for ditto	...	...	...	...	...	0 10 0
1708	740	Allen's Gas Analysis Apparatus, complete in Wood Case	...	...	...	...	...	2 10 0

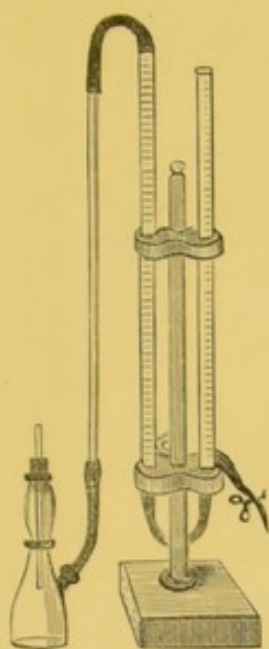


741

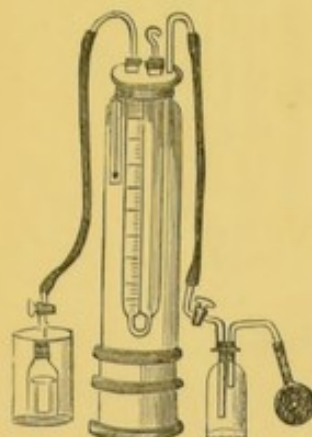


742

1709	741	Zindermann's Apparatus, modified by Winkler, for estimation of Sulphurous Acid, complete in Wood Case...	...	...	...	...	...	£2 10 0
1710	742	Ditto ditto on Stand	...	...	...	...	...	2 5 0



743



744



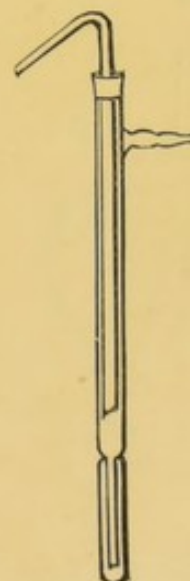
745

Old
Cat.No.

1711	743	Knopp's Ammonimeter, with Stand	..	...	...	£1 0 0
1712	744	„ „ modified by Wagner	..	...	...	2 10 0
1718	745	Schiff's „	..	...	...	0 12 6



746

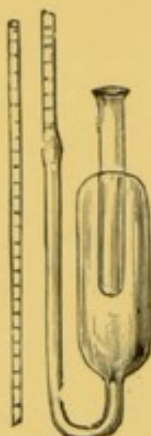


747

1662	746	Gas Regulator, Lothar Meyer's, with millimetre graduations	..	...	...	£0 6 0
1663	747	„ „ Tollen's	..	...	...	0 2 0



748



749



750

Old
Cat.No.

1651 748 Calorimeter, Bunsen's—

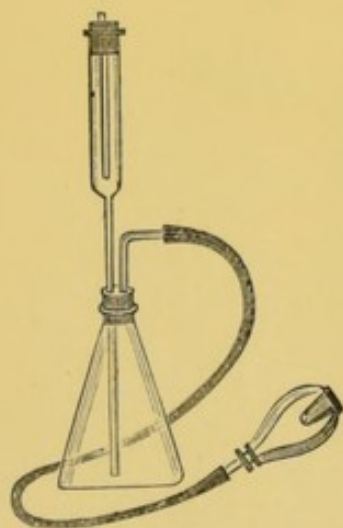
small	medium	large size
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2/	2/6	3/ each
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1651A749 „ with Tube fixed at side graduated into millimetres—

4/6	5/6	6/6 each
-----	-----	----------

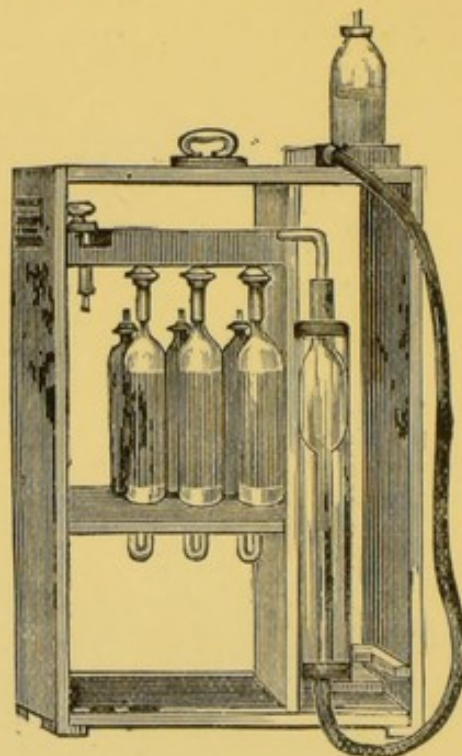
1652 750 Chancel's Apparatus to estimate the specific weight of Gases £0 10 0



751

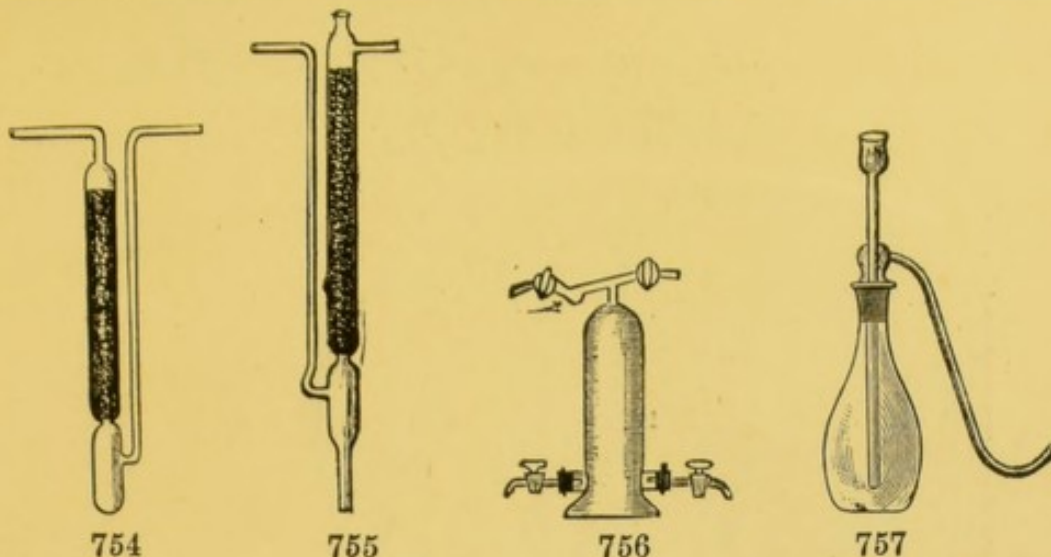


752

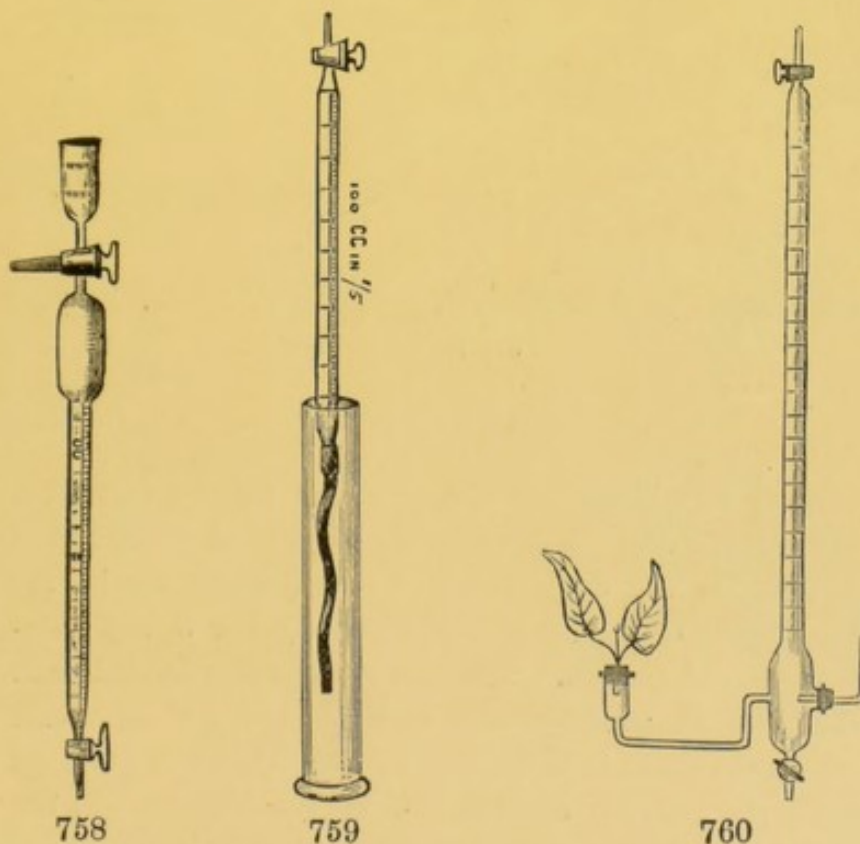


753

1653 751	Lunge's Gas Analysis Apparatus, modified by Winkler, without India Rubber Ball	£0 8 0
1654 752	„ modified by Hesse	0 6 0
1655 753	Orsat Muencke's Gas Analysis Apparatus, complete in Wood Case	8 0 0



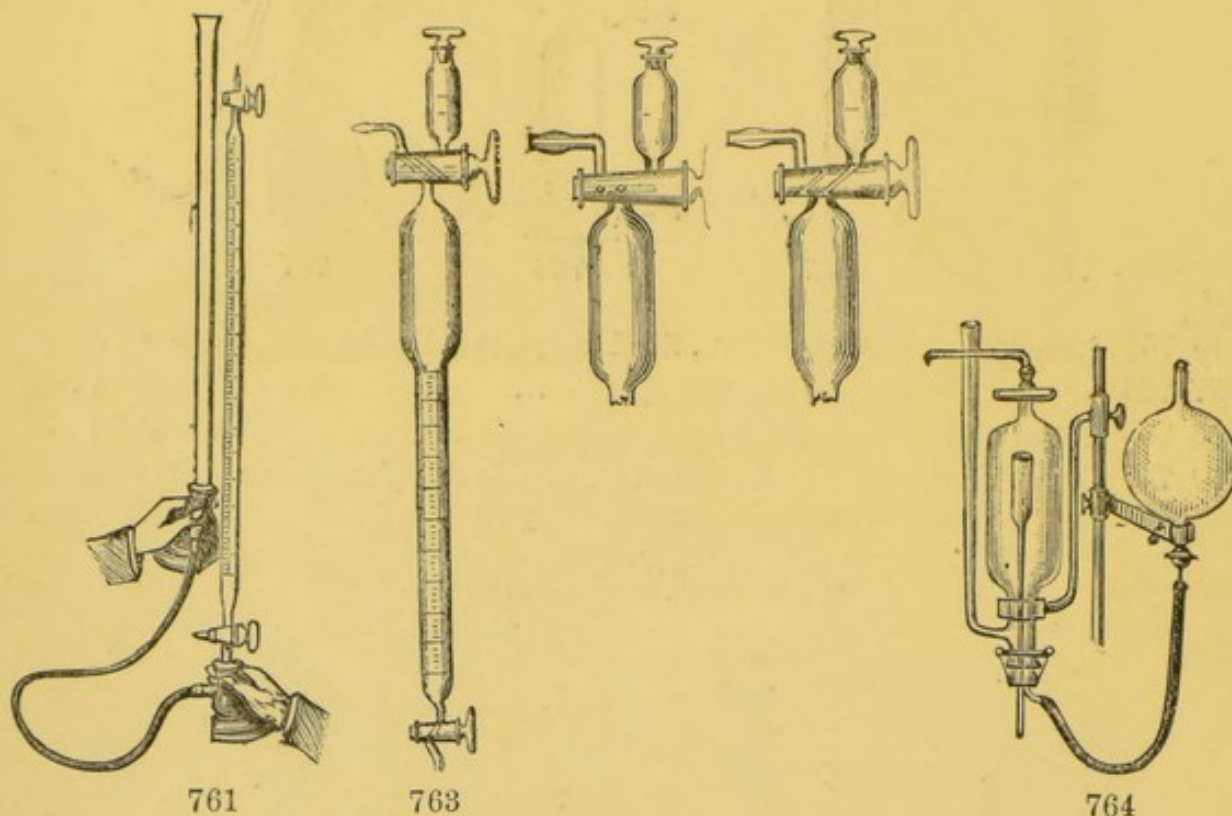
Old Cat.No.						
1656	754	Absorption Tubes, Babo's, filled with Glass Beads	...	£0	3	0
1657	755	" " Emmerling's	... ..	0	4	0
1658	756	Stead's Gas Sample Apparatus, with 4 Stopcocks	...	0	16	0
1659	757	Gas Flask, with bent Tube and Funnel in one piece ground into Neck—				
			$\frac{1}{4}$	$\frac{1}{2}$	1 litre	
			2/	3/	4/ each	



505A	758	Bunte's Gas Burette, for Analysis of Furnace Gases—			
		Graduated 15 to 0 and 0 to 45 in $\frac{1}{10}$ th c.c.	...	£0	15 0
		100 c.c. in $\frac{1}{2}$ th	...	0	15 0

Old
Cat.No.1660 759 Honigmann's Gas Burette, 100 c.c. in $\frac{1}{5}$ th, with Cylinder £0 9 6

1661 760 Moll's Apparatus to measure the Aspiration of Plants ... 0 12 0



761

763

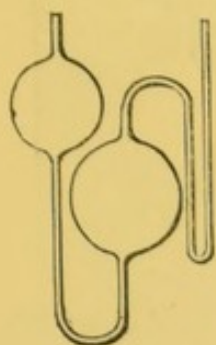
764

1636 761 Gas Burette, Winkler-Hempel, graduated 100 c.c. in $\frac{1}{5}$ th,
on Wood Foot £0 12 0

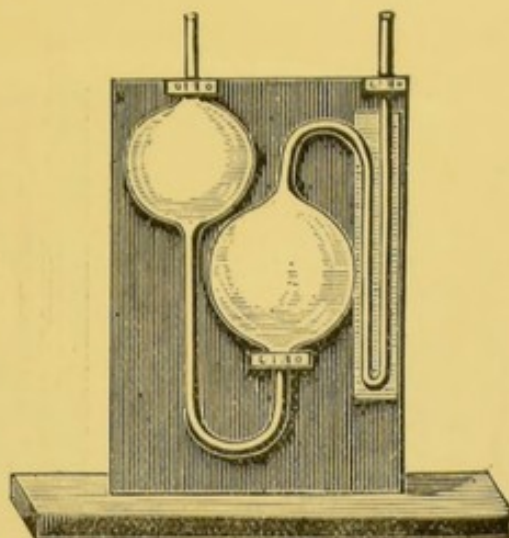
1637 762 ,, ,, ,, with Stopcocks 0 18 0

763 Improved Gas Burette—The new Gas Burette resembles the Bunte's Burette in reference to general construction but avoids the deficiencies of same, consisting in the application of the Stopcocks, especially the 3 way Stopcock of old pattern. The new Burette is provided with the New Patent-Stopcocks with oblique borings which secure the closure and facilitate exact work. The drawings show the peculiar construction of the Burette and the various turnings of the Stoppers

764 Hempel's Apparatus for testing Dynamite and Saltpetre ... 1 6 0
(Stands extra)



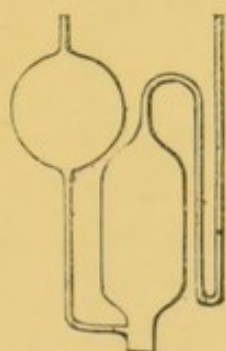
765



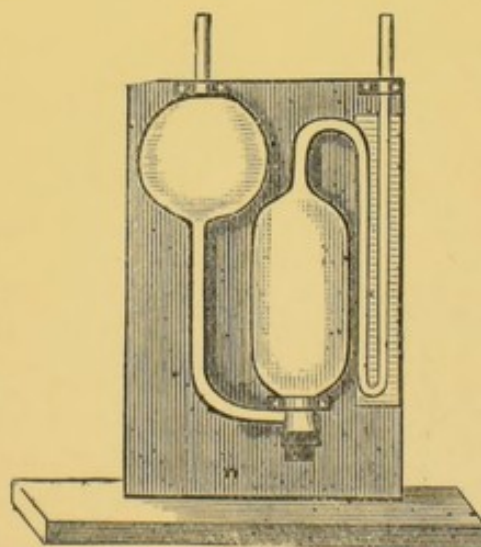
766

Old
Cat.No.

1638	765	Absorption Pipette, Hempel's	...	...	...	...	£0	2	6
1639	766	„ „	on black wood stand	...	...	...	0	5	6

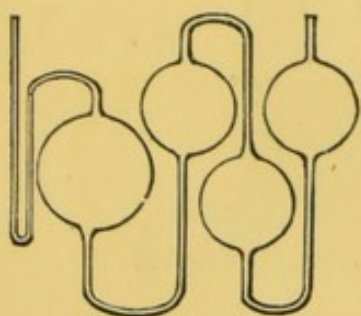


767

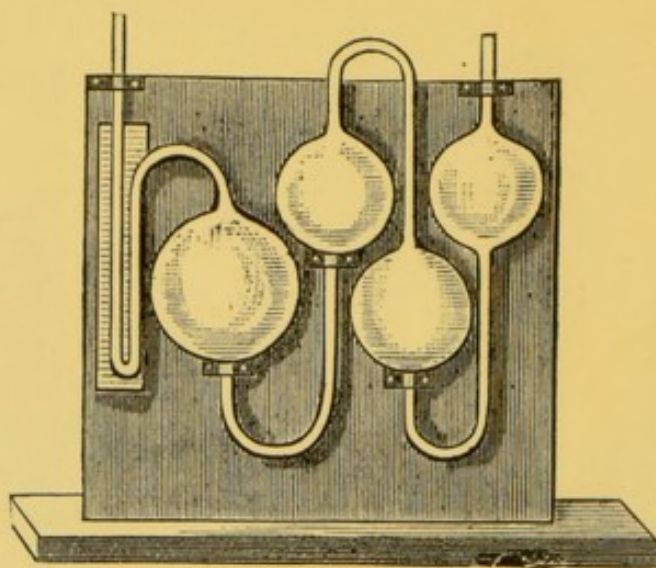


769

1640	767	Absorption Pipette, Hempel's for strong substances	...	...	...	...	£0	3	0
1641	768	„ „	„	with stand	...	...	0	6	0
	769	„ „	„	with opening at bottom of stand for filling	...	...	0	6	0



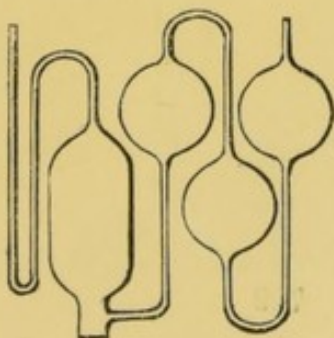
770



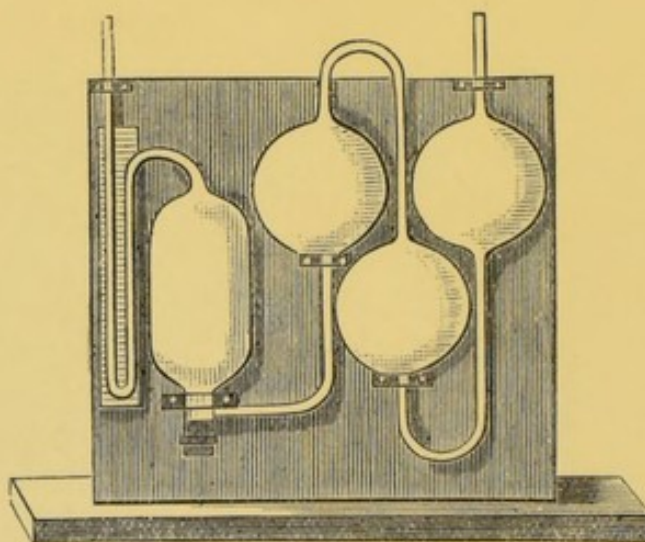
771

Old
Cat.No.

1642	770	Absorption Pipette, Hempel's, 4 Bulbs	£0	5	0
1648	771	„ „ „ with Stand	0	8	0

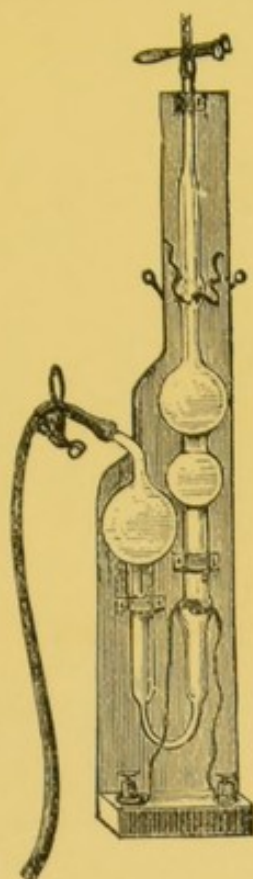


772

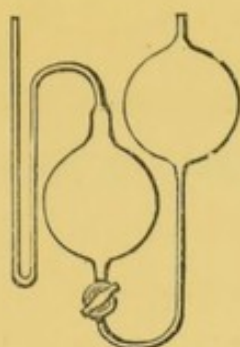


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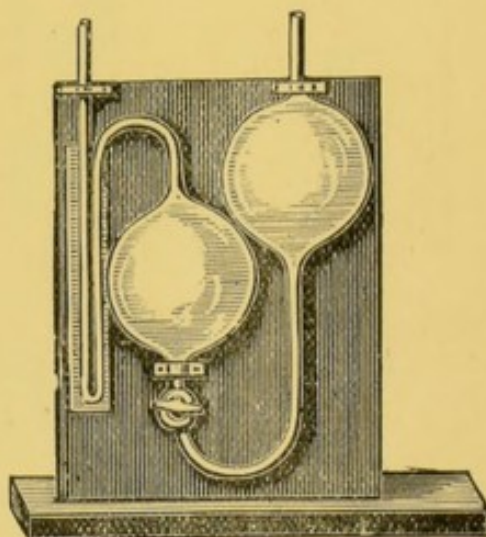
1644	772	Absorption Pipette, for strong substances	£0	5	6
1645	773	„ „ „ „ with Stand	0	8	6



774



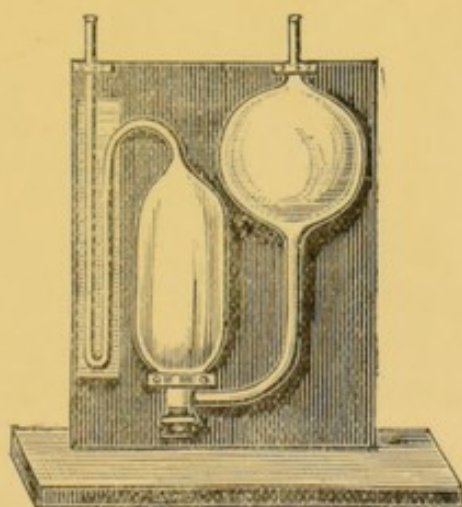
775



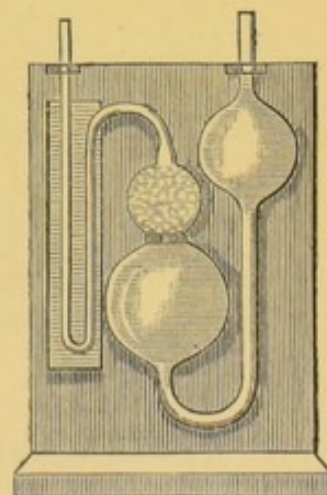
776

Old
Cat.No.

1646	774	Explosion Pipette, Hempel's, with Stand ...	...	...	£0 13 0
1647	775	Hydrogen Pipette, with Stopcock ...	...	...	0 9 6
1648	776	„ „ with Stopcock and Stand	...	...	0 13 0



777



778

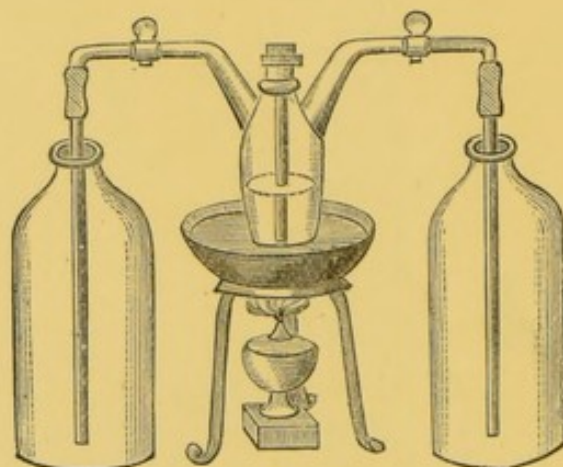
1649	777	Hydrogen Pipette, with Stand ...	...	...	£0 6 0
1650	778	Absorption „ filled with Glass Beads, on Stand	...	...	0 7 0



779



780



781

Old
Cat.No.

447B	779	Gas Generating Bottle, 24 oz., with Safety Funnel and bent Tube	...	...	...	...	...	...	£0	2	6
447c	780	„ „ „ 24 oz., with Safety Funnel, Drying Tube and Jet	...	...	...	...	...	...	0	3	0
447D	781	Zenetti's Chlorine Apparatus, with Spirit Lamp, Copper Sand Dish, and Stand complete	...	...	...	...	...	...	0	18	0

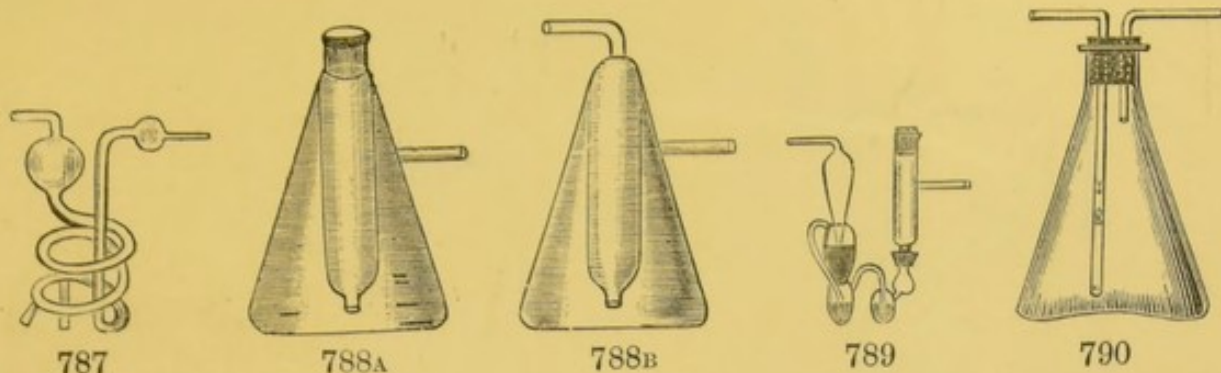


783



785

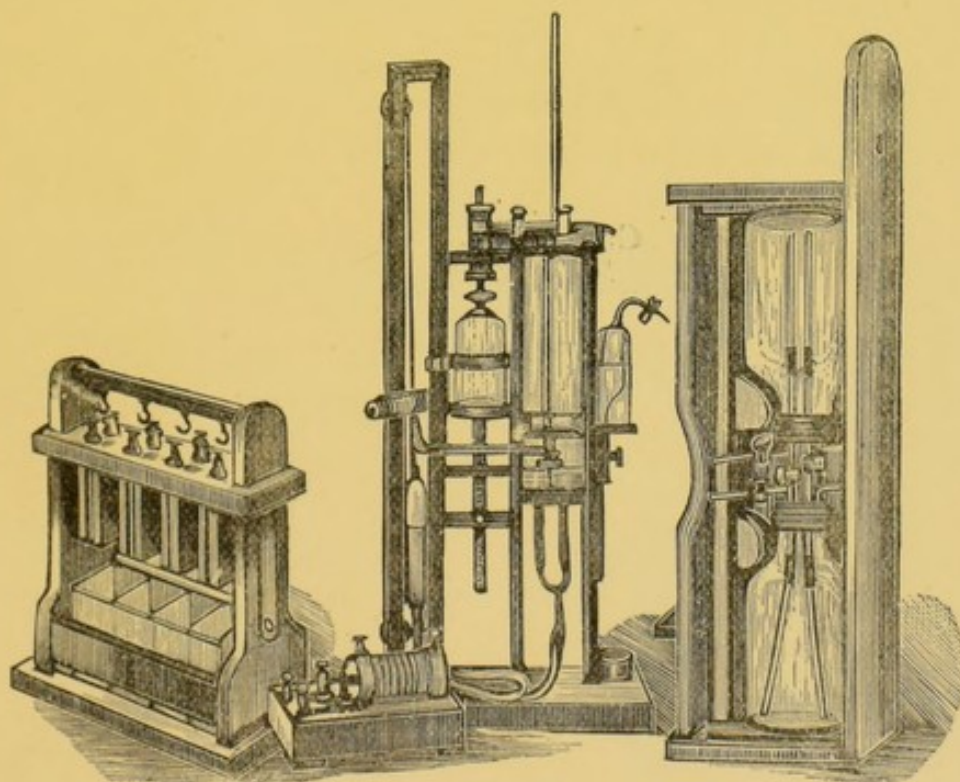
448	782	Gas Deflagrating Spoon	each	£0	0	6
449	783	„ „ with Brass Cap	...	...	...	„	0	0	10
450	784	„ „ „ ground	...	...	...	„	0	2	6
451	785	„ „ Polished Brass on Stand	...	...	...	„	0	1	6
	786	Cedar Splints	...	...	...	per bundle	0	0	6



Old
Cat.No.

1632 787 Absorption Apparatus, Winkler's—

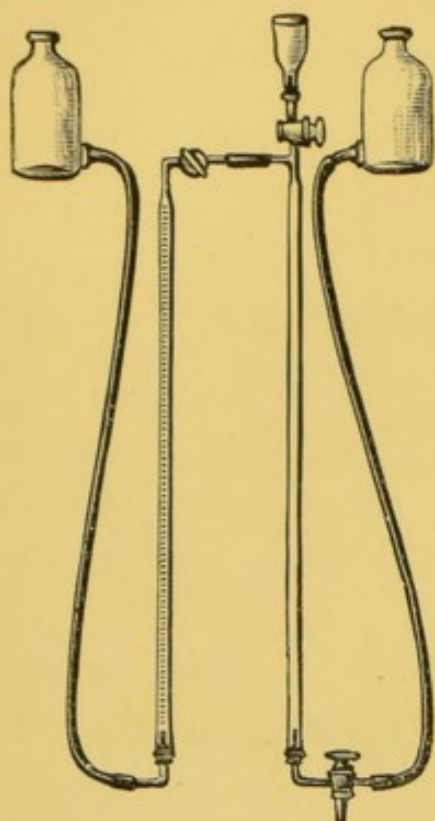
	Small	Medium	Large		
	2/	3/	5/ each		
1633 & 4 788 A B	Flask, Habermann's	...	...	each	£0 1 9
1635 789	Apparatus, for Carbonic Acid, Strohmmer's	..	..	..	0 3 0
790	..	Muencke's, with Valve	..	..	0 3 0



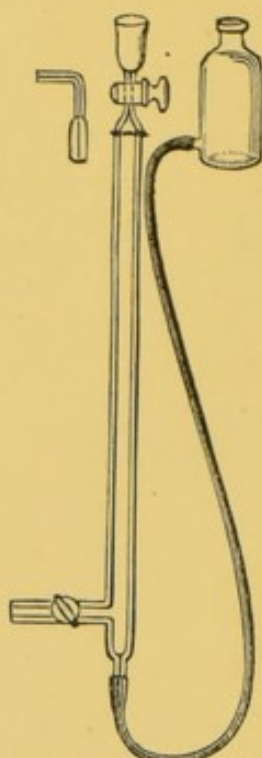
791

451A 791 Stead's Apparatus for the Analysis of Blast Furnace and other Gases, on Mahogany Stand, arranged by Mr. J. E. Stead, F.I.C., Middlesborough £4 10 0

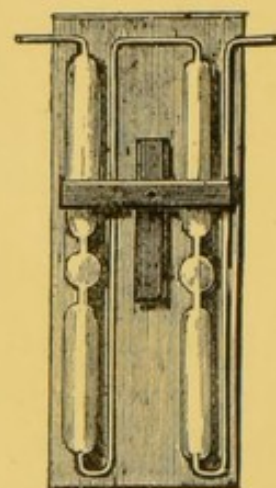
Battery, Induction Coil, and Bottles, on Stand, extra.



792 Fig. 1



792 Fig. 2



794

Old
Cat.No.

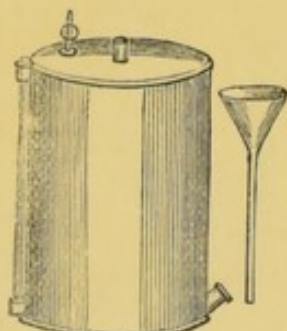
451B 792 Apparatus for Rapid Analysis of Furnace Gases, &c., as described by Mr. A. H. Elliot, *Chemical News*, Oct. 19, 1883.

Price, Fig. 1 complete, £1 10/. Fig. 2, 15/.

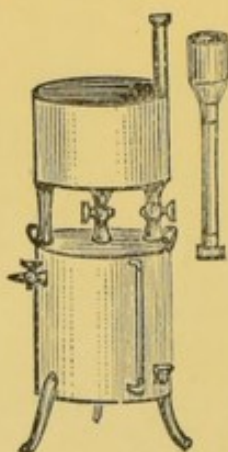
793	Bulbs, Todd's, used with Aspirator for Testing	Flue Gas	...	...	...	each	£0	1	6
794	"	"	fitted to Mahogany Frame	...	"	"	0	6	0



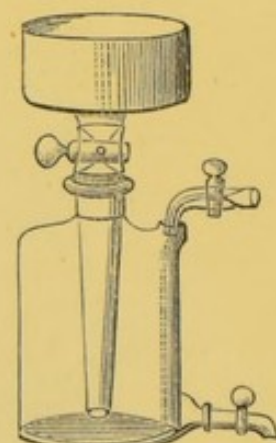
795



796



797



799

795 Gas Bottle, Wanklyn's, with Cap, 100 oz. capacity to the neck, as recommended in "Wanklyn's Gas Engineer's Manual" £0 5 0

452	796	Gas Holders, Stout Japanned Tin, with Brass Stopcock, capacity 2 gallons, each	0	12	6
"	"	" " 4 " "	0	16	0

Old
Cat.No.

453 797 Gas Holders, Stout Japanned Tin, Pepys', with Gauge and Stopcock.

2 4 6 8 gallons capacity

20/ 28/ 33/ 40/ each

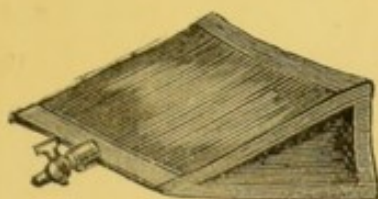
454 798 ,, Stout Copper Japanned, Pepys', with Gauge and Stopcock.

2 4 6 8 gallons capacity

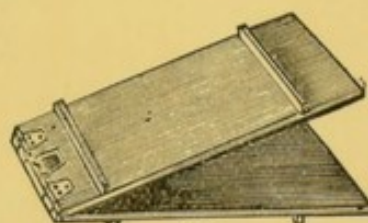
40/ 50/ 70/ 90/ each

454A 799 Glass Gas Holder, with Glass Stopcocks, ground in, capacity 1 gallon £1 4 0

,, ,, ,, ,, 2 gallons 1 12 0



801



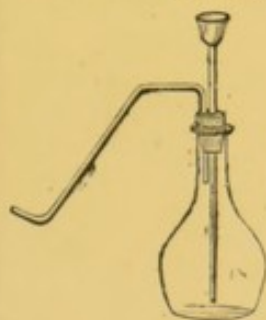
802

455 800 Gas Bags, Vulcanized Rubber, with Ferrule, Cushion Shape, 19 by 17 in. each £0 12 6

456 801 ,, Vulcanized Rubber, Wedge Shape, with Ferrule,
Length. Width. Height at End.
20 inches 12 inches 12 inches each 1 5 0
24 ,, 20 ,, 18 ,, ,, 2 5 0
30 ,, 20 ,, 20 ,, ,, 3 0 0

Stopcocks 2/6 or 4/ each extra. See Stopcocks.

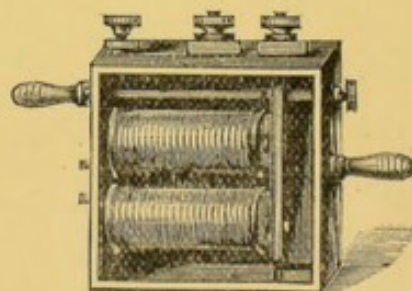
457 802 Pressure Boards, for Gas Bags per pair 0 12 6



803



804



805

458 803 Gas Flasks, fitted with Cork, Bent Glass Tube, and Thistle Funnel for Hydrogen, Chlorine, &c.

Capacity of Flask, 16 24 32 48 oz.

1/3 1/6 1/9 2/ each

459 804 Gas Flask, with Leading Tube for Oxygen, Laughing Gas, &c.

Capacity of Flask, 8 16 24 32 oz.

10d. 1/ 1/3 1/6 each

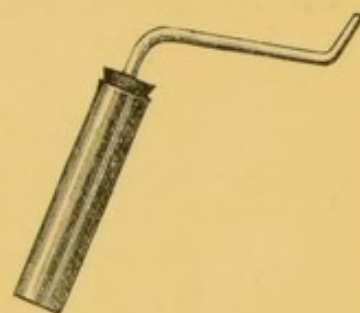
459A 805 Gas Regulator, Schiebler's, with Electro Magnet, by which the flow of Gas is governed £1 15 0



806



807



809

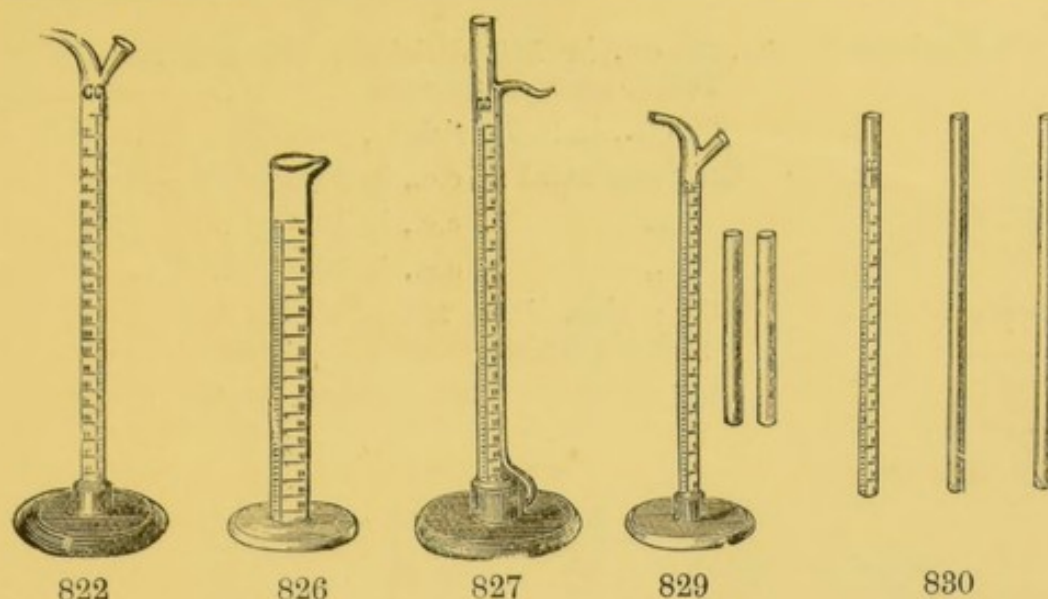
Old
Cat.No.

460	806	Gas Retort, Sheet Iron for Chlorate of Potash and Manganese, top to be luted with Stourbridge Clay each	£0 4 6
461	807	,, Conical form ,,	0 7 6
462	808	,, ,, with Copper Bottom ,,	0 8 6
463	809	,, Copper Tube for small quantities, fitted with Cork and Glass Leading Tube ... each	0 2 6

(See also "Retorts, Iron.")

464	810	Glass Tubing, free from Lead, for Bending and Connecting Apparatus, Leading Tubes, &c., diam. outside, $\frac{3}{16}$ in. to $\frac{3}{4}$ in., and in lengths of about 3 ft. per lb.	0 1 0
465	811	Glass Tubing, fine Quill, $\frac{1}{8}$ Diameter outside ... per lb.	0 2 0
466	812	,, Large Diam., 1 inch to $1\frac{1}{4}$ inch ,,	0 1 6
		,, $1\frac{1}{2}$,, $1\frac{3}{4}$,, ,,	0 2 0
		,, 2 ,, $2\frac{1}{4}$,, ,,	0 2 6
467	813	,, Tube, Stout, for Steam Gauges ,,	0 1 6
468	814	,, ,, ,, cut in lengths ,,	0 2 6
469	815	,, ,, Barometer ,,	0 1 6
470	816	,, ,, Thermometer ,,	0 2 0
471	817	,, Hardest Bohemian Potash Glass for Combustion ,,	0 1 4
472	818	,, ,, Quill, for Blowpipe use, $\frac{3}{16}$ to $\frac{5}{16}$ inch Diameter, outside ,,	0 1 8
473	819	Glass Rod, German Glass, for Stirrers, $\frac{1}{8}$ inch to 1 inch diameter ,,	0 1 0
474	820	,, Coloured ,,	0 1 3
475	821	,, White Opaque ,,	0 1 3

Glass Plates, Ground. (See "Covers, page 51.")



GRADUATED INSTRUMENTS.

Carefully Divided into Equal Parts for use as Test Measures or General Quantitative Operations, also Flasks and Pipettes, Gauged to Deliver Precise Quantities.

Old
Cat.No.

476 822 Bink's Burettes, or Alkalimeters.

20	30	50	50	50 cubic centimetres
200	300	100	250	500 divisions
2/6	3/	3/	3/6	4/ each

477 823 Bink's Burettes, or Alkalimeters.

200	500	1000	1000 grains
200	100	100	200 divisions
2/6	3/	3/6	4/ each

478 824 ,, Wooden Foot 6d. Loaded Foot 1/ each extra.

479 825 ,, On Glass Foot, for Estimation of Ammonia in Gas Liquor, 2 oz., divided into 32 parts ... £0 4 0

480 826 Faraday's Alkalimeter, 1000 grains, graduated into 100 divisions each 0 2 0

,, ,, 200 divisions ,, 0 3 0

481 827 Gay Lussac's Burette.

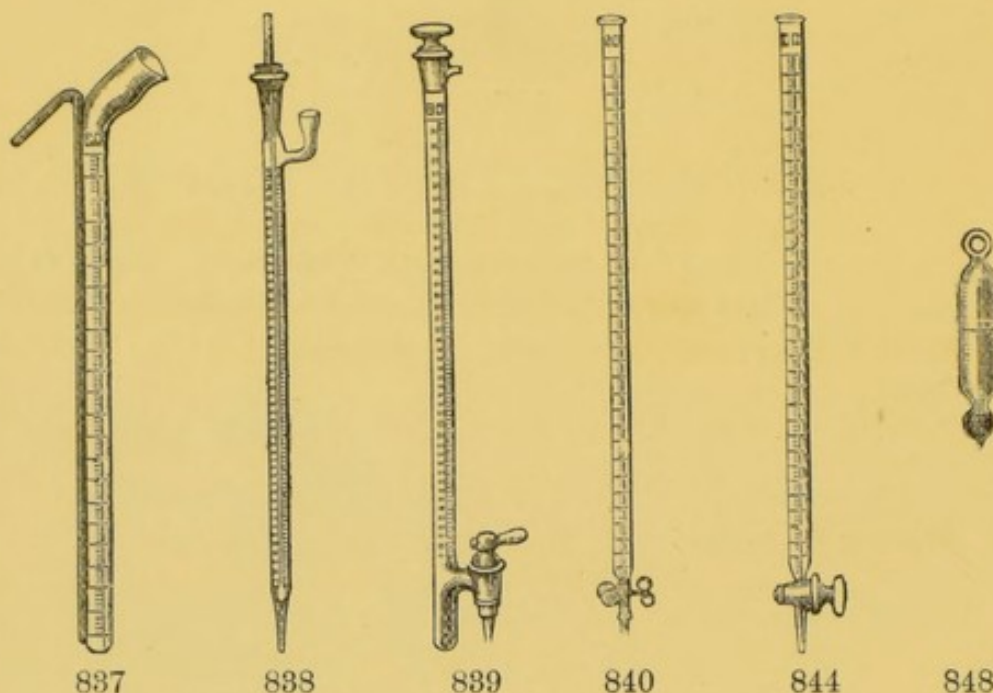
1,000 grains, graduated into 100 divisions	...	..	0 3 6
50 cc. ,, 250 ,,	...	..	0 4 0
50 cc. ,, 500 ,,	...	..	0 4 6

482 828 Wooden Foot extra ,, 0 1 0

483 829 Eggertz's Carbon Tubes, 30 c.c., graduated into 1-10th, with two Plain Tubes, same dimensions—the set 0 5 0

Old
Cat.No.

484	830	Carbon Tubes, 10 cc., in 100 divisions, with two Plain Tubes, same dimensions the set	£0	2	3
	831	20 c.c., in 200 divisions, ditto ,,	0	2	6
485	832	Only graduated 20 c.c., in 200 divisions each	0	2	0
	833	15 c.c., in 150 ,, ,,	0	1	9
485A	834	10 c.c., in 100 ,, ,,	0	1	6
486	835	200 grains, into 200 divisions with two Plain Tubes, same dimensions—the set	0	3	0
487	836	Only graduated 200 grains, in 200 divisions—each	0	2	0



488	837	Rammelsberg Burette, 50 c.c., into 1-10th ... each	£0	5	0
489	838	Rammelsberg Burette, with Glass Rod throughout, Stopped and Side Tube, 50 c.c., in 1-5th—each	0	5	0
490	839	Geissler's Burette, with Stopcock, Stopped at the top, and Cavity at the side, for volatile solutions, &c.			
		50 Cubic Cent., graduated into $\frac{1}{5}$ each	0	7	0
		50 ,, ,, $\frac{1}{10}$,,	0	7	6
		100 ,, ,, $\frac{1}{10}$,,	0	8	0
		100 ,, ,, $\frac{1}{20}$,,	0	8	6
		100 ,, ,, $\frac{1}{50}$,,	0	9	0
491	840	Mohr's Burettes, with Pinchcock, Caoutchouc Tube, and Glass Jet.			
		200 grains graduated into 200 divisions ... each	£0	2	3
		250 ,, 125 ,, ... ,,	0	2	6
		500 ,, 100 ,, ... ,,	0	3	0
		500 ,, 250 ,, ... ,,	0	3	6
		1,000 ,, 100 ,, ... ,,	0	4	0
		1,000 ,, 200 ,, ... ,,	0	4	3
		1,500 ,, 150 ,, ... ,,	0	5	0
		1,500 ,, 300 ,, ... ,,	0	6	0

Old
Cat.No.

492	841	Mohr's Burettes, cubic centimetres, with Pinchcock, Glass Jet, &c.						
		10 graduated into $\frac{1}{10}$ divisions	...	each	£0	2	0	
		20 " $\frac{1}{5}$ "	...	"	0	2	0	
		20 " $\frac{1}{10}$ "	...	"	0	2	3	
		25 " $\frac{1}{5}$ "	...	"	0	2	3	
		25 " $\frac{1}{10}$ "	...	"	0	2	6	
		30 " $\frac{1}{10}$ "	...	"	0	3	0	
		50 " $\frac{1}{5}$ "	...	"	0	3	3	
		50 " $\frac{1}{5}$ "	...	"	0	3	6	
		50 " $\frac{1}{10}$ "	...	"	0	4	0	
		55 " $\frac{1}{5}$ "	...	"	0	4	3	
		55 " $\frac{1}{10}$ "	...	"	0	4	6	
		60 " $\frac{1}{5}$ "	...	"	0	4	0	
		60 " $\frac{1}{10}$ "	...	"	0	4	6	
		75 " $\frac{1}{5}$ "	...	"	0	5	0	
		100 " $\frac{1}{5}$ "	...	"	0	4	0	
		100 " $\frac{1}{2}$ "	...	"	0	4	6	
		100 " $\frac{1}{5}$ "	...	"	0	5	6	
		100 " $\frac{1}{10}$ "	...	"	0	6	0	

Can be supplied with Enamelled backs either size
20 per cent. extra to order.

493 842 " " 100 decems, with Pinchcock and Jet, 200 divisions, each 0 4 6

494	843	Mohr's Burettes, 100 septems, 100 divisions	...	each	0	3	6
		" " 100 " 200 " ...	...	"	0	4	0
		" " 100 " 500 " ...	...	"	0	5	6
		" " 100 " 100 " with stopcock		"	0	5	0
		" " 100 " 500 " " "		"	0	7	0

495 844 Mohr's Burettes, with Geissler's Glass Stopcock.

		20 cubic centimetres graduated into $\frac{1}{10}$ divisions, each			0	3	6
		25 " " $\frac{1}{5}$ " "		"	0	3	6
		25 " " $\frac{1}{10}$ " "		"	0	4	0
		30 " " $\frac{1}{10}$ " "		"	0	4	6
		50 " " $\frac{1}{5}$ " "		"	0	4	6
		50 " " $\frac{1}{10}$ " "		"	0	5	0
		55 " " $\frac{1}{10}$ " "		"	0	5	6
		60 " " $\frac{1}{10}$ " "		"	0	5	6
		100 " " $\frac{1}{2}$ " "		"	0	5	6
		100 " " $\frac{1}{5}$ " "		"	0	6	0
		100 " " $\frac{1}{10}$ " "		"	0	7	0
		200 " " $\frac{1}{1}$ " "		"	0	6	6

496 845 Mohr's Burettes, with Geissler's Glass Stopcock.

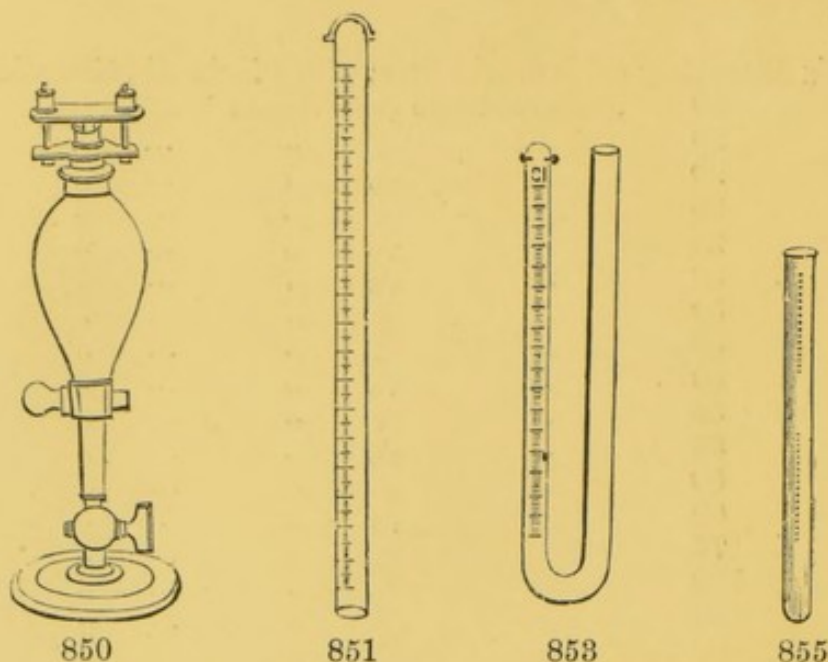
		250 grains graduated into 250 divisions	...	each	0	4	0
		500 " 250 " "	...	"	0	5	0
		1,000 " 100 " "	...	"	0	5	6
		1,000 " 200 " "	...	"	0	6	0
		1,500 " 300 " "	...	"	0	7	0

496A 846 Mohr's Burettes, with Pinchcock and Glass Jet, for Gas Ammonia Estimations, 2 oz. into 32 parts... 0 4 0

847 " " Stopcock each 0 5 6

497 848 Erdmann's Floats, for reading graduations 0 0 9

498 849 " " " " coloured glass .. 0 1 0

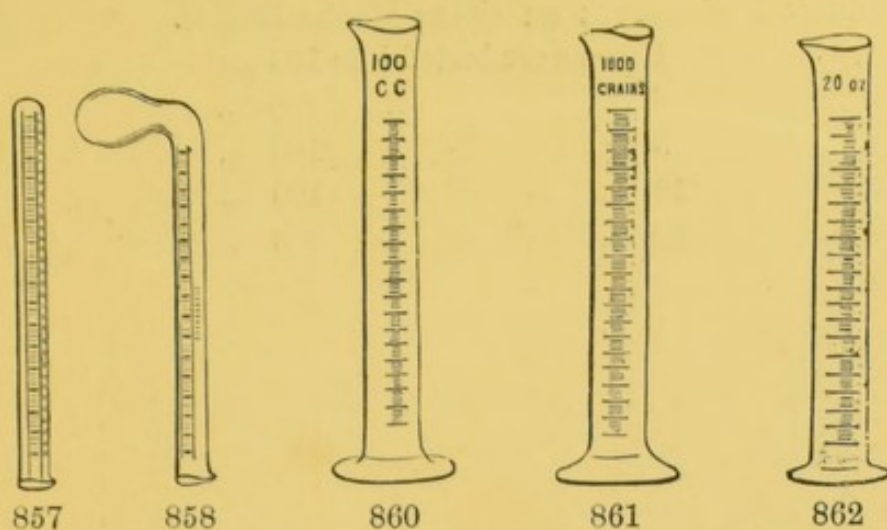


	850	851	853	855			
Old Cat.No.	850	851	853	855			
499	Eudiometer, Cavendish's, on Mahogany Stand				£1 10 0		
500	851	„ Bunsen's, graduated into millimetres.					
		300	400	500	600	800 MM Linear.	
		4/3	4/6	5/	5/6	7/ each	
500A	852	„	Volta's, 50 c.c., 100 divisions			0 4 0	
501	853	„	Ure's 1 cubic in. graduated into 100 parts, each			0 5 0	
			2	„	200	„	0 6 0
502	854	„	„ 25 cubic centimetres		50	„	0 4 6
			50	„	100	„	0 5 6

Graduated Gas Jars (See "Gas Jars," Fig. 710).

503	855	Graduated Gas Tubes, sealed at one end.				
		1 cubic inch divided into 100 parts	each		0 1 6	
		5 cubic centimetres graduated into 100 parts—	„		0 1 0	
		10	„	100	„	0 1 0
		12	„	60	„	0 1 0
		20	„	100	„	0 1 3
		25	„	125	„	0 1 6
		30	„	150	„	0 2 0
		50	„	250	„	0 2 6
		100	„	200	„	0 3 6
		200	„	200	„	0 4 0
		250	„	250	„	0 4 6

503A	856	Gravimeter, Mann's, for the Estimation of Specific Gravity of Solid Bodies, Cements, &c., consisting of Graduated Pipette with Stopcock, Flask and Stand complete, in Mahogany Box				1 1 0
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Old
Cat.No.

504	857	Bunsen's Absorption Tube, about 250 millimetres long, and graduated into millimetres—each	£0 2 0
505	858	„ „ „ with bulb „	0 2 0
505A	859	Bunte's Gas Burette, for Analysis of Furnace Gases, graduated 15 to 0 and 0 to 45 in 1/10th c.c. ...	0 15 0
		100 c.c. in 1/5th ...	0 15 0

(See Fig. 758.)

506 860 Graduated Tubes or Test Measures on Glass Foot.

	5 cubic centimetres graduated into 100 parts	...	each	0 0 8
10	„ „	100 „	„	0 0 10
25	„ „	50 „	„	0 1 0
50	„ „	100 „	„	0 1 3
100	„ „	100 „	„	0 1 6
200	„ „	100 „	„	0 2 3
250	„ or 1/4 litre	125 „	„	0 2 6
250	„ „	250 „	„	0 3 6
300	„ „	150 „	„	0 3 0
500	„ or 1/2 litre	100 „	„	0 3 0
700	„ „	100 „	„	0 4 0
1,000	„ or 1 litre	100 „	„	0 5 6
2,000	„ or 2 litre	100 „	„	0 9 0

With Enamelled Backs, either size, 20 per cent. extra, to order.

507 861 Graduated Test Measures on Glass Foot (Grains).

	100 grains graduated into 100 parts	each	0 0 9
200	„ „ 100 „	„	0 1 0
250	„ „ 125 „	„	0 1 6
500	„ „ 100 „	„	0 1 6
1,000	„ „ 100 „	„	0 2 0
1,000	„ „ 200 „	„	0 3 0
5,000	„ „ 100 „	„	0 3 0
10,000	„ „ 100 „	„	0 4 0

Old
Cat.No.

508 862 Graduated Measures on Glass Foot (Ounces).

	1 ounce graduated into 100 parts	each	£0	1	6
2	„ „ 100 „	„	0	2	0
5	„ „ 100 „	„	0	2	6
10	„ „ 100 „	„	0	3	0
20	„ „ 100 „	„	0	3	6



863



864

509 863 Graduated and Stoppered Measures, Test Mixers, on glass foot (Cubic centimetres).

	10 cubic centimetres graduated into 100 parts—each	£0	1	0
25	„ „ 100 „ „	0	1	3
50	„ „ 100 „ „	0	1	6
100	„ „ 100 „ „	0	2	6
200	„ „ 100 „ „	0	3	6
250	„ or $\frac{1}{4}$ litre „ 125 „ „	0	4	0
500	„ or $\frac{1}{2}$ „ „ 100 „ „	0	4	6
600	„ „ 120 „ „	0	5	6
1,000	„ or 1 „ „ 100 „ „	0	7	0
2,000	„ or 2 „ „ 100 „ „	0	11	6

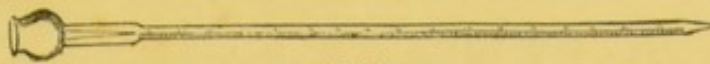
510 864 Graduated and Stoppered Test Mixers (Grains).

	500 grains graduated into 100 parts—each	0	2	0
1,000	„ „ 100 „ „	0	2	6
2,000	„ „ 100 „ „	0	3	6
5,000	„ „ 100 „ „	0	4	0
10,000	„ „ 100 „ „	0	5	0

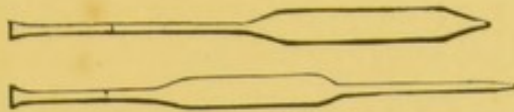
With Enamelled Backs, either size, 20 per cent. extra, to order.

510A 865 Graduated and Stoppered Test Mixers.

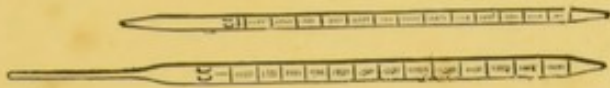
	1 decigallon 100 divisions of 10 septems.	each	0	4	6
2	„ 100 „ 20 „	„	0	7	0



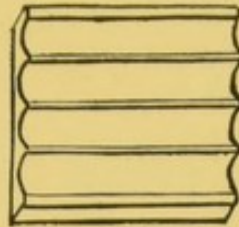
872



866



870



874



873

Old
Cat.No.

511 866 Graduated Pipettes. Cubic centimetres, gauged at one mark to deliver precise quantities.

1	2	5	10	15	20	25	30	50	70	100	cubic centimetres
3d.	4d.	4d.	6d.	7d.	8d.	9d.	9d.	10d.	11d.	1/	each

512 867 Graduated Pipettes, to deliver grains.

5	10	20	50	100	200	250	500	1,000	grains
3d.	3d.	3d.	4d.	6d.	8d.	9d.	10d.	1/	each

513 868 Graduated Pipettes, to deliver septems.

5	10	20	25	50	100	septems
6d.	7d.	8d.	9d.	1/	1/3	each

514 869 Graduated Pipettes, to deliver 1 cubic inch ... each £0 0 10

515 870 Graduated Scale Pipettes, divided into parts.

1	1 cubic centimetre graduated into	10	parts—each	0	0	8
1	"	100	" "	0	1	0
2	"	50	" "	0	1	0
5	"	25	" "	0	0	10
5	"	50	" "	0	1	0
10	"	50	" "	0	1	0
10	"	100	" "	0	1	4
20	"	100	" "	0	1	6
25	"	50	" "	0	1	6
25	"	125	" "	0	2	0
50	"	100	" "	0	3	0
50	"	250	" "	0	3	6
100	"	200	" "	0	4	0

516 871 Graduated Scale Pipettes (Grains), divided into parts.

50	10 grains divided into	20	parts ...	...	each	0	1	0
50	"	50	" "	...	"	0	1	2
100	"	100	" "	...	"	0	1	6
250	"	250	" "	...	"	0	2	0
500	"	250	" "	...	"	0	2	9
1,000	"	100	" "	...	"	0	3	0

Old
Cat.No.

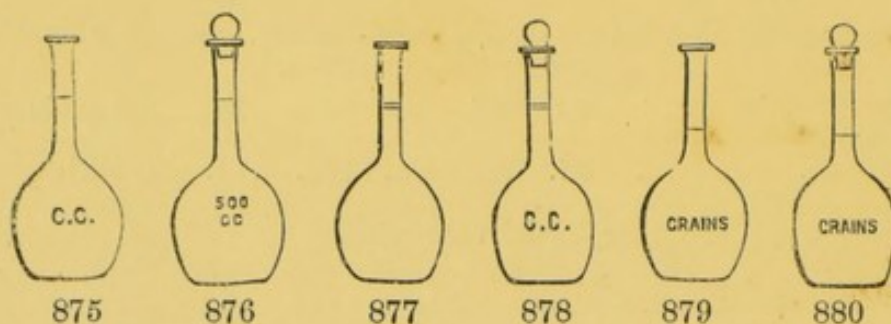
516A 872 **Graduated Funnel Pipettes**, with Caoutchouc Top for delivering test solutions in small quantities; 50 c.c. in $\frac{1}{2}$ c.c. £0 3 6

873 **Pipette** fitted with Stopcock and upper Bulb with Tubes for drawing off poisonous liquids without going into the mouth.

Capacity lower Bulb marked—

5	10	20 c.c
4/	4/3	4/6 each

517 874 **Porcelain Fluted Rest**, for Pipettes, with 4 flutes each 0 1 6



518 875 **Graduated or Marked Flasks**, gauged at one mark in the neck to deliver precise quantities.

10 cubic centimetres	...	...	...	...	each	£0 0 4
25	"	...	...	...	"	0 0 5
50	"	...	...	...	"	0 0 6
70	"	...	...	...	"	0 0 8
100	"	...	...	...	"	0 0 8
150	"	...	...	...	"	0 0 9
200	"	...	...	...	"	0 0 10
250	"	or $\frac{1}{4}$ litre	...	...	"	0 1 0
300	"	...	...	...	"	0 1 2
500	"	or $\frac{1}{2}$ litre	...	...	"	0 1 2
700	"	...	...	...	"	0 1 4
1,000	"	or 1 litre	...	...	"	0 1 6
2,000	"	or 2 litres	...	...	"	0 2 6

519 876 **Graduated Flasks**, with one mark, stoppered.

25 cubic centimetres	...	...	...	...	each	0 0 7
50	"	...	...	...	"	0 0 8
100	"	...	...	...	"	0 0 10
150	"	...	...	...	"	0 1 0
200	"	...	...	...	"	0 1 3
250	"	or $\frac{1}{4}$ litre	...	...	"	0 1 6
300	"	...	...	...	"	0 1 8
500	"	or $\frac{1}{2}$ litre	...	...	"	0 1 9
1,000	"	or 1 litre	...	...	"	0 2 3
2,000	"	or 2 litres	...	...	"	0 3 0

Old
Cat.No.

520	877	Graduated Flasks, with two marks in neck.							
		50 and 55 cubic centimetres	...	...	...	...	each	£0 0 9
		100 „ 110	„	...	...	...	„	0 1 0
521	878	Graduated Flasks, Geissler's, with two marks for measuring and pouring.							
		100 cubic centimetres, plain, each	1/	stoppered, each				0 1 3	
		200	„	„	1/3	„		0 1 6	
		250	„	„	1/6	„		0 1 9	
		500	„	„	1/9	„		0 2 0	
		1,000	„	„	2/	„		0 2 6	
522	879	Graduated Flasks, with one mark (Grains).							
		500	1,000	1,500	2,000	5,000	10,000	20,000 grains	
		10d.	1/	1/2	1/3	1/6	1/9	2/6 each	
523	880	Graduated Flasks, with one mark, stoppered.							
		500	1,000	1,500	2,000	5,000	10,000	20,000 grains	
		1/	1/3	1/4	1/6	1/9	2/	2/9 each	
524	881	Graduated Flasks (Decigallon).							
		1/2	decigallon, with one mark, 10d. ; stoppered	each				£0 1 0	
		1	„	„	1s. 3d.	„	„	0 1 9	
525	882	Graduated Flasks (Ounces).							
		5 ounces, one mark, 1s. 3d. ; stoppered	...	each				0 1 6	
		10	„	„	1s. 6d.	„	...	0 1 9	
		20	„	„	1s. 9d.	„	...	0 2 0	



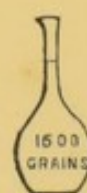
883A



883B



884

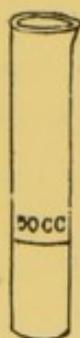


885

526	883	Standard Measure Flasks or Receivers, as used at H.M. Customs for the Estimation of spirit in Wines, either form, A or B							... .. each	0 1 6
527	884	Standard Measures or Receivers, with mark at 1,600 grains, as used at H.M. Inland Revenue, for taking the Original Gravities of Beer—each								0 1 3
528	885	Standard Measures or Receivers, Pear Shape, Thin Glass, with Lip and Narrow Neck for greater accuracy—each								0 2 0



885A



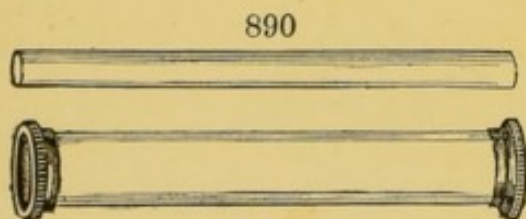
888



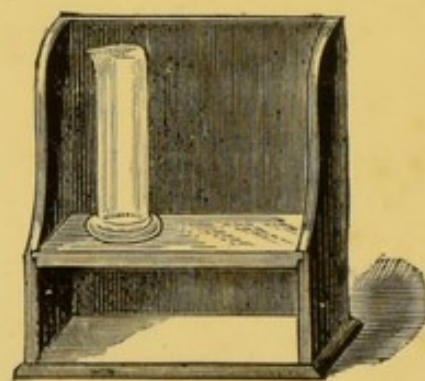
889

Old
Cat.No.

885A	Graduated Tube, Dr. Muter's, with Stopcock and Stopper, on wooden foot, for Oleic Test, graduated to 200 c.c.	£0 7 6
529 886	Nessler Glasses, colourless glass and polished ends, for Water Analysis, Plain each	0 0 10
529A 887	„ „ length 24 in. „	0 5 0
530 888	Graduated one mark at 50 c.c., 1/; two marks 50 & 100 c.c.	0 1 2
531 889	Graduated Nessler Tubes, with Stopcock, 100 c.c. into 10 parts, as recommended by Dr. Hehner—each	0 5 0

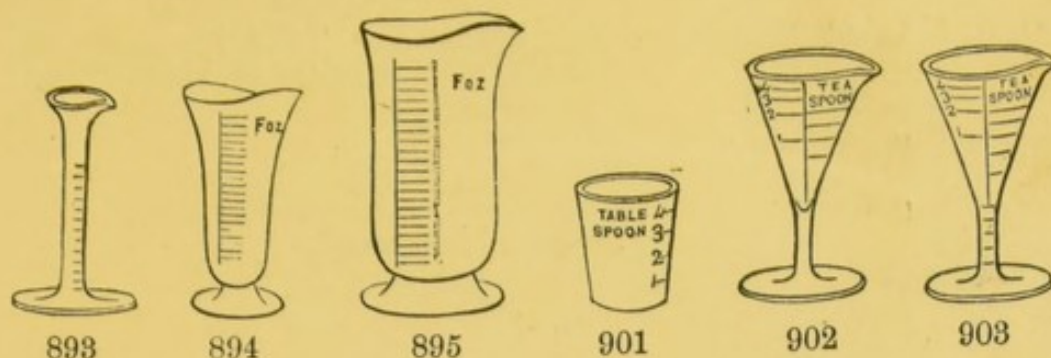


891



892

531A 890	Glass Tube, for Nessler Test, 24 in. × 1 in. ... each	£0 1 6
531B 891	„ with Brass Screw, Cap, and Collar, and Glass Plates at the ends, 24 in. × 2 in. ... each	0 15 0
531c 892	Black Wood Stand, with Plate Glass Shelf in centre and White Opaque Glass at the bottom for use in Nessler Test, by Gas or Day-light ... each	0 3 6



Old
Cat.No.

Graduated Measures, Minims, Drams, and Ounces,
conical form to 4 ozs., cylindrical upwards, English glass.

532	893	1 dram, conical or cylindrical form	...	...	each	£0 0 8
		2 " " " "	...	...	"	0 0 9
533	894	1 ounce, conical	...	...	"	0 0 8
		2 " " " "	...	...	"	0 0 10
		4 " " " "	...	...	"	0 1 3
534	895	5 " cylindrical form ($\frac{1}{4}$ imperial pint)	...	...	"	0 1 4
		6 " " " "	...	...	"	0 1 6
		8 " " " "	...	...	"	0 1 9
		10 " " " ($\frac{1}{2}$ imperial pint)	...	...	"	0 2 0
		16 " " " "	...	...	"	0 2 3
		20 " " " (1 imperial pint)	...	...	"	0 2 6
		40 " " " (1 " quart)	...	...	"	0 4 6
		80 " " " (2 " " )	...	...	"	0 10 6
		160 " " " (1 " gallon)	...	...	"	0 15 0

Minims, Drams, and Ounces, with Official Stamp—

532A	896	1 dram, cylindrical form	...	...	...	0 1 0
		2 " " " "	...	...	...	0 1 1
533A	897	1 ounce, conical form	...	...	...	0 1 0
		2 " " " "	...	...	...	0 1 2
		4 " " " "	...	...	...	0 1 6
534B	898	6 " cylindrical form	...	...	...	0 1 10
		8 " " " "	...	...	...	0 2 3
		10 " " " ($\frac{1}{2}$ imperial pint)	...	...	...	0 2 6
		16 " " " "	...	...	...	0 3 0
		20 " " " (1 imperial pint)	...	...	...	0 3 9
		40 " " " (1 imperial quart)	...	...	...	0 5 6

534c 899 **Graduated Measures, Conical, similar to Fig. 894.**

50	100	150	250 cubic cent.
$\frac{1}{3}$	$\frac{1}{6}$	$\frac{1}{9}$	3/ each

534D 900 **Graduated Measures, Cylindrical, similar to Fig. 895.**
German Glass.

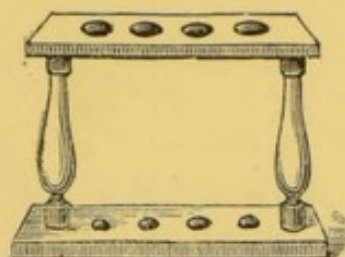
4 ounces, graduated into 8 divisions	...	...	each	0 1 0
5 " " 10 " "	...	...	"	0 1 2
8 " " 16 " "	...	...	"	0 1 4
10 " " 20 " "	...	...	"	0 1 6
20 " " 40 " "	...	...	"	0 2 0

Old
Cat.No.

535	901	Graduated Measures, Tea Spoon and Table Spoon, Tumbler form, moulded 9d, blown	£0 1 0
536	902	„ „ Wineglass form	0 1 0
537	903	„ „ „ hollow stem, graduated into minims ... each	0 2 0



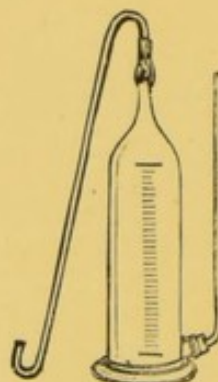
904



905



906



907

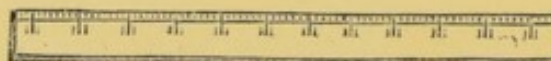


908

538	904	Graduated Cream Tubes, for showing the percentage of cream in milk each	£0 1 0
538A	905	Mahogany Stand to hold four tubes „	0 1 6
1608	906	Cremometer with stopcock, Chevalier's „	0 6 0
539	907	Graduated Gas Holder, Bunsen's, for mercury, divided into about 150 millimetres each	0 5 0
539A	908	Gas Holder, Bunsen's, for mercury, with Glass Stopcock, divided into about 160 millimetres each	0 7 6



909



910

540	909	Graduated Measures of Length, Boxwood, with 6 joints, marked in cubic metres, millimetres, and corresponding English inches each ... 1/ and	£0 2 0
541	910	„ „ Boxwood, straight, about 12 in. in length, divided into cubic metres, millimetres, and corresponding English, German, and Austrian inches ... each	0 2 6



911

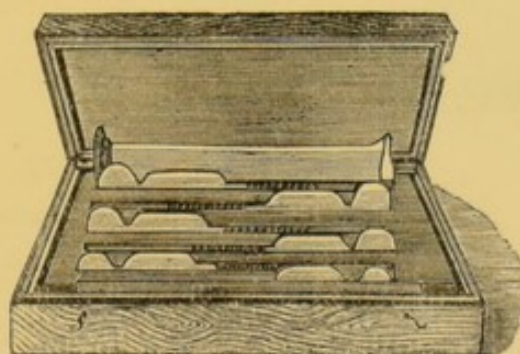


920

HYDROMETERS,

For ascertaining the Density of Acids, Solution of Salts, Vegetable Infusions, Spirits, Ethers, Petroleum, &c., calculated at 60° F. temperature.

<p><small>Old Cat No.</small></p>	<p>542 911 Specific Gravity Hydrometer, for Acids, &c., heavier than Water, scale divided in tens, 1,000 to 1,900, in Cardboard Case each</p> <p>543 912 .. for closer determinations, scale divided in twos, 1,000 to 1,300, 1,300 to 1,600, 1,600 to 1,900, in cases each</p> <p>544 913 .. scale 1,000 to 1,500, and 1,500 to 2,000, in fives ..</p> <p>545 914 .. Spirits, Ethers, and Liquids lighter than Water, scale 700 to 1,000, divided in fives, in cases—each</p> <p>546 915 .. scale divided in twos</p> <p>546A 916 .. Specific Gravity, 700 to 800, 800 to 900, &c., to 2,000 in separate spindles, each containing 100 degrees in single divisions</p>	<p>£0 2 6</p> <p>0 3 0</p> <p>0 2 6</p> <p>0 2 6</p> <p>0 3 0</p> <p>0 2 6</p>
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917

<p>546B 917 Specific Gravity Hydrometers, set of 4 spindles, 700 to 1,000, 1/1300, 13/1600, 16/2000, in single degrees, with Thermometer and Trial Glass, in Polished Mahogany Case, lined, each piece fitted</p>	<p>£1 7 6</p>
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Old
Cat.No.

546c 918 **Specific Gravity Hydrometers**, Set of 7 spindles, 700 to 850, 850 to 1,000, 1/1200, 12/1400, 14/1600, 16/1800, 18/2000, in single degrees, with Thermometer and Trial Glass, in Polished Mahogany Case, lined and fitted ... £1 17 6

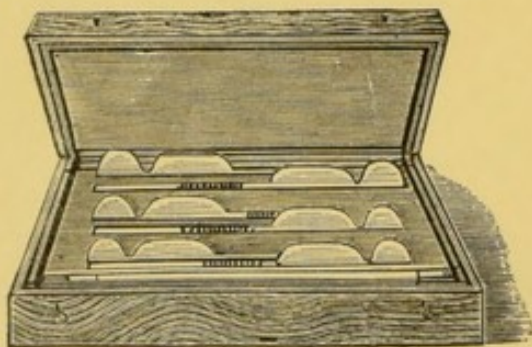
547 919 **Twaddell's Hydrometers**, for Liquids heavier than Water. Each degree is equal to 5° specific gravity; to find the equivalent multiply by 5 and add 1,000, thus:—

$$42 \times 5 = 210 + 1,000 = 1.210 \text{ Sp. Gr.}$$

Number	Twaddell's Scale.	Specific Gravity.
1	0 to 24	= 1.000 to 1.120
2	24 to 48	= 1.120 to 1.240
3	48 to 74	= 1.240 to 1.370
4	74 to 102	= 1.370 to 1.510
5	102 to 138	= 1.510 to 1.690
6	138 to 170	= 1.690 to 1.850

Either number in Cardboard Case each 0 1 4

548 920 **Twaddell's Hydrometers**, small size, length of spindle 6 inches, for taking the gravity of smaller quantities, same numbers and scale each 0 1 4



921



926

548A 921 **Twaddell's Hydrometers**, Set of 6 Spindles, with Thermometer and Trial Jar, in Polished Mahogany Case, lined and fitted 1 0 0

549 922 **Hydrometers**, for Petroleum Spirit, Light Oils, &c., small for testing samples, length of scale about 3 in. marked into single degrees:—650° to 700°, 700° to 750°, 750° to 800°, 800° to 850°, 850° to 900°, 900° to 950°, 950° to 1000°. In Cases each 0 1 9

Old
Cat.No.

- 550 923 **Beaume's Hydrometers**, for Heavy Liquids, Acids, Soap
Leys, Syrups, 0 to 70°, 0 to 25°, 25° to 50°, In Card-
board Cases each £0 1 6
,, For Liquids lighter than Water, 10 to 60° ... ,, 0 1 6

Comparative Scale of Beaume's Hydrometers for Heavy Liquids.

Beaume.	Specific Gravity.	Beaume.	Specific Gravity.
0	1·000	40	1·385
10	1·075	50	1·532
20	1·161	60	1·714
30	1·263	70	1·946

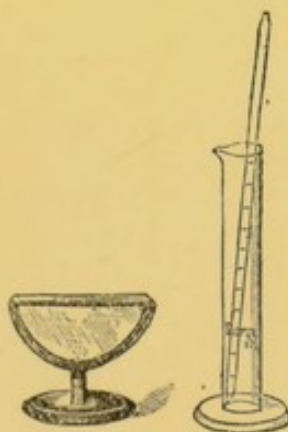
For Light Liquids.

40	·817	26	·892
36	·837	20	·928
30	·871	10	1·000

- 551 924 **Hydrometer for Spirits**, Sikes' Proof Scale, 45° underproof
to 65° overproof. In Cardboard Cases, each 0 2 6
551A 925 ,, Nicholson's, for taking Specific Gravity of
Solid Bodies. Japanned Tin 0 4 6
551B 926 ,, ,, ,, Polished Brass 0 6 0



927



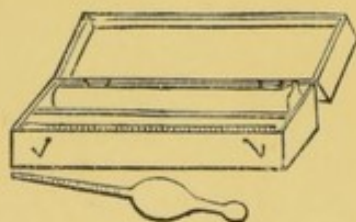
930



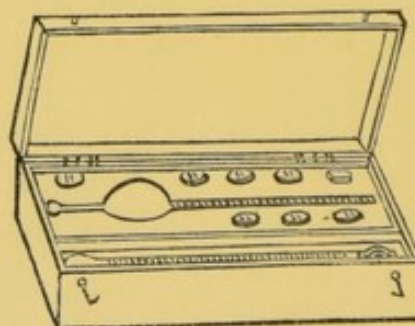
931

- 552 927 **Lactometer, or Milk Tester**, with Jar and Case, Small, each £0 1 3
553 928 ,, ,, ,, Larger ,, 0 2 0
554 929 ,, ,, Centesimal Scale, without Jar ,, 0 2 0
554A 930 **Lactoscope Vogel**, consisting of two pieces of colourless
plate glass mounted on brass frame, Trial Jar about 300
Septems capacity, with mark at 100 Septems, and a pipette
holding 10 Septems graduated into ½ Septems, set complete 0 6 0
The Trough only 0 3 6

Old Cat.No.								
554B 931	Lactoscope, French, with moveable diaphragm, for Optical Test	...	...	...	...	...	...	£0 2 6
555 932	Cartier's Hydrometer, in Case	...	...	...	...	each		0 2 0
556 933	Oleometer, for Linseed, Rape, Sperm, Olive, &c., the standard qualities of which are indicated on the scale. In Case	...	..	...	...	...	each	0 2 6
557 934	Argentometer, for Testing the Strength of Nitrate of Silver in Solution, for Photographic use, with Glass Jar. In Case complete	...	...	...	...	...	each	0 2 6
558 935	Saccharometer, for Brewers' use, with directions. Showing pounds per Barrel. In Case	...	...	...	...	each		0 2 6
558A 936	„ for Brewers' use, for taking the Specific Gravity of Beer. Graduated into single degrees, 1,040 to 1,080, and 1,080 to 1,125. In Cardboard Case	...	...	...	...	each		0 2 6
558B 937	Bates' Saccharometer, Gilt, with Weights and Thermometer, as used at the Inland Revenue Laboratory. In polished Mahogany Case	...	...	...	...			4 0 0
558c 938	„ Best Make, Doubly Gilt and Best Finish	...	...	...	...			4 10 0
938A	„ Small size, for Pocket	...	...	...	...			2 0 0
559 939	Barkrometer. In Case	...	...	...	...	each		0 2 6
560 940	Ammoniometer	„	...	...	...	„		0 2 6
561 941	Salinometer	„	...	...	...	„		0 2 6



945



946

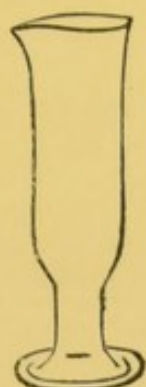
562 942	Urinometer, for Medical use. In Leather Case	...	each	£0 3 0
	„ In Case Complete, with Plain Immersion Tube	„	„	0 5 0
	„ „ „ Graduated	„	„	0 5 6
562A 943	„ Immersion Tubes, only Plain	...	„	0 0 6
562B 944	„ „ „ „ Graduated	...	„	0 1 2
563 945	„ With Graduated Immersion Tube and Thermometer. In Leather Case Complete	...	each	0 12 6

Old
Cat.No.

- 564 946 Sikes' Revenue Hydrometer, Doubly Gilt, with Weights, Thermometer, and Book of Tables, Complete for ascertaining the Specific Gravity of Wines and Spirits. In Polished Mahogany Box ... each £3 3 0
- 565 947 Keene's Registered Hydrometer, without Weights, as used at H.M.'s Customs, for ascertaining the Specific Gravity of Wines. In Mahogany Case ... each 3 0 0
- 566 948 ,, Thermometer for the above. In White Metal Case 0 18 0



949



950



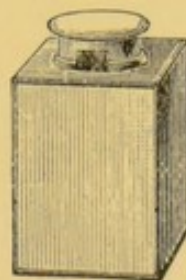
951

- 567 949 Hydrometer Immersion Tubes, White Glass, with Spout.
- | | | | | | | | | | |
|-------|-------|-------|----|-------|-----|-------|-----|-------|--------------|
| 6 | 8 | 10 | 10 | 12 | 12 | 12 | 14 | 14 | in. height |
| 1 1/4 | 1 1/2 | 1 5/8 | 2 | 1 3/4 | 2 | 2 1/2 | 2 | 2 1/2 | in. diameter |
| 7d. | 9d. | 10d. | 1/ | 1/ | 1/2 | 1/6 | 1/3 | 1/6 | each |
- Other sizes made to order.

- 568 950 Hydrometer Immersion Tube, or Trial Glass, with Hollow Stem for Sykes' Hydrometer ... each 0 1 3
- Ingot Moulds (see Assay Apparatus.)
- 568A 951 Ink, Sabatier's, for writing on glass, in Gutta Percha bottle 0 1 6



952



953

- 569 952 Stoneware Jars, with Ground Air-tight Covers, for Storing Dry Chemicals
- | | | | | | | | |
|-----|----|-----|-----|-----|----|-----|-----------------|
| 1 | 2 | 3 | 4 | 6 | 8 | 12 | quarts capacity |
| 1/6 | 2/ | 2/3 | 2/6 | 3/3 | 4/ | 5/6 | each |
- 569A 953 Tin Canisters, wide mouth, stout, with covers and bayonet catch, for dry Chemicals, square—
- | | | |
|----|----|----------------|
| 1 | 2 | gall. capacity |
| 2/ | 3/ | each |



954

955

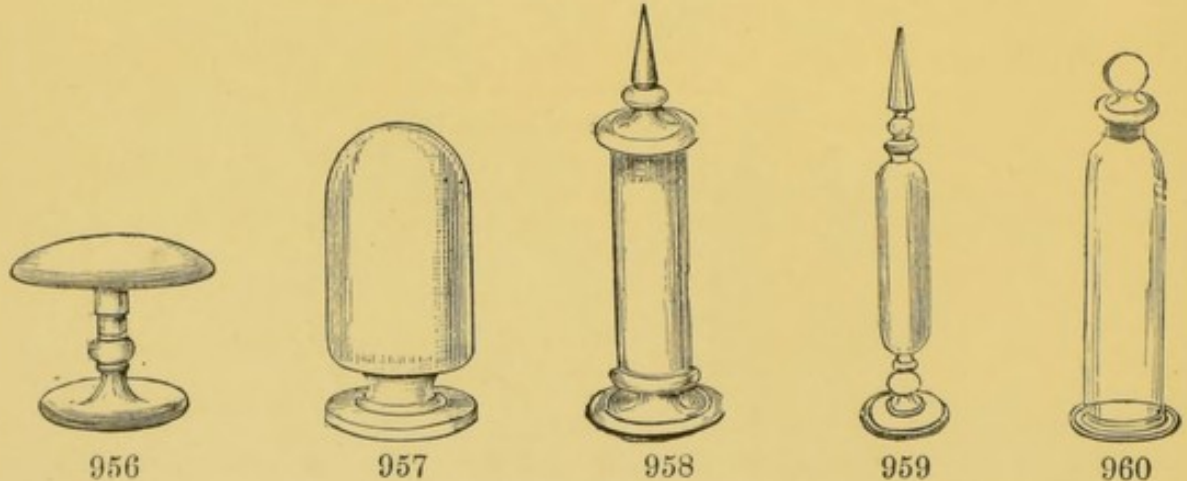
Old
Cat.No.

570 954 Glass Jars, Stopped, for Anatomical Specimens, Samples, &c.
Bohemian White Glass.

4½	6	5½	7½	6½	6½	9½	9½ in. height
1¼	1½	2¾	2	3½	4¾	2¾	4½ in. diameter
6d.	10d.	1/2	1/3	1/9	2/6	2/	3/ each
12½	10½	16	16	21	21	17	17 in. height
4	5¾	4¾	6¼	7½	8½	10	10 in. diameter
3/6	5/6	6/6	10/	15/	20/	25/	each

Any other intermediate sizes made to order.

570A 955 Glass Jars, for Anatomical Specimens, with Glass Hooks
in Stopper for suspension—same sizes as
above... .. 6d. to 1s. each extra



956

957

958

959

960

570B 956 Specimen Glasses, Table form, white, colourless, for
exhibition of Specimens, Crystals, &c., broad
Foot Stopped into Top—

Diameter of Top	...	4 in.	5½ in.
		2/	2/6 each

Old
Cat.No.

570C 957 Specimen Glasses, Bohemian Glass, Dome Shape, for Show Cases, Crystals, &c., with polished Stopper for base—

4	8	12	16	30	40 oz. about capacity
8d.	10d.	1/	1/6	2/	3/ each

570D 958 ,, Cylindrical, with broad Foot, cut and polished Top, loose—
Height to shoulder 12 in. ; Diameter 2½ in.—each £0 4 0

570E 959 ,, Cylindrical form, narrow mouth, cut and polished Stopper, for Oils, &c.—
Height to top of Stopper 16 in. ; Diameter 1½ in.—each 0 3 0

570F 960 ,, Cylindrical, plain Stopper, height to top of Neck, exclusive of Stopper—

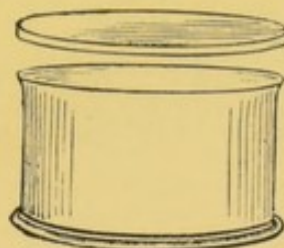
7 × 1	10 × 1½	12 × 1½	13 × 2	16 × 2½	16 × 3¾ inches
1/3	1/6	2/	3/	4/	6/ each

Corresponding with sizes of Stoppered Test Mixers 50 c.c. to 1,000 c.c.

Other Sizes of all the above made to order.



961



962

570G 961 Specimen Jars, Cylindrical, White Bohemian Glass, welted top form, with Stout Glass Cover ground to fit, for Anatomical Specimens, Samples, &c.—

2¾	3¼	4	4	3¼	5½	4	3¼ in. height
¾	1	1¼	1½	1¾	2	2¼	2¾ in. diameter
6d.	8d.	10d.	1/	1/	1/3	1/3	1/3 each
5½	4	4	6	7¼	6¼	6¾	in. height
2¾	2¾	3½	3½	3½	5¼	6	in. diameter
1/6	1/9	2/6	3/	3/6	5/6	8/	each

570H 962 ,, Strong Glass, shallow form, welted top, with stout Glass Cover ground to fit—

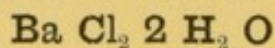
3 × 3	3¼ × 3¼	6¼ × 4	7 × 4¾	8½ × 4¾	10¼ × 5½ inches
1/8	2/3	7/	8/	12/	15/ each

Other Sizes made to order.

Old
Cat.No.

571 963 Labels for Reagents, gummed, large type, new notation with symbols, in sheets containing 100 labels—each £0 0 6

SPECIMEN

**BARIUM CHLORIDE**

572 964 Labels, in books containing upwards of 400 Labels, large type, with symbols for all the Principal Reagents used in Laboratories, and other substances, ends of Labels perforated for convenience of cutting, in book with stout cover each 0 1 0

573 965 „ plain, gummed, in packets containing 100, each 4d., 6d., and 8d.

574 966 Ladles, Wrought Iron, with Handle 12 to 16 inches long, each 8d., 10d., 1/, 1/3, and 1/6.



967



968



969



970



971

LAMPS FOR SPIRIT.

575 967 Glass, with Ground Glass Cap and Earthenware Wick Holder.

Capacity 1 oz.	...	...	...	each	£0 0 9
„ 2 „	...	...	...	„	0 0 10
„ 4 „	...	...	...	„	0 1 4
„ 8 „	...	...	...	„	0 1 4

576 968 „ with Ground Glass Cap and Brass Screw Wick Holder.

Capacity 1 oz.	...	...	...	each	0 1 3
„ 2 „	...	...	...	„	0 1 6
„ 4 „	...	...	...	„	0 1 9
„ 8 „	...	...	...	„	0 2 0

577 969 „ „ Earthenware Wick Holder, and Stopper at the side.

Capacity 4 oz.	...	...	...	each	0 1 6
„ 8 „	...	...	...	„	0 2 0

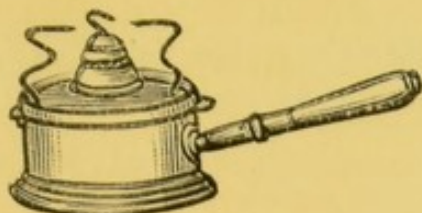
578 970 „ „ Shallow, with Broad Base.

Capacity about 2 oz.	...	...	...	„	0 1 0
„ „ 4 „	...	...	...	„	0 1 6

578A 971 „ Berlin Porcelain „ „ 4 „ 0 2 6



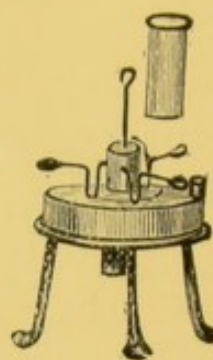
972



974



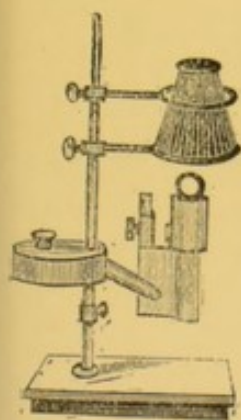
975



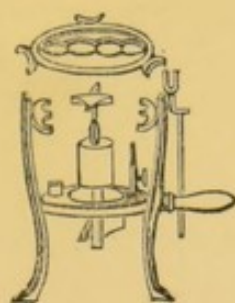
976

Old
Cat.No.

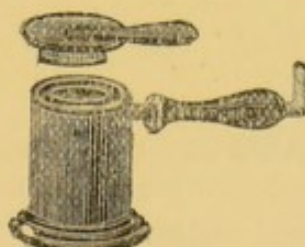
579	972	Lamp, Tin Spirit, Double Current, for Quick Boiling, Evaporating, &c., with Support, 2 Rings, and Hot Plate for Dishes, &c., capacity 8 oz. each	£0	2	6
580	973	„ Copper „	0	5	0
580A	974	„ Argand Spirit, White Metal, with strong Wire Supports for Flasks, &c., and Metal Top, with Screw each	0	4	6
580c	975	„ French Spirit, Blowpipe, with Brass Spirit Lamp, Copper Reservoir, and Safety Valve, for bending Glass Tube, soldering or heating substances.			
		No. 1 2 3			
		4/ 4/6 5/6 each			
581	976	„ Rose's Argand Spirit, Tripod Stand and Copper Chimney, with arrangement for Raising and Lowering the Wick, Japanned Tin, each 9/, 12/ and	0	14	6



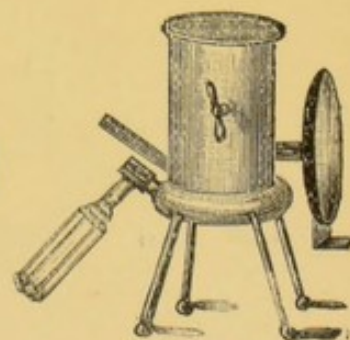
977



979



980



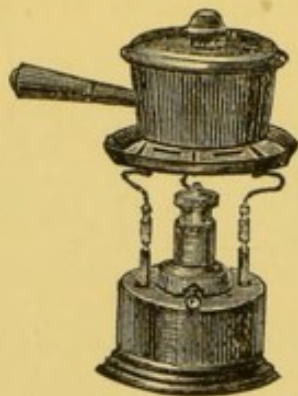
981

582	977	Lamp, Berzelius' Argand Spirit, Brass, with Rod on Porcelain Foot, Brass Rings and Chimney ...	£1	0	0
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Old
Cat.No.

583	978	Lamp, Mitcherlech's Argand Spirit, similar in construction to Fig. 977, with Blast Tubes, which may be attached to Foot Bellows to obtain greater heat for Fusions, &c.	£1 15 0
584	979	„ Luhme's Argand Spirit, with Porcelain Handle, Brass Support, Rings, and Chimney, 16/, 22/6 & Wicks for the above, per doz. 8d., 10d., 1/, and	1 6 0 0 1 6
585	980	„ Vertical or Russian Brass Blast, Brazed, for Fusions, &c. 8/ and	0 14 6
1665	981	„ Magnesium Portable, Brass, with reflector 3½ in. diam. and Clockwork arrangement	1 5 0

In Use



982

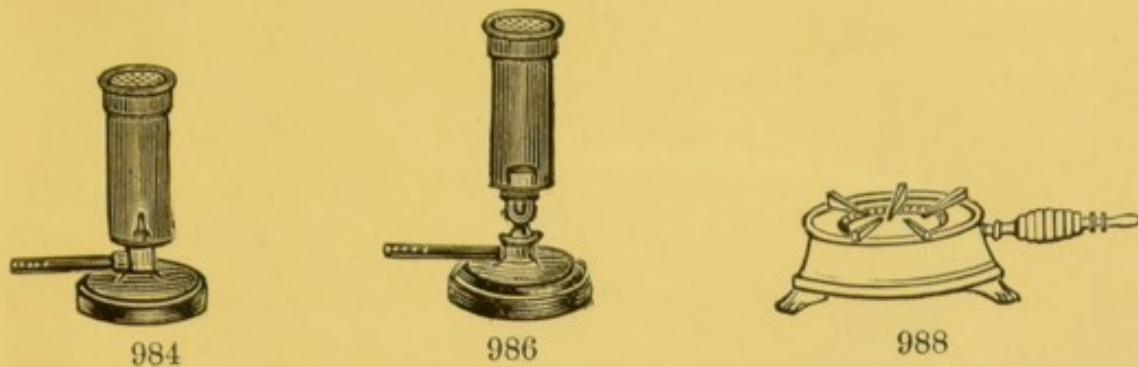


983

982 Lamp, Richaud's Spirit, 3-Flame Travelling, with Boiler complete. Can be taken to pieces and packed in Boiler—

Tin	...	Capacity of Boiler	¾ Pint	...	each	£0 5 0
Nickel	...	„	½ „	...	„	0 10 6
Copper	...	„	1 „	...	„	0 10 6

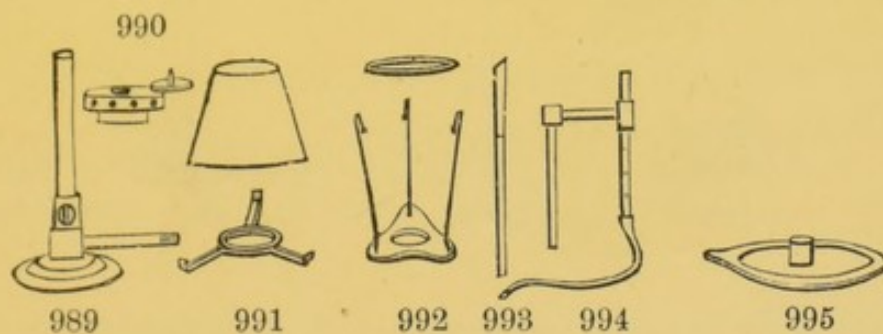
983	„	Swedish Patent Benzoline Blast, very powerful, for heating up to about 2,000° Fah. Bending Hard Glass Tube, Soldering, Ignition, &c. Absolutely safe from explosion, easily regulated, and will last in constant use for years; when filled with Benzoline will last for two or three hours	1 1 0
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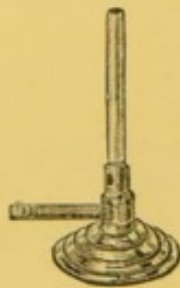
L A M P S .

For Gas and Air, Argand and Gauze Burners.

Old Cat.No.	984	Gauze Gas Burner, with Plain Jet, Gauze Cap, and Brass Chimney	£0 5 6
587	985	Gauze Argand Gas Burner, with Brass Chimney, 7/ and		0 8 6
588	986	" " " Stopcock ... 8/ and		0 10 0
588A	987	" " with Stopcock and Mahogany Foot		0 10 0
588B	988	Gas Boiler, Cast Iron, made flat, suitable for Evaporations.		
		No. 1	2	3
		3/	3/6	5/ each



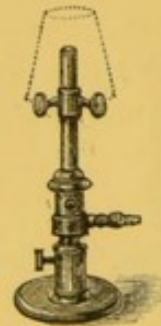
589	989	Bunsen's Gas Burner, for Gas and Air, with Regulator, Brass Tube on Iron Foot, Best Make.			
		Diameter of Burner	... .. $\frac{3}{8}$ in.	$\frac{1}{8}$ in.	$\frac{3}{4}$ in.
			1/3	2/6	3/6 each
590	990	Rose Top to Fit	... .. 10d.	1/3	1/6 ..
591	991	Star Support and Chimney	... .. 6d.	8d.	10d. ..
592	992	Ring Support	... .. 1/3	1/6	2/ ..
593	993	Plain Blowpipe Jet	... .. 4d.	6d.	9d. ..
594	994	Herapath's Blowpipe to fit, with India Rubber Tube and Bone Mouthpiece	2/6	2/9	3/ ..
	995	Complete Set	... .. 6/6	9/	11/
595	996	Porcelain Ash Tray for Star Support, to fit Bunsen's Burner	... ..	each	£0 1 3
596	997	Small Iron Crucible Jackets, adapted to Bunsen's Burner	... ..	per pair	0 1 3



998



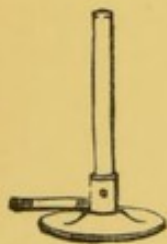
999



1000

Old
Cat.No.

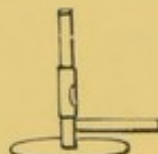
596A	998	Bunsen's Gas Burner, with regulator— Solid Brass, best Nickel-plated, $\frac{3}{8}$ in., each	£0 3 6
596B	999	„ „ Improved, with regulator and cone for adjusting the flame and supply of gas and air, $\frac{3}{8}$ in. each	0 3 6
596c	1000	„ „ Improved, with Sliding Rod and Adjusting Screw each	0 4 6



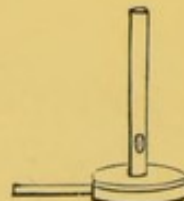
1001



1002



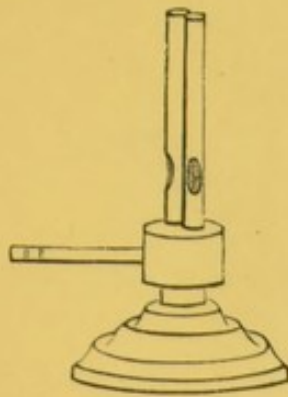
1003



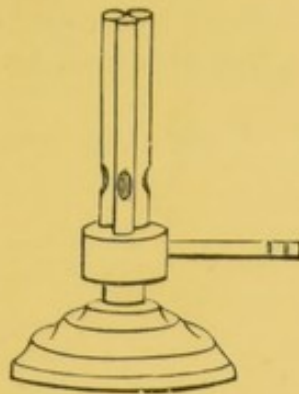
1004



597	1001	Bunsen's Burners, without Regulator, Brass Tube and Iron Foot.	
		Diameter of Tube $\frac{3}{8}$ in. each	£0 1 0
		„ „ $\frac{9}{16}$ „ „	0 1 6
		„ „ $\frac{3}{4}$ „ „	0 2 0
598	1002	Iron Roses to fit the above—each 6d., 9d., & These can be used with the best Burners.	0 1 0
599	1003	„ Small, Brass, height 3 in., light make—each	0 1 0
600	1004	„ Small, portable, in three pieces, diameter of Tube $\frac{5}{8}$ in. each	0 2 6
600A	1005	Asbestos Millboard, for use on Hot Plate over Bunsen's Burner, &c., instead of Wire Gauze, Sand Dishes, &c.—	
		4 × 4 5 × 5 6 × 6 inches	
		3d. 4d. 5d. each	



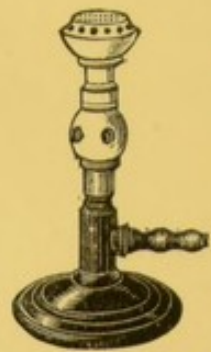
1006



1007



1011



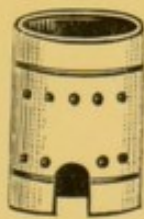
1012

Old
Cat.No.

602	1006	Bunsen's Burners, best make, with 2 Tubes	...	...	£0 5 6
603	1007	" " " 3 "	...	...	0 6 6
604	1008	" " " 4 "	...	...	0 7 6
605	1009	" " " 5 "	...	...	0 9 6
606	1010	" " " 6 "	...	...	0 12 6
607	1011	" Steatite top, on iron foot	...	...	0 3 6
607A	1012	" Steatite rose top on iron foot	...	...	0 5 0

Fletcher's Gas Burners (*See Fletcher's Special List*).

609	1013	Oil Argand Lamp, Japanned Tin...	...	...	0 7 6
1092	1014	Davy's Wire Gauze Safety Lamp	...	...	8/6 & 0 12 6



1015



1017



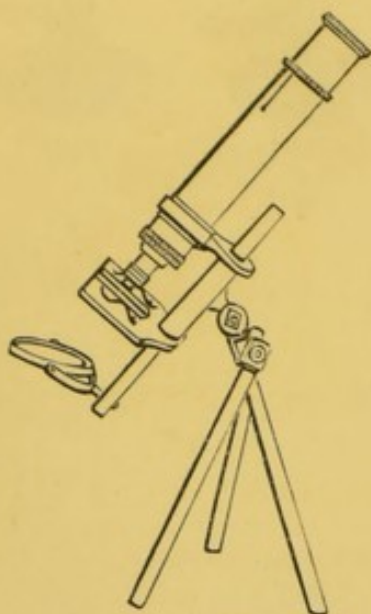
1018

611 1015 Lamp Screen, Stoneware, to steady flame of Spirit Lamp or Gas Burner.

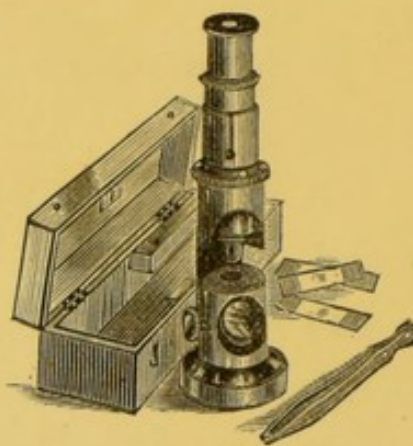
		Height 8 inches, Diameter 4 inches	...	...	0 0 10
		" 9 " " 5 "	...	...	0 1 2
612	1016	" " Porcelain	...	...	0 2 6
613	1017	" " Sheet Iron, on Legs, with Supports for Sand Baths, &c.	...	...	0 2 6

Old
Cat.No.

613A	1018	Zinc Screen, for use with Tripod to steady flame of Gas Burners, Spirit Lamps, &c., 12-in. high	£0	1	3
614	1019	McLeod's Gas Analysis Apparatus, complete	...	26	5 0



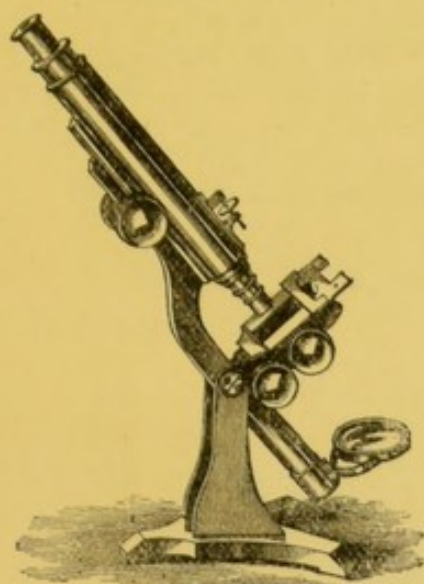
1020



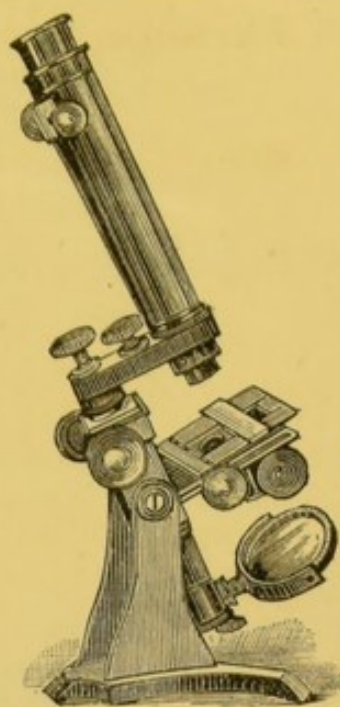
1022

MICROSCOPES.

615	1020	Microscope, cheap portable, student's, in a neat mahogany box, 7 in. by 3½ in., with live box and forceps; when opened out the tripod forming a support of great steadiness to the body. Stage and mirror, which may be inclined at any angle, fitted with eye-piece and three powers	...	£2	2	0
	1021	„ cheap portable, fitted with eye piece and three powers, live box with rackwork adjustment	...	2	15	0
616A	1022	„ tubular pattern, plain sliding motion to body high magnifying power, object glass, hand forceps, one object and two extra hand glasses, in polished case, fitted	... ..	0	7	6
616B	1023	„ with pillar and arm, rack motion to body, concave mirrors, object glass, high magnifying power, hand forceps, and two objects, in polished case, fitted	... ..	1	15	0



1024



1030

Old
Cat.No.

616C	1024	Microscope, Student's Monocular, recommended as a cheap and useful instrument, mounted on brass stand, sliding stage, concave mirror, one eye-piece, three objectives, 1 in., $\frac{1}{2}$ in. and $\frac{1}{4}$ in. condenser and stand, live cage and forceps in polished mahogany case, fitted ...	£4	4	0
616D	1025	Student's Monocular, ditto, ditto, with fine adjustment in polished mahogany case, fitted	5	5	0
616E	1026	Monocular, sliding stage with fine adjustment, stand condenser, live cage and forceps, with either 1 in. or $\frac{1}{4}$ in. power, in polished mahogany case	4	10	0
616F	1027	Monocular, coarse and fine adjustment, circular glass stage and 1 in. objective, &c., in polished mahogany case	6	10	0
616G	1028	Monocular, Portable, with 1 in. objective, &c. in polished mahogany case	5	0	0
616H	1029	Monocular, mechanical stage, with 1 in. and $\frac{1}{4}$ in. objective, &c., in mahogany case ...	8	15	0
616J	1030	Binocular, mechanical lifter body, 1 in. and $\frac{1}{4}$ in. objectives, two eye-pieces, stand and condenser, live cage, frog plate stage, and forceps, in mahogany case	15	10	0
616K	1031	Binocular, with lifter body and rotary plate, mechanical stage, fine adjustment, double mirror on crank arm, four eye-pieces, 1 in. and $\frac{1}{4}$ in. objectives, spot lens, stand condenser, live cage, stage, and hand forceps, in mahogany case	20	0	0

Old
Cat.No.

616L 1032 **Microscope, Binocular**, ditto, ditto, with racked body, mechanical stage, rotary and sliding top plate, fine adjustment, double mirror on crank arm, four eye-pieces, 1 in. and $\frac{1}{4}$ in. objectives, spot lens, stand condenser, live cage, stage, and hand forceps, in mahogany case £25 0 0

616M 1033 **English Objectives**, in Boxes.

$\frac{1}{4}$ in.	...	...	each	£2 10/, £3 15/ and	5 10 0
$\frac{1}{2}$ in.	..	...	„	£1 5/, £3 0/ ..	5 0 0
1 in.	...	...	„	£1 5/, £3 0/ ..	5 0 0

616N 1034 **Dividable Objectives**, in Boxes.

1 in. and 2 in.— $1\frac{1}{2}$ in. and 3 in.—2 in. and 4 in.	...	1 5 0
---	-----	-------

616O 1035 **Eye Pieces** each 0 12 6

616P 1036 **Spot Lenses** from 0 10 6

616Q 1037 **Stand Condensers** each 10/6 and 0 16 6

Microscopes of higher power to order.

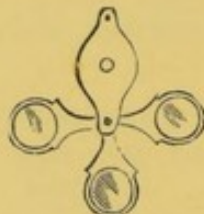
1038 **Thin Glass Squares or Circles** for mounting microscopic objects, per oz. 4/ and 0 4 6

1039 **Microscopic Slides** per doz. 0 0 8

1040 „ „ with Cavities „ 0 1 9



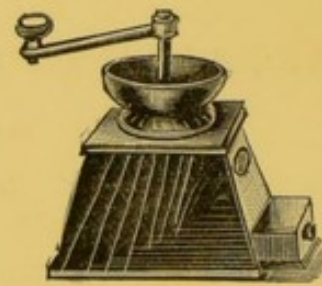
1041



1042

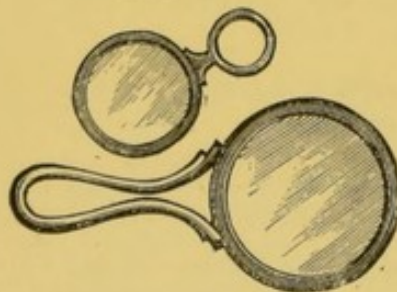


1044



1047

1043



1045



1046

617 1041 **Magnifying Lens**, in Horn Case £0 1 0

618 1042 „ „ Double and Triple, for examining Crystals, &c., or in Blowpipe Operations, mounted in Horn, each 2/6 and 0 3 6

618c 1043 „ „ Mounted in Ebonite 0 1 6

Old Cat.No.	618A	1044	Magnifying Lens, Watchmakers'	£0	1	0
	618D	1044A	„ „ Larger size, and more powerful Lens, mounted in Ebonite	0	1	9
	618E	1045	Reading Lens, 2½ in. diameter, mounted on Ebonite ...	0	4	0
	618F	1046	Reading Lenses, mounted in polished White Metal and black wood handle.			
			2¼ 2¾ 3½ 3¾ 4½ 4¾ inches diam.			
			2/6 3/6 5/ 6/6 8/ 11/ each			
	618B	1047	Mill, small steel, with drawer, for grinding samples to be tested	0	4	6

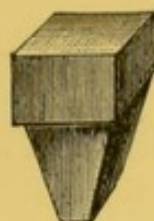
Larger Sizes made to order.



1048



1050



1051



1053

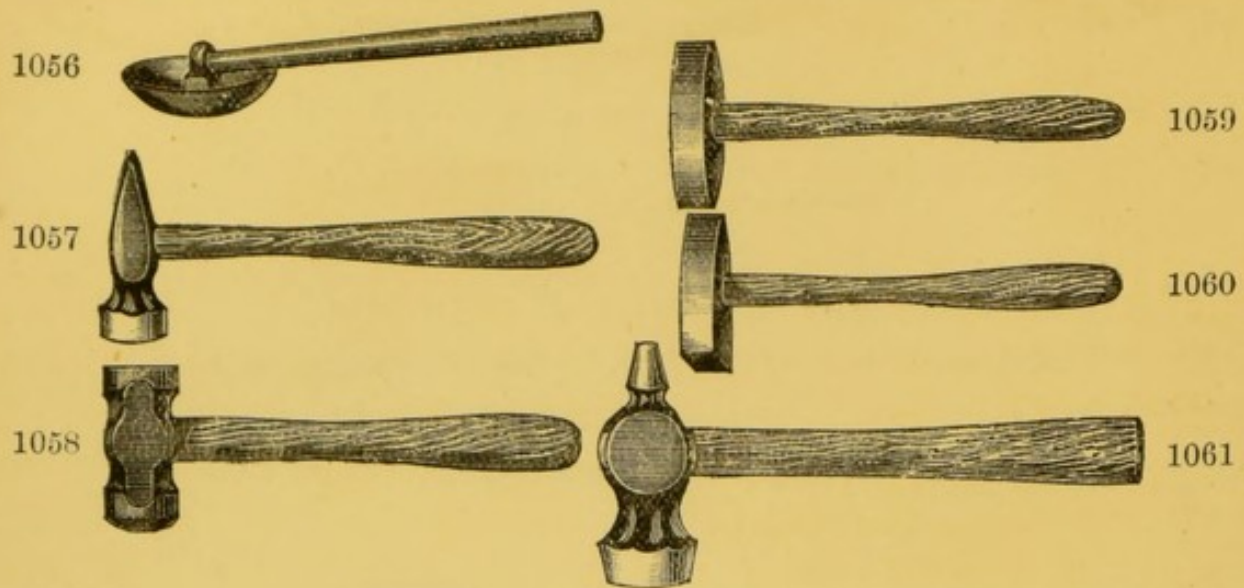
METALLURGICAL APPARATUS AND TOOLS
used in Assaying, &c.

619	1048	Anvil, Hardened Steel, for blowpipe experiments, 1½ × 1½ × ½	£0	1	0
	1049	Anvil or Stake, Assayers, for flattening large beads of gold or silver, surface 3½ × 3½, block 3 in. thick, fang 3 in. by 2 in. ...	1	2	6
620	1050	„ length end to end 5 inches	0	3	6
621	1051	„ or Stake for flattening beads of gold or silver, 4 in. × 4 in. × 1 in.	0	7	6
622	1052	Vice, Watchmakers, to hold small articles in the hand ...	0	5	6
623	1053	„ to screw to table	0	5	6
624	1054	„ stronger, ditto 8/6 and	0	10	6



1055

625	1055	Chisels, for cutting metals	0	1	6
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HAMMERS, ASSAY, &c., with Ash Wood Handles.

Old Cat.No.	1056	Hammer, Bucking, diameter about 8 in., weight about 14 lbs. each	£0 10 6
	1057	Geological, steel ends, pointed head— 3 × 1 in. 4 × 1½ in. 6 × 1½ in. 2/3 2/6 4/6 each	
	1058	Flattening, for buttons, heads rounded— 3 × 1½ in. 4¼ × 1¾ in. 2/6 3/ each	
	1059	Chisel ends— 3 in. 4 in. 2/3 2/6 each	
	1060	Geological, square face, chisel end, 8 × 1¾ in., weight about 5½ lbs. each	0 6 6
	1061	Geological, square face, chisel end— 3 × ¾ in. 4 × 1 in. 2/3 2/6 each	
	1062	Rivetting, end taper or rounded, 5 × 1½ in., each	0 2 6
	1063	Vanning or Miner's Shovels	0 4 6
628	1064	Mallet, white wood	0 2 0
629	1065	box wood	0 3 0



1066

1067

1068



1069



1070

Old
Cat.No.

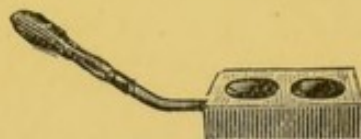
630	1066	Pliers, Black Steel	...	...	...	...	1/ and	£0	1	6
631	1067	„ Cutler's Steel for cutting metals, wire, &c.	2/	„	...	...	2/ „	0	2	6
632	1068	Shears, for cutting metals	...	...	8 in.	2/, 10 in.	...	0	3	0
633	1069	Copper Assay Scoops, in wood handle—								
		Length of metal	5	6	8	10	12 ins.			
			3/6	4/	4/6	5/	6/ each			
633A	1070	Horn Scoops...	...	...	...	...	each	0	0	6
	1071	Scratch Brushes	...	...	...	...	„	0	1	0



1072



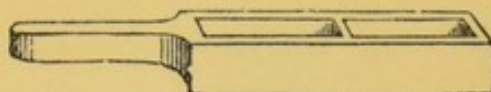
1074



1076



1079



1080

634	1072	Ingot Mould, conical form, with foot	...	...	...	£0	3	0
635	1073	„ turned inside	...	...	...	0	5	6
636	1074	„ double	...	...	...	0	4	0
637	1075	„ „ turned inside	...	...	...	0	7	6
638	1076	„ turned and polished steel, 2 holes, with handle	...	...	...	0	6	6
639	1077	„ „ „ 4 „ „	...	...	...	0	15	0
640	1078	„ Cast Iron, for small bars, $4\frac{1}{4} \times 1\frac{1}{2} \times \frac{1}{2}$	...	...	...	0	0	10
641	1079	„ „ for bars, $6 \times 1\frac{7}{8} \times 2$	...	...	...	0	2	0
		„ „ $7\frac{3}{4} \times 1\frac{7}{8} \times 2$	...	...	...	0	2	9
		„ „ $9\frac{3}{8} \times 2\frac{5}{8} \times 2$	...	...	...	0	5	0
642	1080	„ „ with divisions, each division $4 \times 2\frac{3}{8} \times 2\frac{1}{2}$	...	...	...	0	5	0



1081



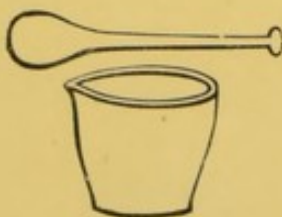
1082



1084

Old
Cat.No.

643	1081	Mortars, Hardest Polished Steel, for crushing minerals,	diameter of Pestle $\frac{3}{8}$ in.	£0 6 6
644	1082	„ „ in 3 pieces	„ „ $\frac{5}{8}$ „	0 16 0
645	1083	„ „ „	„ „ $1\frac{1}{8}$ „	1 6 0
646	1084	„ „ Mounted in Gun Metal, on broad base	$\frac{5}{8}$ „	0 16 0
647	1085	„ „ „	„ „ $1\frac{1}{8}$ „	1 6 0
648	1086	„ Copper or Gun Metal, polished, diam. at top	$2\frac{3}{8}$ „	0 7 6



1087



1088



1089

649	1087	Mortars and Pestles, Iron, Bowl Shaped, turned inside—											
		Outside diam.	4	$4\frac{1}{2}$	5	$6\frac{1}{4}$	$7\frac{1}{4}$	$7\frac{3}{4}$	$8\frac{1}{2}$ in.				
			$\frac{2}{3}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{5}{6}$	$\frac{5}{6}$	$\frac{7}{6}$	$\frac{8}{6}$ each				
650	1088	Mortars and Pestles, Iron, Bell Shaped, turned inside—											
		Outside diam.	4	$4\frac{1}{2}$	$5\frac{1}{2}$	$6\frac{1}{2}$	8	10	12	15 in.			
			$\frac{1}{6}$	$\frac{2}{3}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{7}{6}$	$\frac{12}{6}$	$\frac{18}{6}$	$\frac{40}{6}$ each			
651	1089	Mortars and Pestles, Wedgwood Ware, Pestle with wood handle—											
		Outside diam.	$2\frac{1}{2}$	3	4	5	$5\frac{1}{2}$	$6\frac{1}{2}$	7	8	9	10	12 in.
			$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{2}{3}$	$\frac{2}{6}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{5}{6}$	$\frac{7}{6}$	$\frac{9}{6}$	$\frac{16}{6}$ each
652	1090	Mortars and Pestles, Stout Composition Stoneware—											
		Outside diam.	$2\frac{1}{2}$	3	4	5	$5\frac{1}{2}$	$6\frac{1}{2}$	7	8	9	10	12 in.
			$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{6}$	$\frac{2}{6}$	$\frac{2}{3}$	$\frac{2}{9}$	$\frac{3}{6}$	$\frac{4}{6}$	$\frac{6}{6}$	$\frac{7}{6}$	$\frac{12}{6}$ each



1091



1092



1093



1095

Old
Cat.No.

653 1091 **Mortars and Pestles**, Berlin Porcelain, Glazed outside, Biscuit Porcelain inside—

Outside diam.	2	2 $\frac{3}{4}$	3 $\frac{1}{2}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{3}{4}$ in.
9d.	1/9	2/9	3/6	4/9	5/9	each

654 1092 **Mortars and Pestles**, Dresden Biscuit Porcelain, shallow, for organic analysis—

Diam.	2 $\frac{1}{2}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	5	6	7 $\frac{1}{4}$	9 in.
	1/9	2/3	2/9	3/6	4/6	6/	8/6 each

655 1093 **Mortars and Pestles**, German Porcelain, Glazed outside—

Diam.	2 $\frac{3}{4}$	3	3 $\frac{3}{4}$	4 $\frac{1}{2}$	5	6 in.
10d.	1/	1/3	2/	2/9	4/	each

656 1094 **Mortars and Pestles**, Composition, shallow, strong, as Fig. 1092—

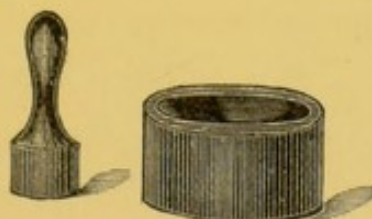
Diameter	3 $\frac{1}{2}$	4 $\frac{1}{4}$ in.
10d.	1/	each

657 1095 **Mortars and Pestles**, stout Bohemian Glass—

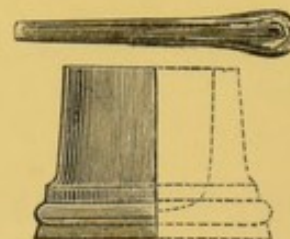
Diam.	2 $\frac{1}{2}$	3 $\frac{1}{4}$	4 $\frac{1}{4}$	5 $\frac{1}{4}$	6 $\frac{1}{2}$	7 $\frac{1}{2}$ in.
8d.	10d.	1/	1/4	1/9	2/6	each



1096



1097



1098

658 1096 **Mortars and Pestle**, Agate, highly polished, for analytical use and pulverization of hard substances—

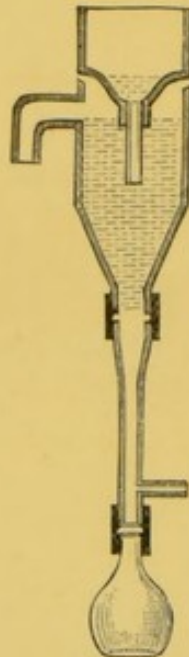
1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2	2 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	3 in. diam.
3/3	3/9	4/6	6/	7/	8/	11/	15/6 each
3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	4	4 $\frac{1}{2}$	5	5 $\frac{1}{4}$	5 $\frac{1}{2}$ in. diam.
20/	24/	27/	32/	40/	60/	70/	80/ each

658A 1097 **Mortar and Pestle**, strong cast iron, Barry's Patent, heavy pestle, with flat surface, 2 $\frac{3}{8}$ in. diameter, specially adapted for crushing and reducing to powder mineral substances, &c.; diameter of Mortar 4 $\frac{3}{4}$ in., height 2 $\frac{3}{4}$ in. £0 5 0

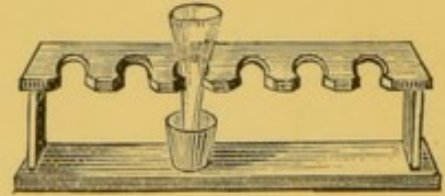
1098 **Mortars and Pestles**, cast steel, for assayers, &c.—
 Height 6 in., diam. 6 in., weight about 30 lbs., each 0 15 0
 „ 8 „ „ 7 „ „ „ 40 „ „ 1 0 0



1099



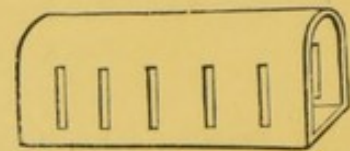
1100



1101



1102



1103

Old
Cat.No.

658B 1099 Mortar Amalgamator, solid cast iron, 9 in. diam.,
turned inside £4 0 0

658c 1100 Assay, Spitz Lutte, for Washing and Concentration
Test, 5 in. diam., strong zinc, complete ... 1 0 0

658D 1101 Turning out Rack, teak, for gold assay, for 6 flasks ... 0 3 6

658E 1102 Taster, useful for taking samples from heaps, iron rod $\frac{1}{2}$ in.
diam., length end to end 3 ft., welded on to
strong sheet iron cylinder 8 in. by $1\frac{1}{4}$ in. diam.,
end sharpened 0 3 6

659 1103 Muffles, Fire Clay, for Cupelling—

Length	7	$7\frac{1}{2}$	8	$8\frac{1}{2}$	9	10	11	$10\frac{1}{2}$	12 inches
Width	$3\frac{1}{2}$	$4\frac{3}{8}$	$4\frac{3}{4}$	5	$5\frac{1}{2}$	6	4	$5\frac{1}{4}$	6 ,,
Height	$2\frac{1}{2}$	$2\frac{7}{8}$	3	$3\frac{1}{4}$	$3\frac{5}{8}$	4	$3\frac{3}{8}$	$3\frac{7}{8}$	4 ,,
	$1/9$	2/	$2/3$	$2/9$	$3/3$	$3/9$	$2/9$	$3/6$	4/6 each

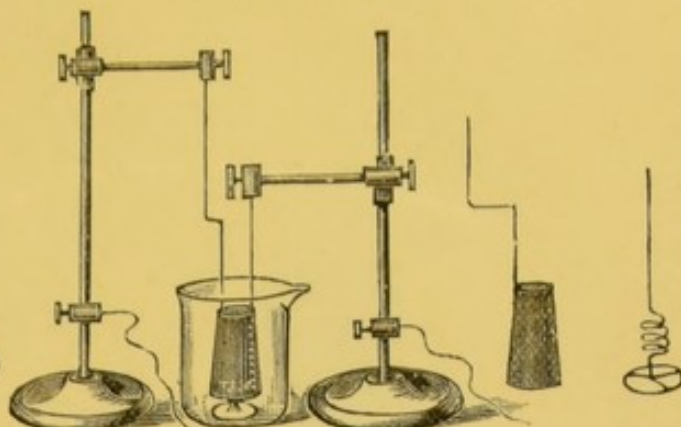
Salamander and other sizes made to order.



1104



1105



1106

Old
Cat.No.

1667 1104 Buckets, Iron, enamelled inside for mercury, japanned black or red outside—

Diameter at top	6	8	10 in.
	3/6	4/6	6/6 each

1668 1105 Sheet Iron Gold Washing Basins—

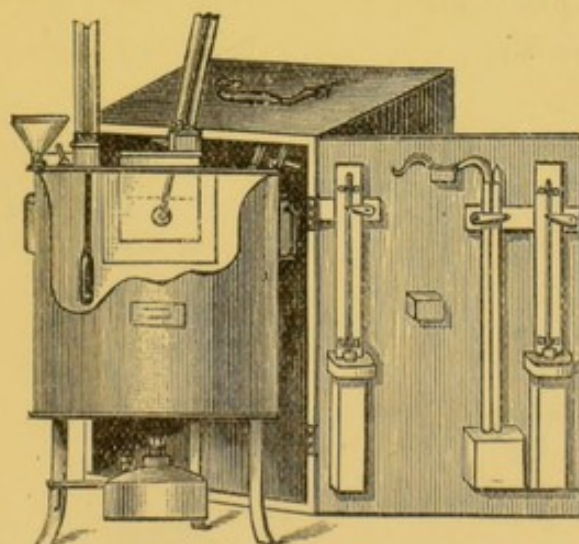
16 in. diameter, 2 $\frac{3}{4}$ in. deep	each	£0	3	0
---	-----	-----	-----	------	----	---	---

1669 1106 Apparatus for Electrolytic estimation of Copper, as arranged by Dr. A. Classen, Platinum Cone 2 $\frac{1}{2}$ × 1 $\frac{1}{2}$ in., with wire attached and Platinum spiral; depending upon size and weight of Platinum, the set, about

4 0 0

Brass Stand with support and screws

0 4 6



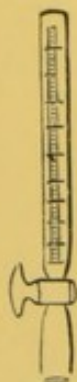
1107

660A 1107 Board of Trade Official Petroleum Test Apparatus, Petroleum Act, 1879, complete in polished mahogany case with fittings

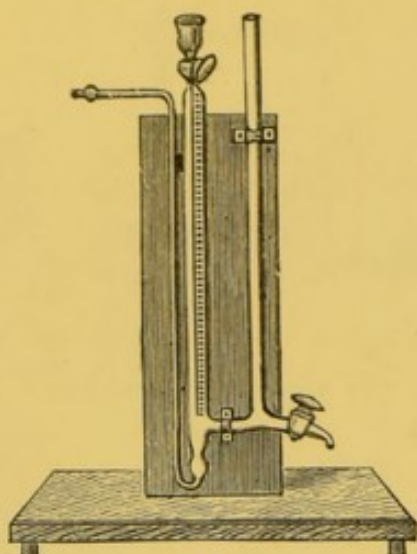
£5 5 0

Board of Trade Fee for Stamping, *extra*

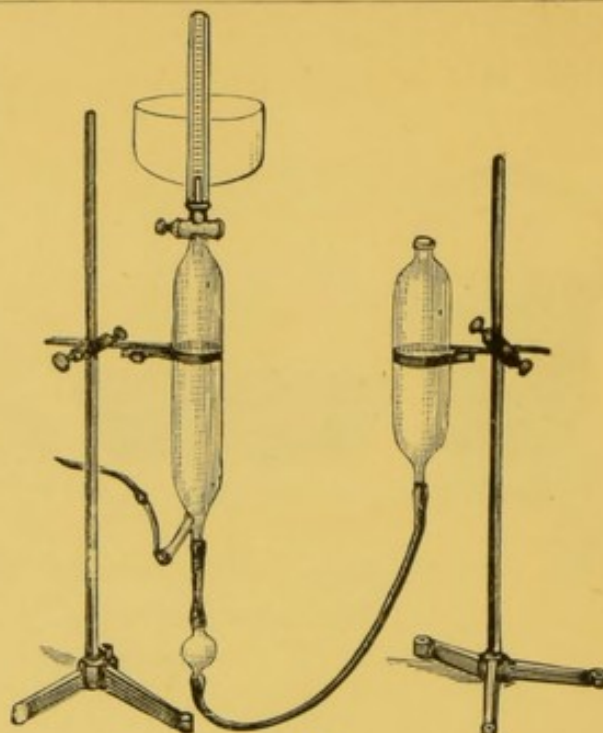
0 5 0



1108
Old
Cat.No.



1111



1113

660	1108	Nitrogen Tubes, with Stopcock, Crum's ...	...	...	£0	3	0
661	1109	„ Graduated, 80 c.c. in 1-5th	...	...	0	4	6
	1110	„ „ 50 c.c. in 1-5th	...	...	0	5	6
661A	1111	Schwarz's Apparatus, for determination of Nitrogen, graduated 80 c.c. in single divisions	...	...	0	12	0
	1112	Stand for ditto ...	...	...	0	4	0
661B	1113	Staedel's Apparatus for collection of Nitrogen, glass parts only ...	...	...	0	14	0
	1114	Stand with clamp ...	...	...	0	7	6



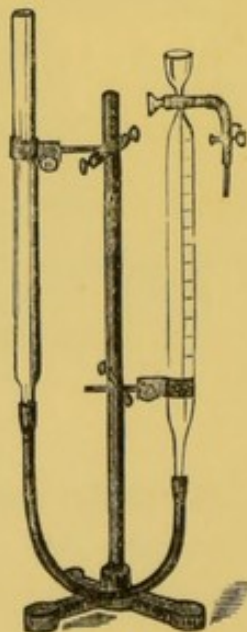
1115



1116



1117



1118



1120 A & B



Old
Cat.No.

1670	1115	Nitrometer, Allen's, graduated 50 c.c. in 1-5th	...	...	...	£0	8	0
1671	1116	„ Tennant's—	30	50	100 c.c. in. 1-5th			
			7/	8/	10/			
661c	1117	„ Brady's, 30 c.c. in 1-5th	...	...	...	0	8	6
661d	1118	„ Lunge's, 50 c.c. in 1-5th, with Plain Tube	...	...	...	0	8	0
	1119	Iron Stand, with clamps on Tripod foot	...	...	...	0	10	6
	1120	Nitrometer, Lunge's, with Greiner & Friedrich's Patent Stopcock, 50 c.c. in 1-5th, either pattern A or B				0	10	6



1121



1122



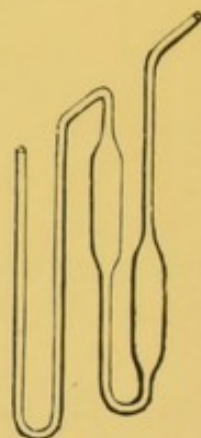
1123



1124



1125



1126

662 1121 Pipettes or Dropping Tubes, Bulb—

2d.	3d.	4d.	6d. each
1/6	2/	3/	4/ per doz.

663 1122 Pipettes or Dropping Tubes, Cylindrical, ea., 3d., 4d., 6d. & £0 0 9

1672 1123 Dropping Bottle, Rauvier's—

15	30	50 c.c.
9d.	10d.	1/ each

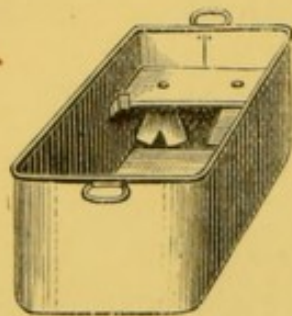
„ „ new form, with hollow Stopper, capacity 50 cc. 0 1 3

„ „ „ solid „ „ „ 0 1 2

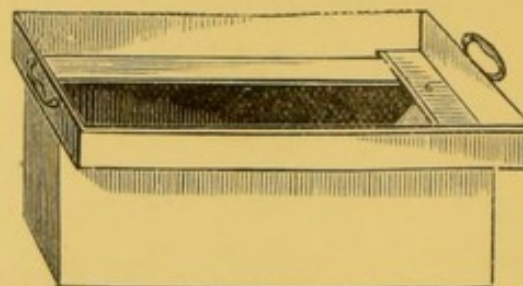
664 1124 Pipette or Dropping Bottle, with Vulcanized Rubber Top, ea. 0 1 0

665 1125 „ „ „ Schuster's Stoppered „ 0 0 6

666 1126 Pipette Gas, Ettling's each 1/6 and 0 2 0



1127



1128

PNEUMATIC TROUGHS.

Old
Cat.No.

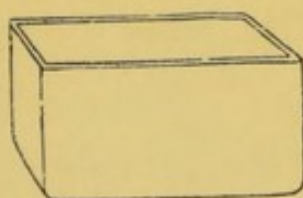
667 1127 Pneumatic Trough, Japanned Tin, with moveable Shelf.

Capacity.	Length.	Width.	Height.			
1 gallon	10 inches	6 $\frac{1}{4}$ inches	6 inches	...	£0	2 6
2 „	11 $\frac{1}{2}$ „	8 $\frac{3}{4}$ „	6 $\frac{1}{2}$ „	...	0	3 6
4 „	13 „	9 $\frac{3}{4}$ „	9 $\frac{3}{4}$ „	...	0	5 0
6 „	15 $\frac{1}{2}$ „	12 „	12 „	...	0	8 0

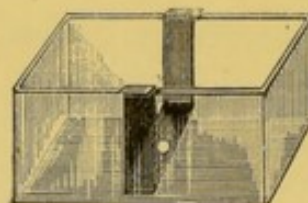
668 1128 Pneumatic Trough, Japanned Tin, with Side Shelves and Slide, 14 × 8 × 6 0 4 6

669 1129 Pneumatic Troughs, Japanned Tin, with Side Shelves and moveable Shelf, white Japanned inside—as Fig. 1128.

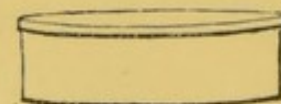
Length.	Width.	Height.			
17 inches	12 inches	7 $\frac{1}{2}$ inches	...	0	8 6
21 „	12 „	7 $\frac{1}{2}$ „	...	0	10 6
24 „	14 „	8 $\frac{1}{2}$ „	...	0	12 6



1130



1131



1132

670 1130 Pneumatic Troughs, stout Bohemian Glass, Rectangular.

Length.	Width.	Height.			
8 $\frac{1}{2}$ inches	4 inches	4 $\frac{1}{4}$ inches	...	£0	6 6
10 „	5 „	5 „	...	0	9 0
13 „	7 „	6 $\frac{1}{4}$ „	...	0	14 0
15 „	7 $\frac{1}{2}$ „	6 $\frac{1}{2}$ „	...	0	18 0

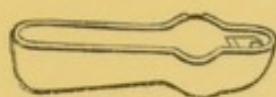
Old
Cat.No.

670A 1131 Pneumatic Troughs, Edges and Sides Cut and Polished—

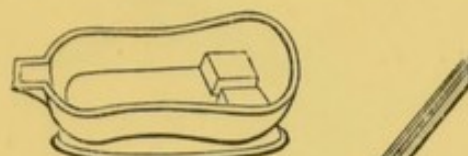
Length	Width	Height	
8½ inches	4 inches	4½ inches	£0 13 0
10 "	5 "	5 "	0 18 0
13 "	7 "	6¼ "	1 7 0
15 "	7½ "	6½ "	1 14 0
Brass Sliding Shelf to fit	...	...	0 3 6

671 1132 Pneumatic Troughs, Brown Stoneware, round.

Diameter.	Height.	
9 inches.	3 inches.	0 1 6
12 "	5½ "	0 2 6
16 "	6 "	0 4 6



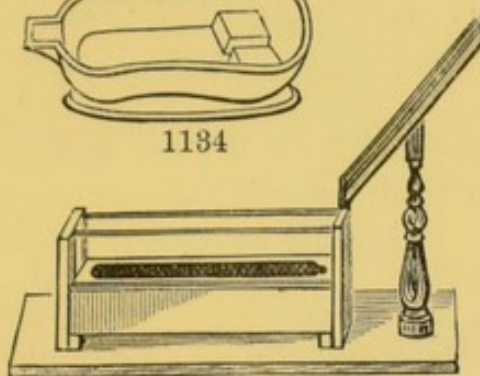
1133



1134



1138



1136



1137

672	1133	Pneumatic Troughs for Mercury, Berlin Porcelain, to contain 4 lbs. mercury	£0 2 0
673	1134	" " " " 10 lbs.	0 7 0
674	1135	" " " Wedgwood Ware, 10 lbs.	0 3 0

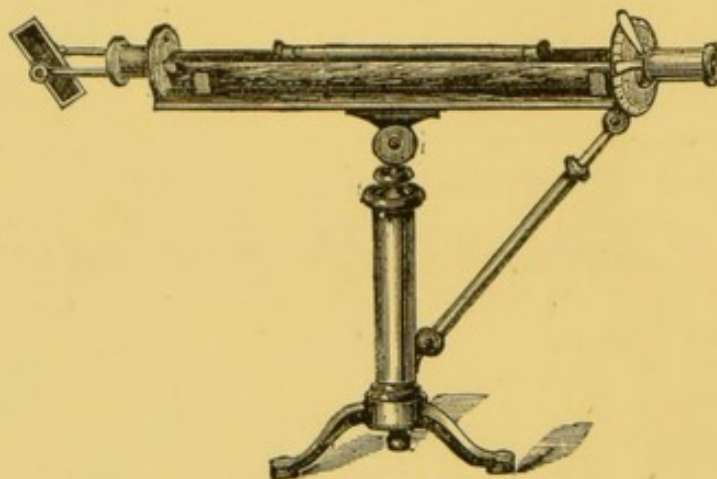
675	1136	Bunsen's Pneumatic Trough for use with Mercury, consisting of Solid Mahogany Trough with Plate-glass Sides, and Frame for supporting Eudiometer; internal measure, 14 in. × 3 in.; requires about 20 lbs. mercury to cover the shelf, and 45 lbs. to fill it entirely	1 10 0
	Do.	do. Black Wood	1 7 6

676 1137 Pneumatic Troughs, Glass, Vertical, for Tube Operations.

Height.	Diameter.	Width at Mouth.	
8 inches	2 inches	3 inches	0 1 0
12 "	2 "	3 "	0 1 3
12 "	2½ "	3 "	0 1 6
16 "	2½ "	3½ "	0 1 9

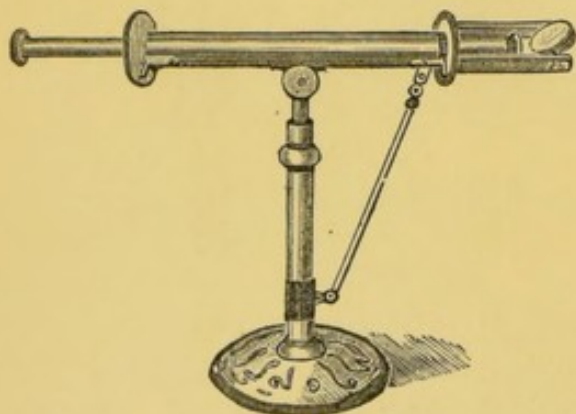
Old
Cat.No.

677	1188	Pneumatic Trough Shelves, Earthenware (Beehive Shelves), Diameter 3 inches, each	£0 0 6
		4½ " "	0 0 9
		5½ " "	0 1 0

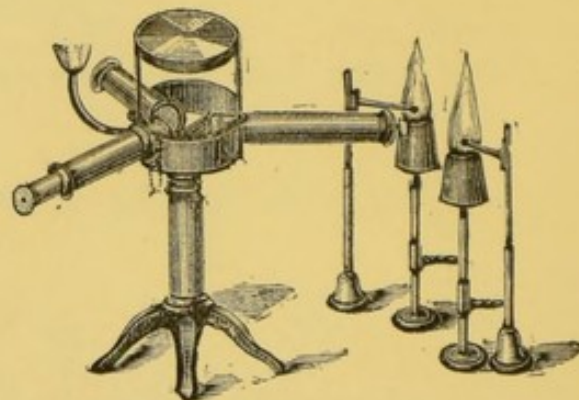


1139

677A	1139	Polariscope, adapted for Sugar, Chemical Analysis, and general purposes	£5 0 0
	1140	„ in Polished Mahogany Case	6 0 0



1141



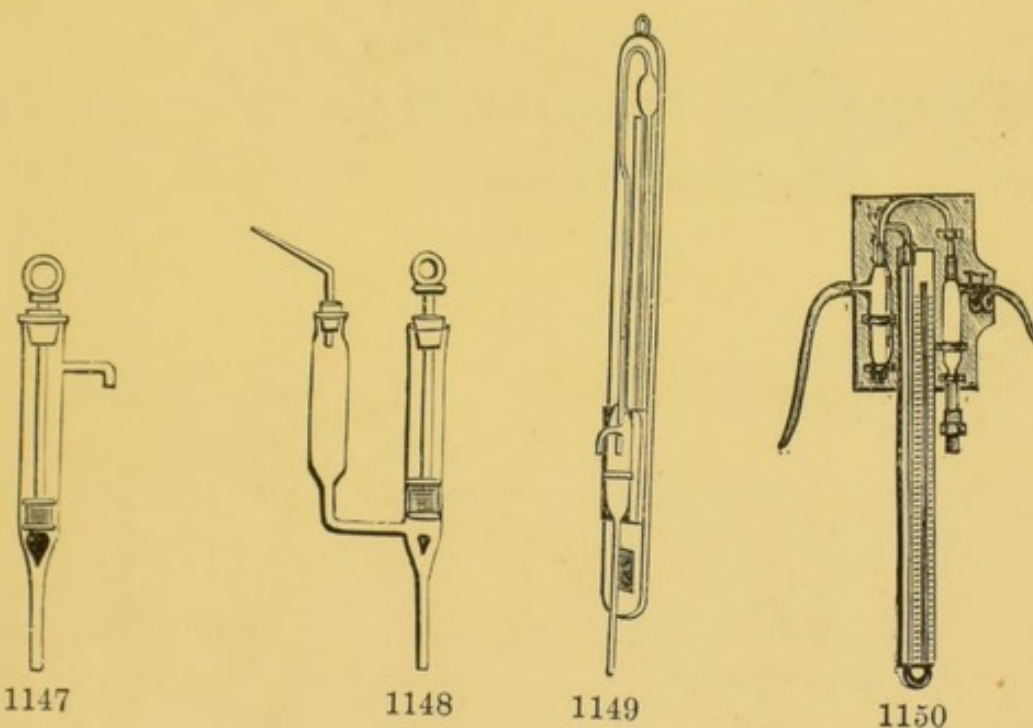
1142

677B	1141	Polariscope, Mitscherlich's, for Sugar Analysis	£3 10 0
677c	1142	„ Kirchoff and Bunsen's, arranged for the examination of two coloured Spectra of Chemicals at one time, with two gas burners, 2 supports for objects, and 12 platinum wires mounted in glass handle, with 2 tubes and 5 millimetre scales Complete	6 10 0
		Polished Mahogany Case, extra	1 5 0

Old
Cat.No.

677 ^D	1143	Duboscq Soleil Saccharometer	£12 10 0
	1144	Laurent's Polariscopes and Saccharometer, with two divisions	14 0 0
	1145	Gas Burner, with two Jets	2 10 0
	1146	Three-metal Tubes, 20 centimetres	1 15 0

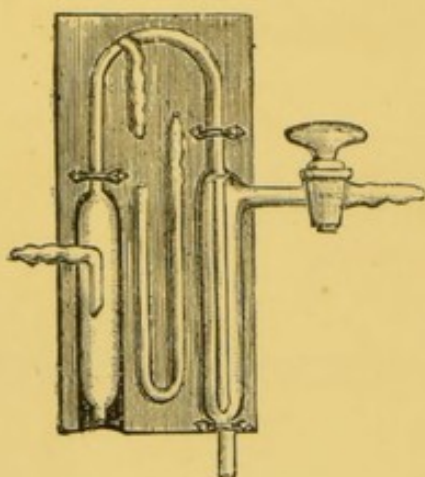
Precipitating Glasses (*see Beakers, Phillips', and Test Glasses*).



678	1147	Pumps, Model, Glass Lift Pump	£0 3 0
679	1148	„ „ „ Force Pump	0 3 6

See also Pneumatic Apparatus.

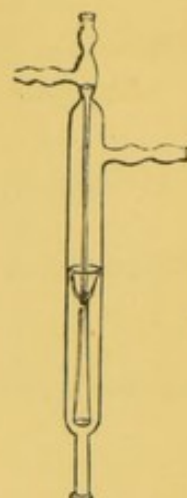
680	1149	„ Bunsen's, on Mahogany Frame, for quick filtering	0 10 6
681	1150	„ „ on Frame, fitted with gauge and strong clamps	1 10 0
	1151	Platinum Cones, perforated ... each 2/, 3/, and	0 4 0



1152



1153



1154

Old
Cat.No.

681B	1152	Pump, Bunsen's Filter, on Polished Frame	...	...	£0 14 0
681C	1153	,, Filter Pump Tube, water	...	...	0 1 6
681D	1154	,, ,, ,, Improved	...	...	0 4 0



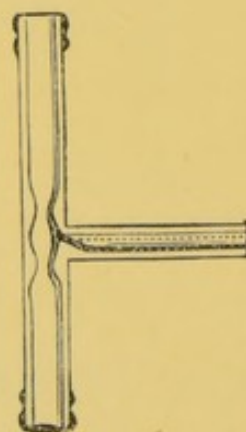
1155



1156

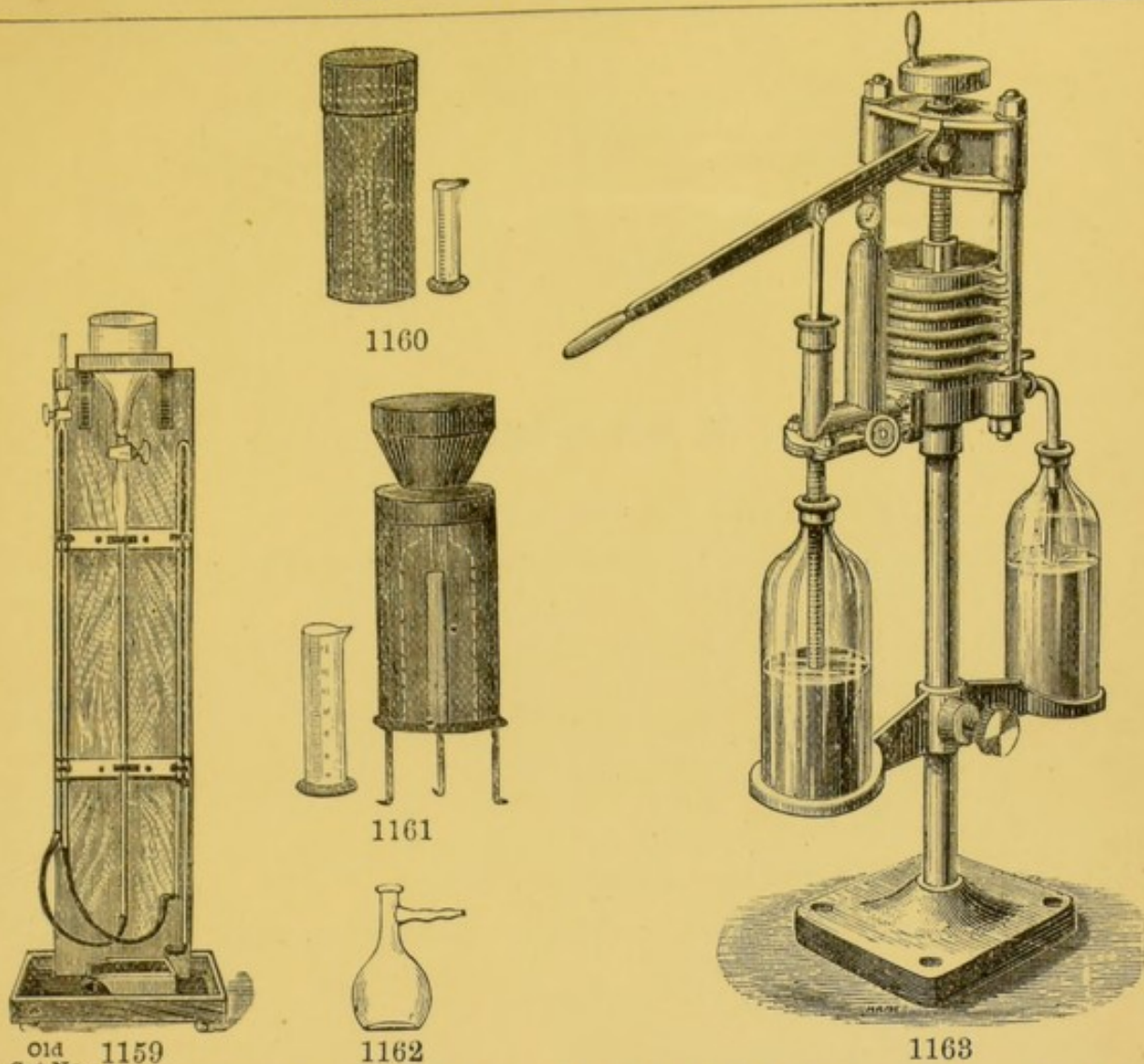


1157



1158

681E	1155	Pump, Filter Tube, Geissler's	...	...	£0 1 6
681F	1156	,, ,, ,, as used at the University College, London	...	...	0 2 6
1664	1157	,, ,, ,, Finkener's	...	...	0 3 0
	1158	,, ,, ,, Tower's	...	...	0 3 0



Old Cat.No.	1159				
682	1159	Sprengel's Pump, mounted on wood frame, complete	£3	3	0
682A	1160	Rain Gauge, Japanned Tin with moveable Top and Funnel, Graduated Measure and Tin outer case for ditto	0	7	6
682D	1161	Rain Gauge, Snowden's, Japanned Tin, with Graduated Measure and Bottle for Receiver	0	10	6
682B	1162	Flask, with Side Tube, 24 oz. capacity, strong, for use with Filter Pumps	0	2	0

PATENT ANIMAL CHARCOAL FILTER PAPERS.

These Filtering Discs will be found of great use in the Pharmaceutical Laboratory, or in the Preparation Room of a Scientific Laboratory.

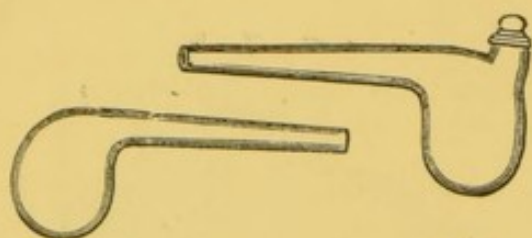
They are composed of paper-pulp of vegetable fibre only, mixed with about 20 per cent. of animal charcoal, purified by the removal of the 90 per cent. of phosphates, &c., which ordinary animal charcoal has, by washing with hydrochloric acid, so that the disc may be considered equal to, at least, 2½ to 3 times its own weight of ordinary animal charcoal, with the advantage of being free from phosphates.

S. H. JOHNSON & Co.'s LABORATORY FILTER PRESS.

Prices complete with Gun Metal Pump and Accumulator and Pressure Gauge, as shown in illustration, working pressure to 120 lbs. per square inch, can be worked with either filtering paper or filter cloth.

			In Iron.		In Hard Bronze
682c	1163	4 Chambers for 8 Filter Papers	£7 10 0	...	£12 0 0
		6 " 12 " "	10 10 0	...	15 0 0
		12 " 24 " "	15 10 0	...	20 0 0

Patent Carbon Filtering Discs for above, 3/9 per hundred.



1164

1165



1168

RETORTS.

Old
Cat.No.

683, 684 1164, 1165 Retorts, Fire Clay (Fig. 1164)—

Capacity, $\frac{1}{2}$ pint Plain, 1/; Tubulated and Stoppered (Fig. 1165)	£0	1	3
1 " " 1/6 " " "	0	2	0
1 $\frac{1}{2}$ " " 2/6 " " "	0	3	0
2 " " 3/ " " "	0	3	6
3 " " 3/9 " " "	0	4	3
4 " " 4/6 " " "	0	5	0
8 " " 6/ " " "	0	6	6

683A 1166 Retorts, Berlin Biscuit Porcelain, Plain—

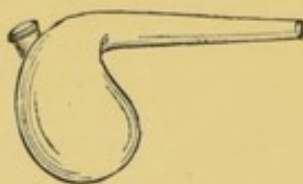
	2	4	6	8 oz. capacity.
Plain ...	4/6	5/6	6/	7/6

684B 1167 ,, Stoppered 5/6 6/6 7/6 8/6

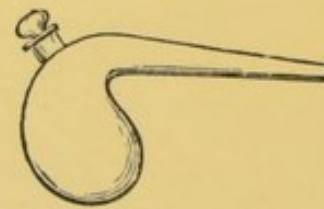
684c 1168 ,, Berlin Porcelain, with moveable head, 8 oz. capacity each 0 6 6



1169



1170



1171

Retorts, best Bohemian hard glass, for distillation—

	2	4	6	8	12	16	20	24 oz. capacity
685 1169 Plain	3d.	4d.	4 $\frac{1}{2}$ d.	5d.	6d.	7d.	7d.	8d. each
	32	40	48	64	80	100	120	160 oz. capacity
,,	9d.	10d.	1/	1/2	1/3	1/6	1/8	2/ each

Old Cat.No.		2	4	6	8	12	16	20	24 oz. capacity
686	1170 Tubulated	4d.	4d.	5d.	6d.	7d.	8d.	8d.	9d. each
		32	40	48	64	80	100	120	160 oz. capacity
	„	10d.	1/	1/2	1/4	1/9	2/	2/3	2/6 each
		2	4	6	8	12	16	20	24 oz. capacity
687	1171 Stoppered	6d.	7d.	8d.	9d.	10d.	1/	1/1	1/2 each
		32	40	48	64	80	100	120	160 oz. capacity
	„	1/3	1/6	1/9	2/	2/6	3/	3/3	3/6 each

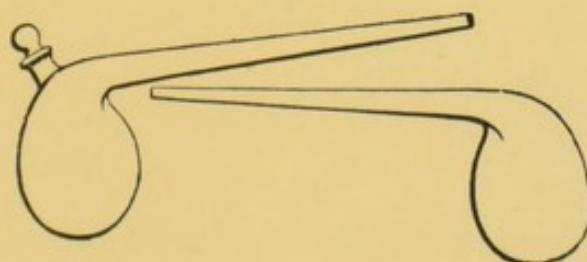
688 1172 Retorts, Bohemian Glass, for Manufacturers' use—

Capacity	8	10	14	18	24	30	36	42	48 lbs.
Tubulated, as Fig. 1170—	2/3	2/6	3/	4/6	5/6	7/	8/6	10/6	12/6 each
Stoppered, as Fig. 1171—	3/3	3/6	4/6	5/	6/6	8/6	10/6	12/6	15/ each

689 1173 Retorts, Best German Glass, Plain, as Fig. 1169—

Capacity	2	3	4	6	8	12	16	24	32	40 oz.
	2/	2/6	2/9	3/	3/6	4/6	5/	7/6	9/	10/ per doz.

Less quantity than 1 doz. charged at a higher rate.

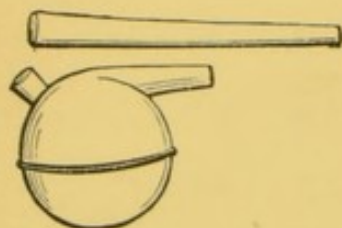


1174

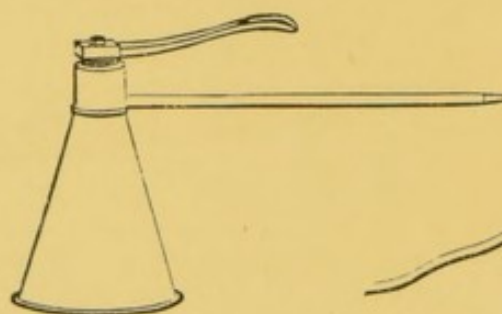
1175

690, 691 1174, 1175 Retorts, White, Thin German Hard Glass—

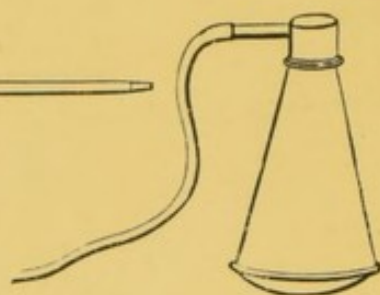
Capacity	...	1	2	3	4	6	8 oz.
Stoppered, Fig. 1174	4/	4/6	5/	6/	7/6	8/6	per doz.
Plain, Fig. 1175	1/6	2/	2/6	2/9	3/	3/6	„



1176



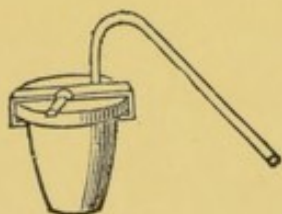
1179



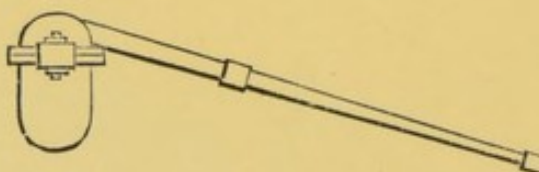
1181

Old
Cat.No.

692	1176	Retorts, Brazed Copper, with Tubulure for destructive distillation—Capacity 20 ounces	£0 10 6
		„ 40 „	0 13 6
693	1177	„ Sheet Iron, Oxygen, with Leading Tube, for Chlorate of Potash and Manganese (Fig. 806)	0 4 6
694	1178	„ Tube Copper for making smaller quantities of Oxygen (Fig. 809)	0 2 6
695	1179	„ Sheet Iron, Oxygen, with Leading Tube and Key (Fig. 1179) for Chlorate, Potash, and Manganese, Capacity about 1½ pint	0 7 6
696	1180	„ „ with Copper Bottom	0 8 6
697	1181	„ Copper, Polished, with Brass Cap and Union ...	0 12 6
698	1182	„ Copper Ball, hammered up thin	0 9 0
699	1183	„ „ „ stout	0 15 0
700	1184	„ Cast Iron, with Leading Tube for Manganese ...	0 8 6



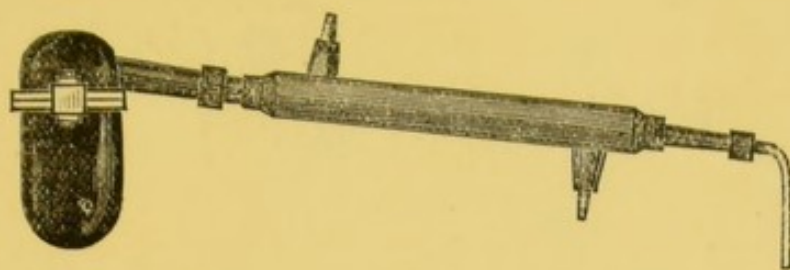
1185



1186

701	1185	Retorts, Cast Iron, or Mercury distillation, Oxygen, &c., with Ground Flange, Clamp, and Leading Tube—Capacity about 1 pint	£0 12 6
		„ 1½ „	0 18 6
702	1186	„ Cast Iron, for Mercury, &c., bored with long Leading Tube to Screw, Loose Head fastened by Bolts—Capacity 1 5 9 pints	

10/ 21/ 32/6



1187

Old
Cat.No.

1187	Retorts, Cast Iron, for Mercury distillation from Gold Amalgam, Bored, with long Leading Tube to Screw, Loose Head fastened by Bolts and Condenser complete—Capacity 5 pints	£1 15 0
„ 9	„ „	2 12 6

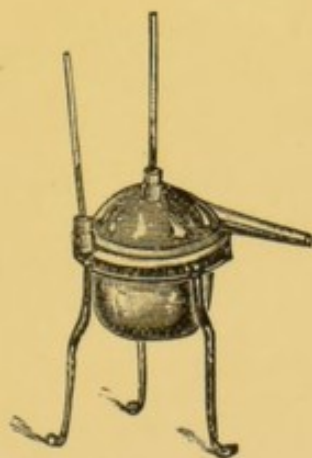


1188

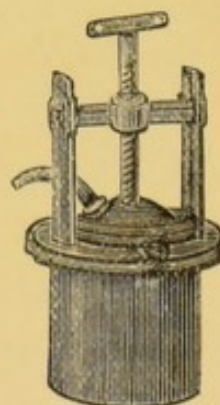


1189

703	1188	Retort and Receiver, Lead, for Hydrofluoric Acid ...	£0 12 6
704	1189	„ Lead, with Tubulure for ditto, capacity 20 ounces ...	0 7 6
705	1190	„ Platinum, per ounce, 38/: 4 ounce capacity, about £5; other sizes proportionately.	



1191

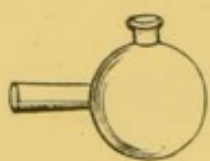


1192

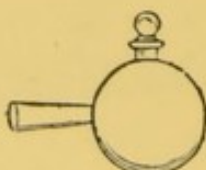
705A	1191	Retort, with Water Bath, Copper, for distillation of Volatile Spirits, Naphtha, &c., on Stand without Thermometer. Capacity about 1 pint... ..	£0 15 0
1630	1192	„ Cast Iron, Mercury for Gold Assay	1 5 0



1193



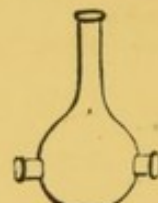
1194



1195



1196



1197

Old
Cat.No.

706 to 708 1193 to 1195 **Receivers**, Bohemian Glass for Retorts—
Plain Fig. 1193 ; Tubulated, Fig. 1194 ; Stoppered, Fig. 1195.
Same Prices as Retorts.

709 1196 **Receivers**, Bohemian Glass, with 2 necks—

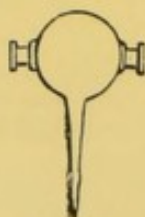
Capacity 8 12 16 20 32 48 ozs.

8d. 9d. 10d. 1/ 1/3 1/6 each

710 1197 **Receivers**, Bohemian Glass, with 3 necks—

Capacity 8 16 20 32 48 64 80 ozs.

1/2 1/4 1/6 1/8 2/ 2/6 2/9 each



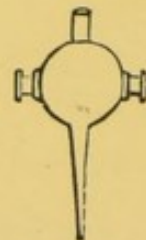
1198



1199



1200



1201

711, 712, 713 1198 1199 1200 **Receivers**, Bohemian Glass, Quill,
with 2 necks, either form same price—

Capacity 8 16 20 32 48 64 80 120 ozs.

1/4 1/8 1/10 2/ 2/6 3/ 3/6 4/6 each

714 1201 **Receivers**, Bohemian Glass with 3 necks and Quill,

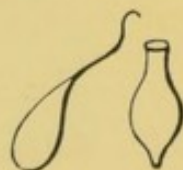
Capacity 16 20 32 48 80 120 160 ozs.

2/6 3/ 3/6 4/ 5/6 6/6 8/ each

Stoppering 6d. each neck extra.



1202



1203



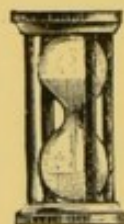
1204



1205



1207



1209

715 1202 **Receivers**, Florentine (Separators)—

Capacity 16 24 40 60 80 ozs.

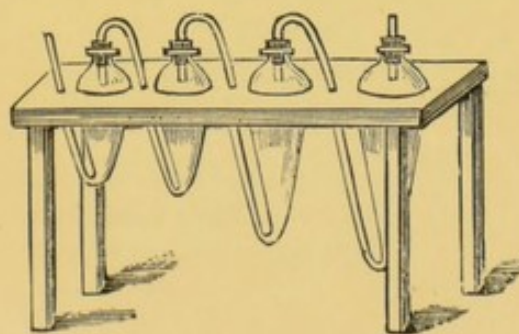
1/6 1/9 2/6 3/ 3/6 each

Old Cat.No.									
716	1203	Rupert's Drops, for showing the brittleness of glass, per doz.							£0 0 9
717	1204	Bologna Vials	...	...	...	...	...	...	0 2 0
718	1205	Sand Bath Dishes, Shallow—							
		Tinned Iron, diameter 4 inches, each							0 0 2
		" " 5 "							0 0 3
		" " 6 "							0 0 4
719	1206	" " Sheet Iron, diameter 8 "							0 0 6
		" " 10 "							0 0 8
		" " 12 "							0 0 10
720	1207	" " Tinned Iron, deep 4½ "							0 0 6
721	1208	" " Copper, diameter 3 "							0 0 4
		" " 4 "							0 0 8
		" " 5 "							0 0 10
		" " 6 "							0 1 4
1673	1209	Sand Time Glasses, in strong wood frames—							
			3	5	15	30	60	minutes	
			1/	1/6	2/	2/6	3/	each	

Scales and Weights, see "Balances and Weights."

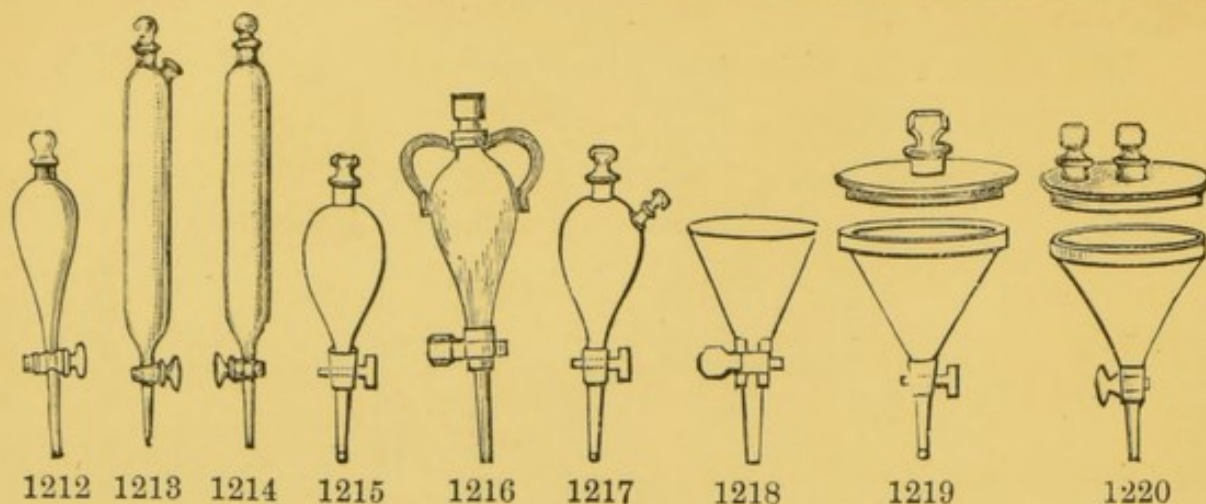


1210



1211

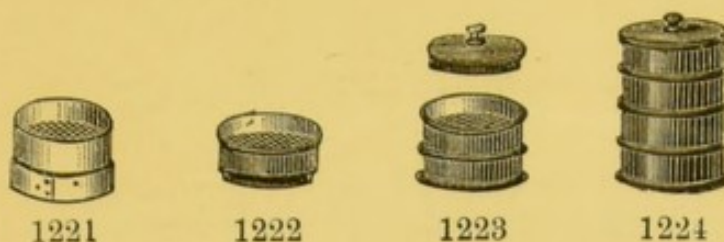
721A	1210	Schulze's Elutriating Apparatus, for Analysis of Soils, &c.	...	...	...	...	...	...	£0 5 0
721B	1211	Washing Apparatus, for Analysis of Soils, set of 4 vessels	...	...	...	...	...	...	0 10 6
		Stand	...	...	...	...	...	extra	0 7 6



Old
Cat. No.

SEPARATORS.

	1212	Separators, Pear Shape, thin German, 5 oz. capacity, each	£0	4	0
722	1213	„ Cylindrical, with Stopper and Stopcock—			
		10 20 30 40 oz. capacity			
		3/ 3/6 4/ 4/6 each			
722A	1214	„ Cylindrical, with Stopper and Stopcock without extra neck—			
		5 10 20 30 40 oz. capacity			
		2/6 3/ 3/6 4/ 4/6 each			
723	1215	„ Bohemian Glass, Bulb Form, with Stopper and Stopcock—			
		Capacity about 10 20 30 40 oz.			
		Diam. of Bulb 3¼ 3½ 4½ 5¼ in.			
		7/6 8/ 8/6 9/ each			
723A	1216	„ Bohemian Glass, with Stopper, 2 Arms and Stopcock—			
		Capacity 10 20 30 40 oz.			
		Diam. of Bulb 3¼ 3½ 4½ 5¼ in.			
		8/ 8/6 9/ 10/ each			
724	1217	„ Bohemian Glass, Bulb Form, with Tubulure at side and top, Stoppered and Stopcock—			
		Capacity about 10 ounces, diameter of Bulb 3¼ in. £0 8 6			
		„ 20 „ „ 3½ „ 0 9 0			
		„ 30 „ „ 4½ „ 0 9 6			
		„ 40 „ „ 5¼ „ 0 10 6			
725	1218	„ Funnels, Bohemian Glass, with Stopcock and Ground Edge—			
		4¼ 4¾ 5¼ 6¼ 7¼ 8¾ 9¾ in. diam.			
		5/ 5/6 6/6 7/6 8/6 10/ 12/ each			
726	1219	„ Bohemian Funnels, with Glass Cover Stoppered, Stopcock and Groove in Funnel, diameter of			
		Funnel 4¾ inches £0 8 6			
		„ „ 5¼ „ 0 9 0			
726A	1220	„ Cover, with 2 Stoppers 4¾ „ 0 10 0			
		„ „ 5¼ „ 0 11 0			



S I E V E S .

Old
Cat.No.

727 1221 Sieves, Brass Wire, with Wooden Frame—

Diameter	6	6	6 in.
Mesh No.	30	60	90
	2/	2/6	3/ each

728 1222 „ Brass Wire, Japanned Tin Frame—

Diameter	3	4	6	9 in.
Mesh No.	30 1/4	1/8	2/3	3/ each
	No. 60 1/8	2/	2/6	3/6 each
	No. 90 2/	2/4	2/9	4/ each

729 1223 „ Brass Wire, with Japanned Tin Frame, Cover and Bottom—

Diameter	3	4	6	9 in.
Mesh No.	30 2/6	3/	3/9	5/ each
	No. 60 3/	3/6	4/	5/6 each
	No. 90 3/3	3/9	4/3	6/ each

730 1224 „ Brass Wire, Japanned Tin Frames, with Cover and Bottom, in sets of three, Meshes No. 30, 60, and 90—

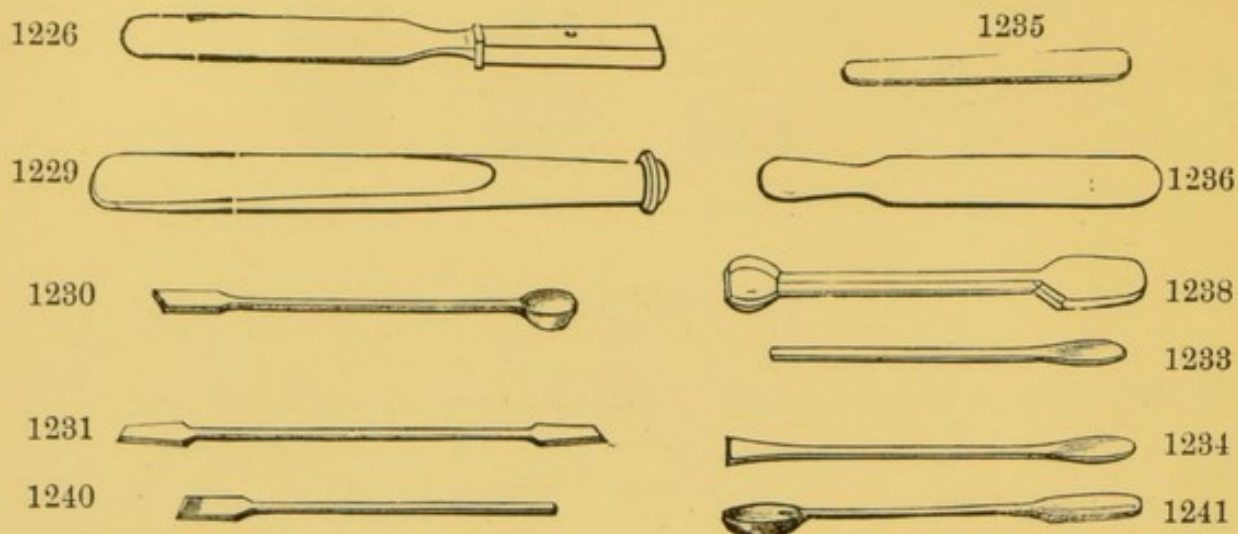
Diameter	3	4	6	9 in.
	5/6	6/6	8/6	12/6 each set

Other Sizes and Meshes of every description made to order.



1225

730A 1225 Sharpeners for Cork Borers, Brass with strong Steel Knife £0 2 0



S P A T U L A S .

Old
Cat.No.

731 1226 Spatulas or Palate Knives, Steel Blade, in Wood Balance Handle—

Length of Blade	3	4	5	6	7 in.
	7d.	8d.	9d.	10d.	1/ each

731A 1227 „ Steel, Nickel Plated to prevent Rust—

	3	4	5	6	7 in.
	1/3	1/5	1/6	1/9	2/ each

731B 1228 „ Steel, Artist's thin 4 5 inches

	1/	1/3 each
--	----	----------

732 1229 „ Berlin Porcelain—

Length	4	6	8	10	12	13 in.
	1/	1/3	2/	2/6	3/	4/ each

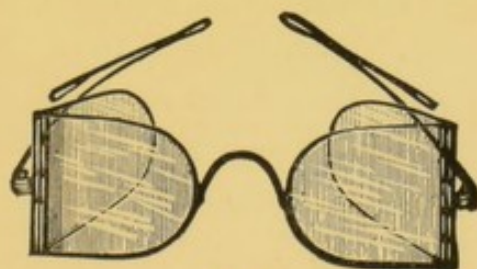
732A 1230 „ Thuringian Porcelain, with Spoon at one end—

	6	9	12	15	18 in.
	8d.	10d.	1/6	1/9	2/6 each

732B 1231 „ Thuringian Porcelain double Spatula—

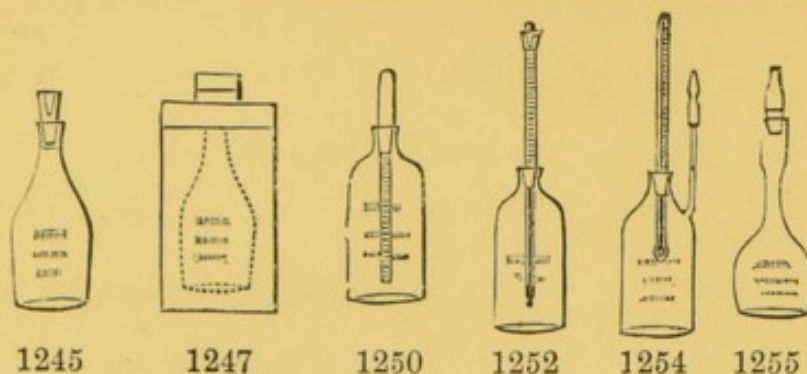
	6	9	12	15	18 in.
	8d.	10d.	1/6	1/9	2/6 each

Old Cat.No.							
732c	1232	Spatulas, Thuringian, similar to 1229 but slighter, 8½ in.					£0 1 0
732D	1233	„ Dresden Porcelain. Length 5½	8¼ in.				
				4d.	8d. each		
	1233A	„ „ „ Similar to 1231 but stouter, 12½ in.					0 1 4
732E	1234	„ „ „ Spatula End—					
			Length 8½	13 in.			
				8d.	1/6 each		
733	1235	„ Platinum. Length, 2 to 6 in., at 5/ per drachm.					
734	1236	„ Bone. Length 8 in.					0 1 0
735	1237	„ Ebonite. Length 7 8 9 in.					
			9d.	10d.	1/ each		
736	1238	„ Bohemian Glass, strong. Length 7½ in. ...					0 0 8
737	1239	„ Cut and Polished. „ 7½ „ ...					0 1 0
738	1240	„ German Glass, slighter. „ 7 „ ...					0 0 6
1592	1241	„ nickel, polished, with spoon at end, length 6 in. each					0 2 0



1242

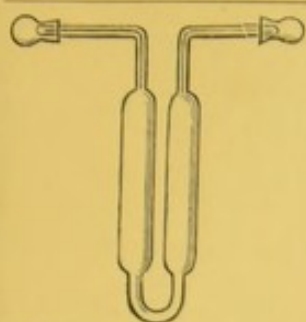
738A	1242	Spectacles, Blue Glass for Protection to the Eyes in Furnace Operations, Steel Frames ...					£0 3 6
738B	1243	Wire Gauze Protectors, with White Glass, Steel Frames					0 3 0
738c	1244	„ „ „ „ Blue Glass, Elastic Band					0 1 0



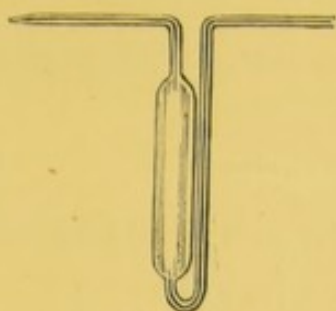
SPECIFIC GRAVITY BOTTLES.

For taking the accurate Specific Gravity of Liquids to be used with Chemical Balance.

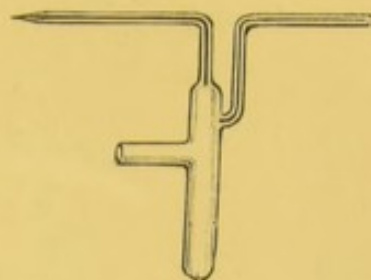
Old Cat.No.								
739	1245	Specific Gravity Bottle, with Drilled Stopper—	Capacity	10	20	25	50	100 grammes
				1/9	2/	2/6	3/	4/ each
740	1246	„	Capacity	100	250	500	1000	grains
				1/9	2/	3/	3/6	each
741	1247	„ with Brass Counterpoise, in Japanned Tin Case—	Capacity	...	25	50	100	grammes
					4/6	5/	6/	each
742	1248	„	Capacity	...	250	500	1000	grains
					4/6	4/6	5/	each
743	1249	„ with Brass Counterpoise, in Japanned Tin Case, for Beer Estimation—	Capacity	1000	grains, adjusted to 1-50th grain accuracy, each	...	...	£0 15 0
744	1250	„ with Thermometer Stopper Scale inside—	Capacity	25	grammes	...	...	0 5 6
				„	50	„	...	0 6 0
745	1251	„ „ 500 and 1000 grains	...	...	...	...	...	0 6 0
746	1252	„ with Thermometer Scale outside—	Capacity	50	grammes	...	...	0 7 0
747	1253	„ „ 500 and 1000 grains	...	...	...	...	...	0 7 0
748	1254	„ with Thermometer Stopper outside, and side Tube with mark, capacity about 25 grammes	...	...	...	...	...	0 7 6
749	1255	„ Regnault, with Stopper and mark in neck—	Capacity	25 or 50	grammes	each	...	0 2 6
750	1256	„ „ 500 or 1000 grains	„	„	„	„	„	0 2 6



Old Cat.No. 1257



1258



1259

750B	1257	Sprengel's Specific Gravity Tube, about 30 c.c.	...	£0	1	6
1674	1258	Nicols'	"	"	"	0 1 3
1675	1259	Korper's	"	"	"	0 1 6



1260



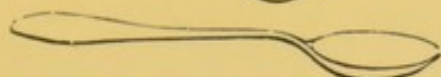
1261

1676	1260	Flask for Specific Weight of Liquids—	10	20	50	100 grammes
			1/	1/3	1/6	2/ each
1677	1261	„ for Solids, W.M.—	1/3	1/6	1/9	2/ „

1262



1263



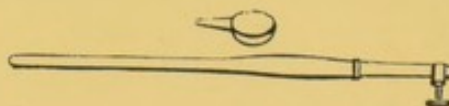
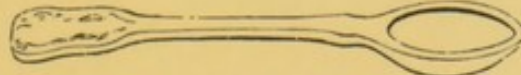
1264



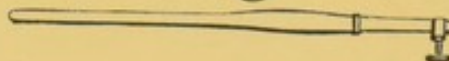
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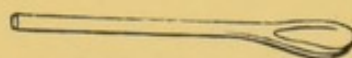
1266



1267



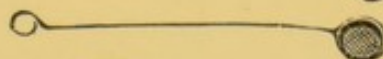
1268



1269



1270



1271



1272

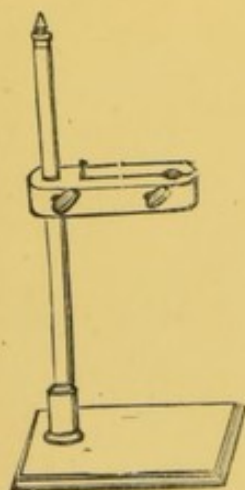
SPOONS.

751	1262	Spoon, Iron Blowpipe Test Spoon	£0	0	2
752	1263	„ Iron ...	...	...	...	0	0	3
753	1264	„ German Silver Test Spoon	...	...	...	0	0	6
754	1265	„ Glass ...	...	...	...	0	1	0

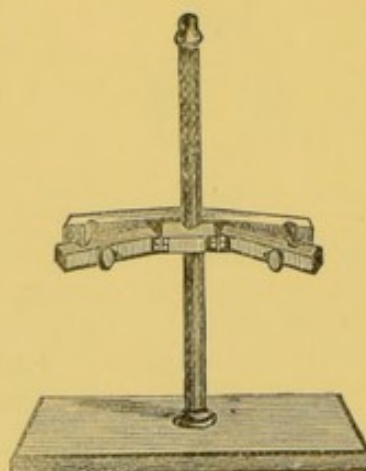
each 8d., 10d. and

Old
Cat.No.

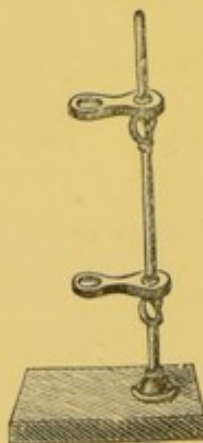
755	1266	Spoon, White Stoneware, Tea, Dessert, and Tablespoon,	each 6d., 8d. and	£0 0 10
756	1267	„ Platinum Blowpipe	1/6, 2/6, 3/6 and	0 5 0
757	1268	„ Wood Handle, with Brass End and Screw for ditto		0 1 6
758	1269	„ Porcelain, Stirrer form	each 6d. and	0 1 0
759	1270	„ „ pierced for Crystals		0 2 0
760	1271	„ Wire Gauze for Sodium and Potassium		0 1 0
760A	1272	„ „ „ „ „ with cover		0 2 0



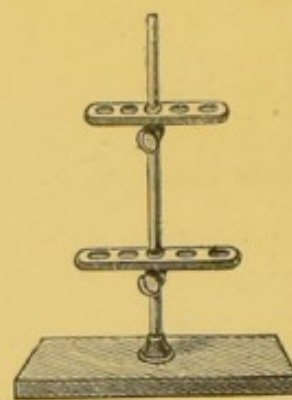
1273



1274



1275

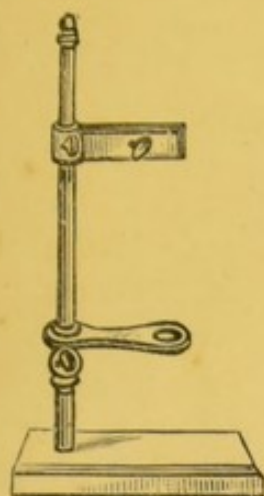


1277

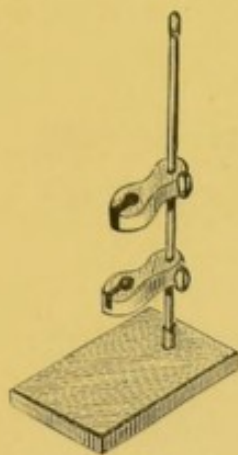
STANDS OR SUPPORTS,

For Burettes, Retorts, Flasks, Tubes, &c.

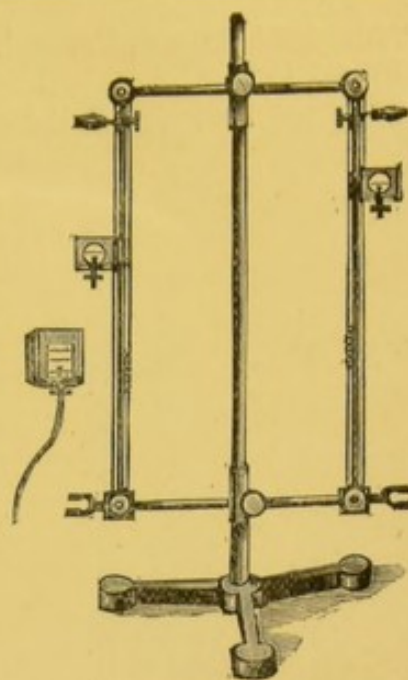
761	1273	Stand (Clamp), Polished Mahogany Ends, fitted with Cork and Boxwood Screws, for Mohr's Burettes, Tubes, &c.	Single, each	£0 4 6
762	1274	„ „ „ „ „ „	Double „	0 6 6
763	1275	„ Teak, Mohr's Burettes, for 1		0 2 0
764	1276	„ „ „ 2		0 2 6
765	1277	„ „ „ 4		0 3 6



1278

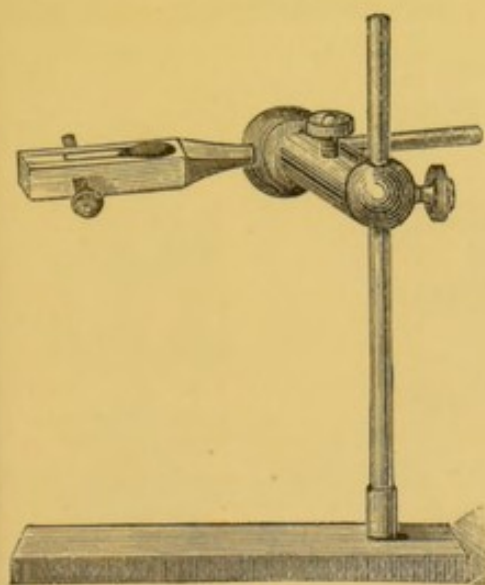


1279

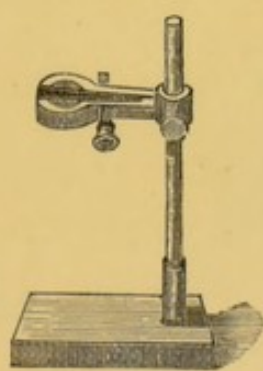


1281

	Old						
	Cat.No.						
765A	1278	Stand, Mahogany, with Clamp and Support for Mohr's Burettes	...	...	...	...	£0 5 0
765B	1279	,, ,, for Geissler's Burettes	...	...	...	...	0 4 0
	1280	,, White Wood do. do.	...	...	...	...	0 3 0
765C	1281	,, Brass, on Iron Tripod Foot, with moveable slide, and fine wires placed in front of white enamelled glass plates, for accurately reading the graduations on the Burettes. The slides also have attached a small gas jet behind the glass plate, for use at night					1 0 0



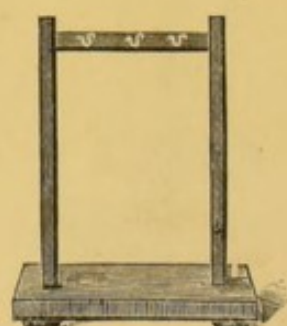
1282



1283



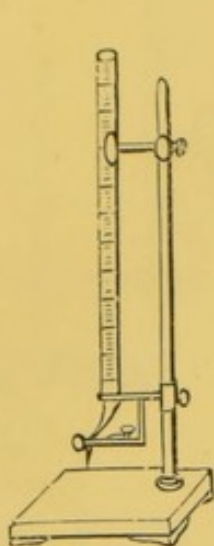
1284



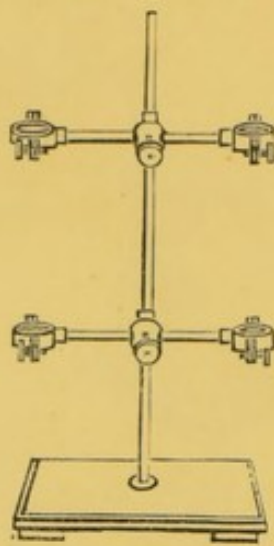
1286

765D	1282	Stand, Universal, for Retorts, Flasks, &c., end fitted with Cork, Polished Wood	...	...	...	...	£0 7 6
765E	1283	,, for Burettes, &c., Polished Wood	...	...	...	...	0 4 6

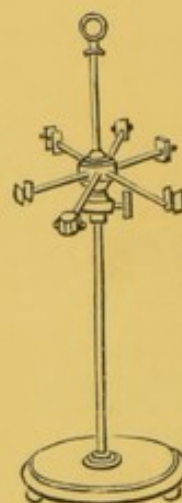
Old Cat.No.								
765F	1284	Stand, Vertical, Teak, fixed, height 11 inches	...	...	...	£0	1	9
765G	1285	" " Polished Mahogany	...	...	...	0	2	3
765H	1286	" Polished Black Wood, with 3 hooks for U Tubes, &c., height 12 inches, width 13 inches	...	each	...	0	3	0
		" " 15 " " 12 " " "	...	"	...	0	3	6



1287

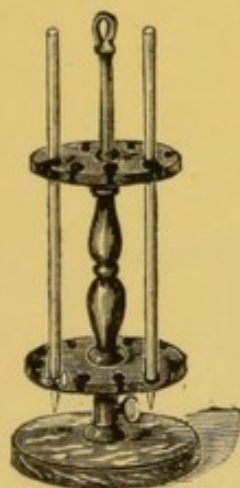


1290

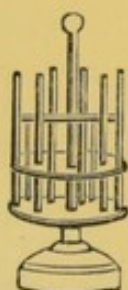


1291

766	1287	Stand for Burette, with Clip, Dr. Percy's Form, Brass Rod, and Polished Teak Foot	...	...	...	£0	7	6
767	1288	" " Iron foot and rod, dipped brass mount for 1	...	...	...	0	4	0
768	1289	" " " " " " 2	...	...	...	0	5	6
769	1290	" " Square Iron Foot, Brass Rod, Polished, best Finished, with Adjusting Screws, &c.	...	...	...	0	14	6
770	1291	" " Mounted on Round Porcelain Foot, for 6 Burettes, with Polished Brass Rod and Gun Metal Mounts. Fittings arranged so that the Burettes can be readily removed, for refilling, &c., without unscrewing	...	...	...	2	2	0



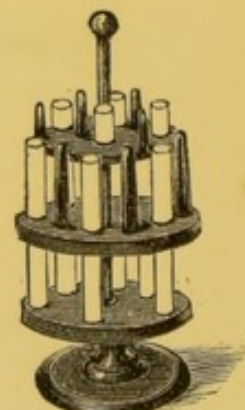
1292



1293



1295

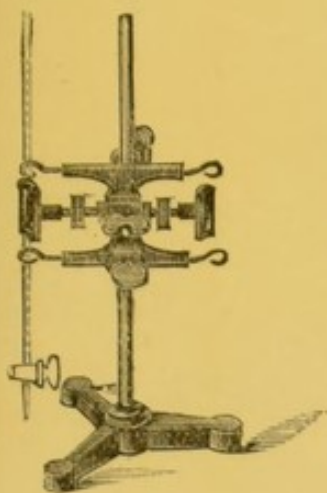


1296

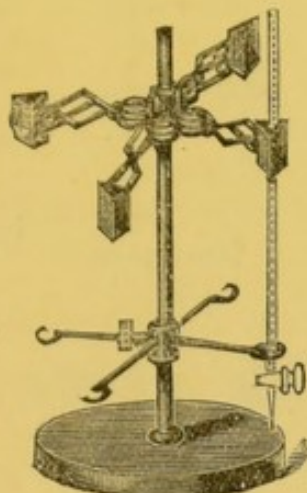
771	1292	Stand, Mahogany for 8 Burettes, with Moveable Round Stage, on Solid Marble Foot	...	...	...	£0	13	6
772	1293	" Black Wood, with Moveable Round Stage for 12 Pipettes, in Polished Black Wood	...	...	...	0	6	0
	1294	" Polished Mahogany ditto	...	...	...	0	7	6

Old
Cat.No.

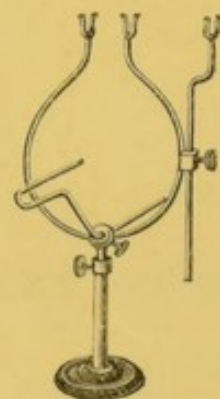
772A	1295	Stand, Teak, with Slides for Hofmann's H ₂ O ₁ Tubes ...	£0 7 6
772B	1296	Revolving, with Moveable Stage, with holes for 13 Test Tubes and 7 Pegs, Polished Black Wood ...	0 6 0
772c	1297	in Polished Mahogany	0 7 6



1298

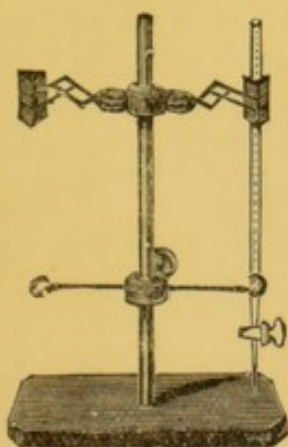


1299

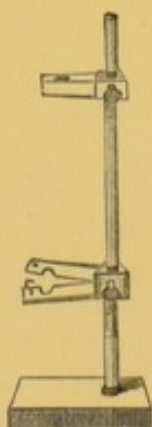


1301

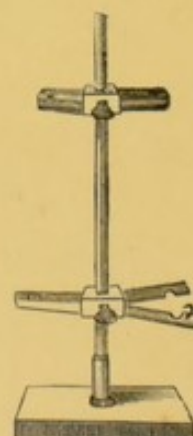
1679	1298	Stand, Universal, for 2 Burettes (Kaehler's), on tripod foot	£0 8 6
1680	1299	with spring clips, for 4 Burettes, iron foot	0 12 6
1680A	1300	porcelain foot	0 15 0
1301		Brass on Iron Foot with Sliding Rod and Support for Potash Bulbs, &c.	0 5 6



1302

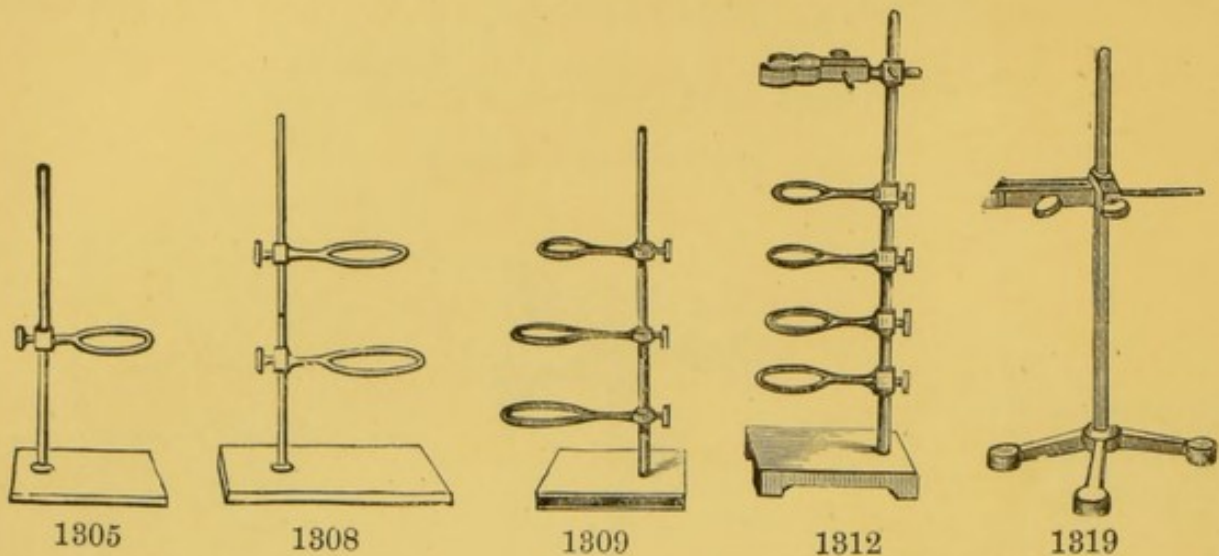


1303



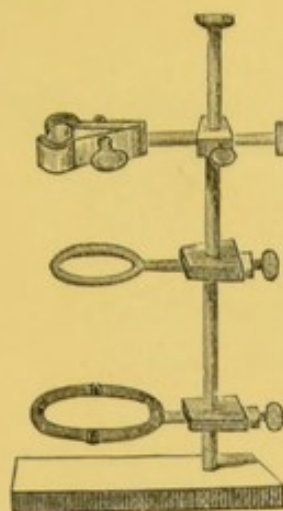
1304

1681	1302	Stand, Universal (Riedel's), with Spring Clips, for 2 Burettes	£0 8 0
1681A	1303	Teak, with Clip and Support for Mohr's Burette, with Stopcock	0 3 3
1681B	1304	ditto for 2 Burettes	0 3 9



IRON STANDS FOR RETORTS, FLASKS, &c.

Old Cat.No.					
773	1805	Retort Stand,	Iron Rod and Foot, with 1 Brass Ring, length of Rod 9 in., diameter of Ring $1\frac{3}{4}$ in.	£0	1 0
773A	1806	"	" " " 8 " " " $1\frac{3}{4}$ "	0	0 10
773B	1807	"	3 Rings, length of Rod 10 in., diameter of largest Ring 2 in....	0	1 3
774	1808	"	2 Rings, length of Rod 12 in., diameter of largest Ring $2\frac{1}{4}$ in.	0	1 9
775	1809	"	3 Rings, length of Rod 15 in., diameter of largest Ring 3 in., Brass or Iron	0	2 6
776	1810	"	3 Rings, length of Rod 17 in., diameter of largest Ring $3\frac{1}{4}$ in.	0	3 0
777	1811	"	3 Rings, length of Rod 20 in., diameter of largest Ring $4\frac{1}{4}$ in.	0	4 6
778	1812	"	4 Rings, length of Rod 24 in., diameter of largest Ring 6 in., without clamp	0	8 6
779	1813	"	Galvanized Iron, with 3 Brass Rings, Bronzed Socket, length of Rod 16 in., diameter of largest Ring $2\frac{3}{4}$ in.	0	4 6
780	1814	"	3 Rings, length of Rod 20 in., diameter of largest Ring $3\frac{3}{4}$ in.	0	6 6
781	1815	"	Galvanized Iron, Strong, with 3 Galvanized Iron Rings, Brass Sockets, length of Rod 24 in., diameter of largest Ring 5 in....	0	12 6
782	1816	"	4 Rings, length of Rod 30 in., diameter of largest Ring 6 in....	0	17 6
783	1817	"	Iron, 2 Brass Rings, Bronzed, length of Rod 24 in., diameter of largest Ring 5 in.	0	5 6
784	1818	"	with Brass Bronzed Clamp... ..	0	8 6
785	1819	Clamp,	Brass Bronzed, for Light Tubes, &c., Brass Rod 22 in. on Iron Tripod Foot... ..	0	6 0

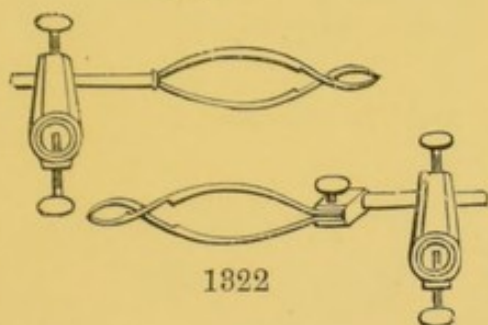


1320

Old
Cat.No.

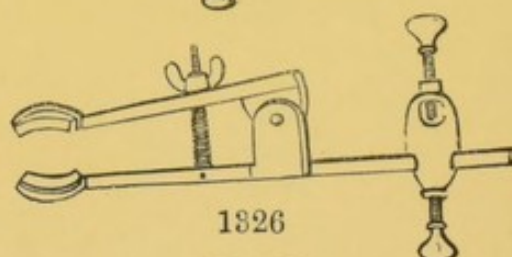
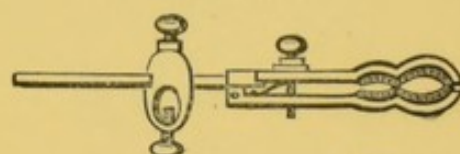
1678 1320 **Stand, Retort, Galvanized Iron**, as used at the City Guilds' Technical College, specially adapted for Students, rings cannot be removed, height 20 in. diam. of rings $2\frac{1}{2}$ & $3\frac{1}{2}$ in. £0 10 6

1321



1322

1323



1326



1328



1329



1330

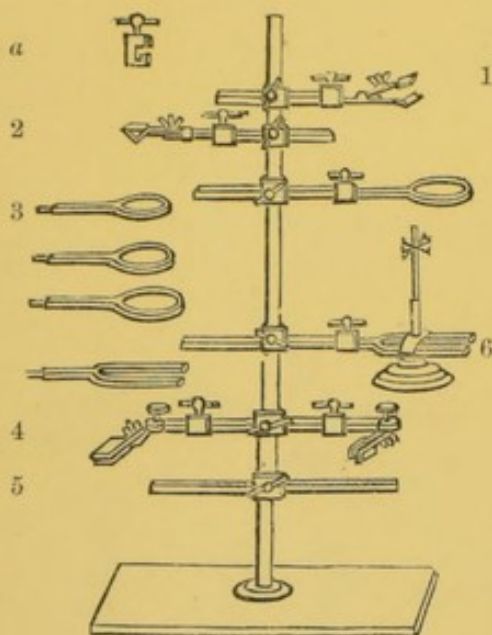
786	1321	Clamp, Brass Bronzed , with Block to fit small Retort Stands, for Test Tubes, &c. ...	£0 1 6
787	1322	" " " with Moveable Joint ...	0 2 0
788	1323	" " " for Flasks, with Block to fit on Rod of Retort Stands, stronger, ends lined with cork—Length of Vice 3 inches	0 3 0
789	1324	" " " " " 4 "	0 3 6
790	1325	" " " " " 5 "	0 4 0
791	1326	" Very strong, Solid Brass Bronzed, for Retorts, &c., ends lined with cork... ..	0 5 0
792	1327	" Ditto, Solid Bell Metal, best finished	0 7 6
792A	1328	Iron Block , with Slot or Collar for holding Rods, in either Horizontal or Perpendicular position	0 2 6
792B	1329	Vice , to secure ends of Wire Triangles, &c.... ..	0 3 0
792c	1330	Iron Block , with 2 Screws	0 3 6



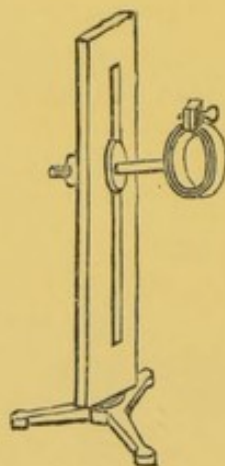
1831

Old
Cat.No.

792D 1831 **Clamp**, strong, Bronzed, fitted with cork for Horizontal or Perpendicular position £0 5 0



1832



1833

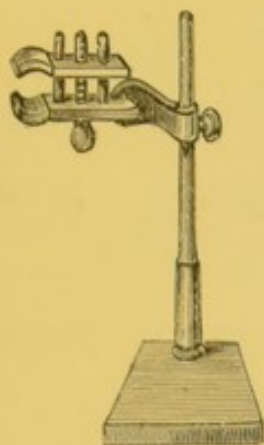


1834

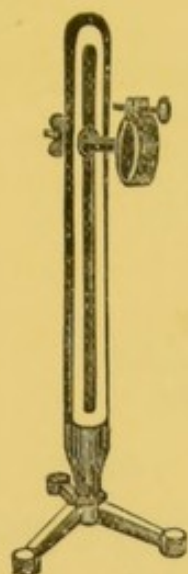
793 1832 **Universal Laboratory Stand**, consisting of a Solid Brass Rod $\frac{3}{8}$ -in. square, 28 in. high, on Cast Iron base, 12 in. \times 6 in. Fig. *a* represents a section of the Block with Screw in which either of the Rods fit and can be readily removed from the stand, if necessary, without disturbing the other parts; (1) Clamp and Rod for Burettes or Tubes; (2) Clamp and Rod, larger, for Burettes, Flasks, or small Retorts; (3) Block Clamp and 3 Rings, diameter $2\frac{1}{2}$ in., 3 in., and $4\frac{1}{2}$ in.; (4) Double Clamp, with Universal Movement, for Burettes or Tubes; (5) Rod and Clamp; (6) Fork and Bunsen's Burner, with Star Support and Chimney, Rod and Clamp. The Set complete £2 10 0

794 1833 **Stand for Glass, Liebig's, Condenser**, upright Mahogany slide support, with Brass Clamp, on Iron Tripod Foot ... 0 8 6

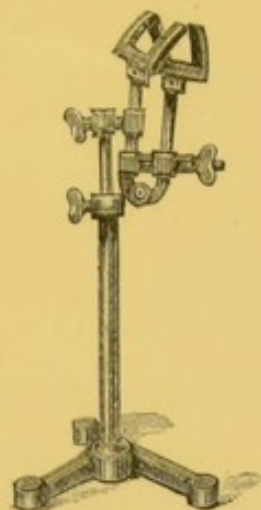
795 1834 **Stand for Glass, Liebig's Condenser**, Brass Bronzed Support, Moveable Joint, on Iron Tripod Foot 0 12 6



1335



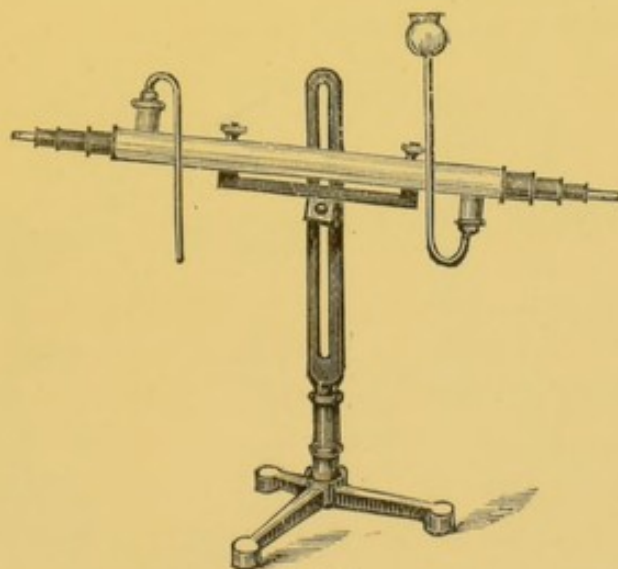
1336



1337

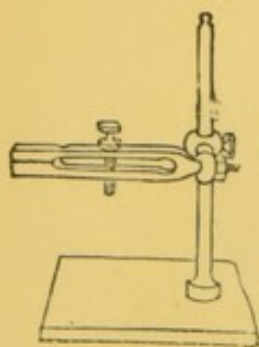
Old
Cat.No.

795A	1335	Stand, Mahogany, for Glass, Liebig's Condenser, Retorts, &c.	£0	8	6
795B	1336	" " " " on Iron Tripod Foot with Clamp	0	7	0
795C	1337	" Iron, with Sliding Rod and Clamp, Universal ...	0	7	6

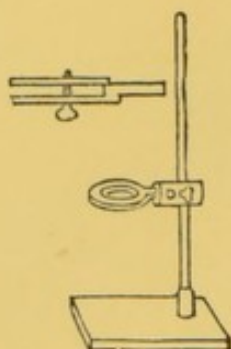


1338

795D	1338	Stand, Iron, with Brass Bronzed Support, for Glass, Liebig's Condenser, as Fig. 1334, with Mahogany Slide on Iron Tripod Foot	£0	12	6
795E	1339	Brass Bronzed Support only, with Boss to fit large Retort Stands	0	6	0



1340



1344



1345

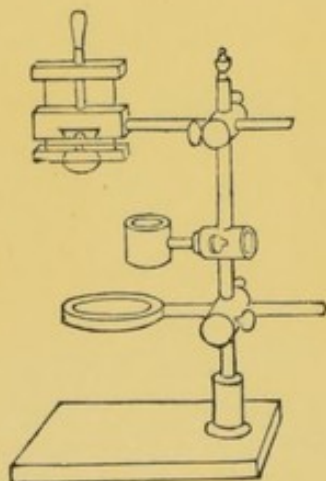


1346

WOOD STANDS, AND SUPPORTS FOR FLASKS, TUBES, &c.

Old
Cat.No.

796	1340	Stand, turned white wood, with Clamp for Retorts, Tubes, and Flasks	... ..	£0 2 6
797	1341	„ with extra joint	... ..	0 3 6
		Clamps, only to slide on rod	... 1/6 and	0 2 6
798	1342	„ Mahogany, polished, as Fig. 1340	... ..	0 4 6
799	1343	„ „ with extra joint	... ..	0 5 6
800	1344	„ with Clamp and Funnel Holder, mahogany	... ..	0 5 0
801	1345	„ Universal Holder (Bunsen's) mahogany, with Sliding Rod and Loaded Foot	... ..	0 6 0
802	1346	„ on Foot, Universal Joint (Shark)	... ..	0 3 0



1347

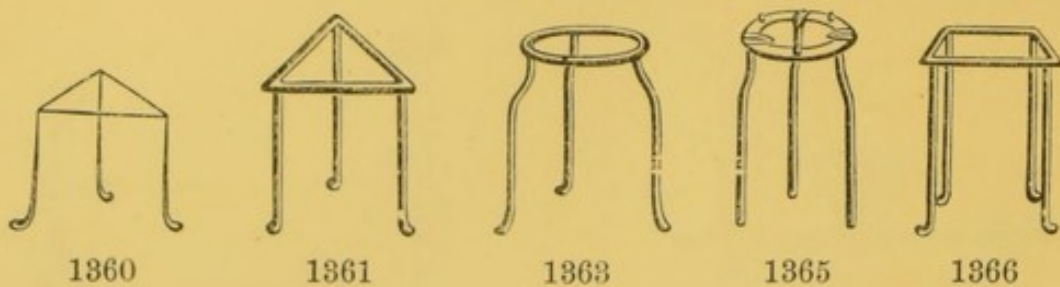


1349



1350

803	1347	Stands, Sefstrom's Universal Holder for Retorts, Flasks, &c., white wood	... ..	£0 6 6
	1348	„ ditto, polished white wood	... ..	0 7 6
804	1349	„ for Raising Apparatus (Rising Tables), polished white wood, diameter of Table 4 in. and 6 in.	... ..	0 3 0
		each 2/6 and	...	
804A	1350	„ „ with rim at the edge of the Table top, 4 in. diam.	... ..	0 3 6

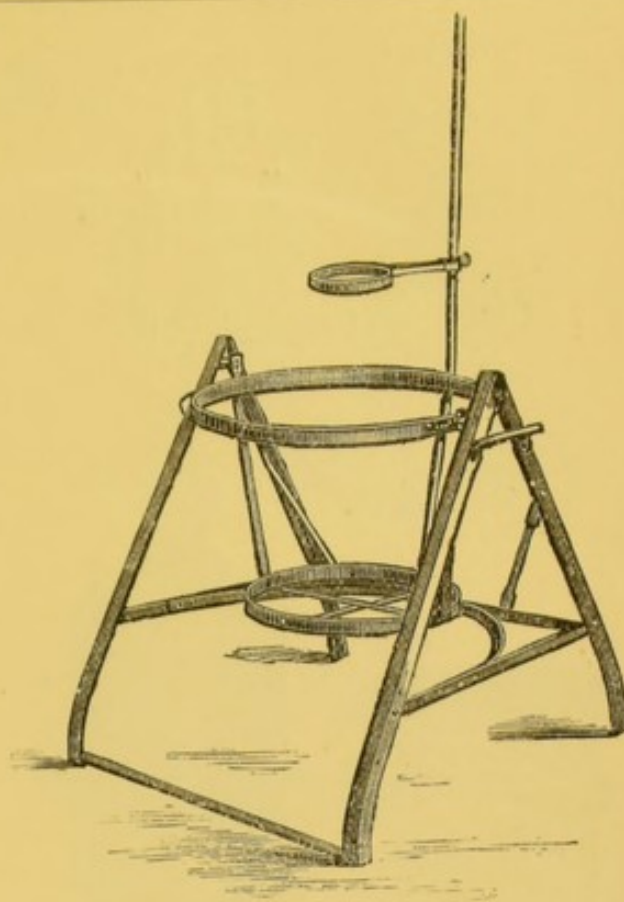


IRON TRIPODS.

Old Cat.No.							
809	1360	Tripods, Light Tinned Iron Wire ...	...	...	each 4d. and	£0	0 6
810	1361	Stout Iron Triangular—					
		Height, 6 or 7 inches, Side of Triangle, $4\frac{3}{4}$ inches				0	0 10
		„ 8 „ „ $7\frac{1}{2}$ „				0	1 0
		„ 10 „ „ $9\frac{1}{2}$ „				0	1 6
810A	1362	Galvanized Iron—					
		Height, 6 or 7 „ Side of Triangle, $4\frac{3}{4}$ „				0	1 0
		„ 8 „ „ $7\frac{1}{2}$ „				0	1 3
		„ 10 „ „ $9\frac{1}{2}$ „				0	1 9
811	1363	Round, 6 or 7 „ Diameter of Top, 4 „				0	1 0
		„ 8 „ „ 6 „				0	1 6
		„ 10 „ „ 8 „				0	2 0
811A	1364	Galvanized Iron—					
		6 or 7 „ „ 4 „				0	1 3
		8 „ „ 6 „				0	1 9
		10 „ „ $9\frac{1}{2}$ „				0	2 0
812	1365	Cast Iron Top, diameter 6 in., height 9 in., with knobs and supports, adapted for large or small vessels ...	...	...	...	0	2 6
813	1366	Quadrupods, Strong Iron, for Drying and Water Ovens, &c.—					
		Height $8\frac{1}{2}$ inches, Square at Top $5\frac{3}{4}$ inches ...				0	2 6
		„ $8\frac{1}{2}$ „ „ $6\frac{1}{4}$ „ ...				0	3 0
		„ 9 „ „ $7\frac{3}{4}$ „ ...				0	3 6
		„ 9 „ „ $8\frac{1}{4}$ „ ...				0	4 0
		Galvanized Iron 6d. to 1/ each extra.					



1367



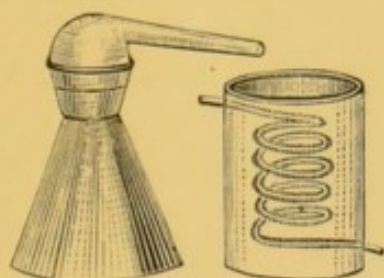
1368

Old
Cat.No.

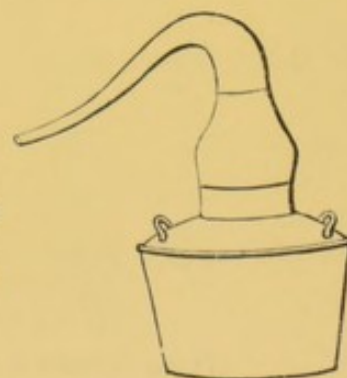
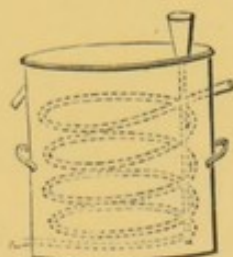
813A 1367 Stand, strong Iron, on solid Wood Bottom, for convenience in Emptying Carboys of Acid, Water, &c. £1 15 0

1368 „ Brangwin's Patent, arranged so that the Carboy is easily placed in frame and secured by ring round the neck, and can be emptied to the last drop—

Without Wheels, Japanned Iron £1 15s. ; Galvanized Iron 2 5 0
With Wheels „ „ £2 5s. ; „ „ 2 15 0



1369



1371

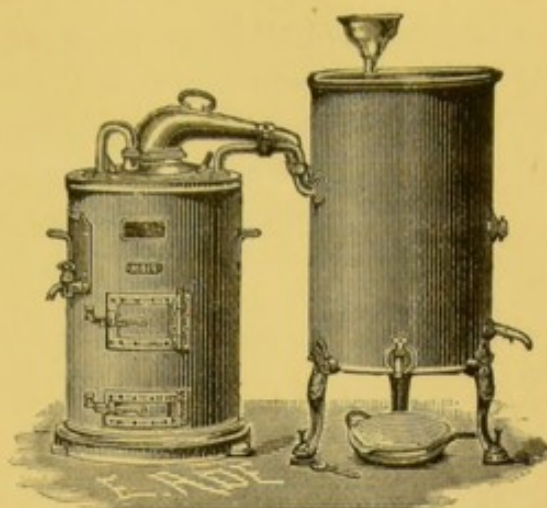
S T I L L S .

814 1369 Still, Tin Plate, with pure Tin Condensing Worm enclosed in Tin Plate Reservoir, complete.

Capacity, 1 quart	...	...	...	...	...	£0 10 0
„ 2 quarts	...	...	...	...	...	0 12 6



1878



1879

DISTILLING APPARATUS.

1878 Portable Still and Condenser, Alembic Stout Copper, Tinned Inside, arranged for removal from furnace so that it may be used for other purposes. The Alembic is provided with an opening for feeding during operation and is carefully worked so as to be steam-tight. The Copper Condenser has an angular Cooling Tube which can be easily cleaned. The Furnace is made of Wrought Iron—

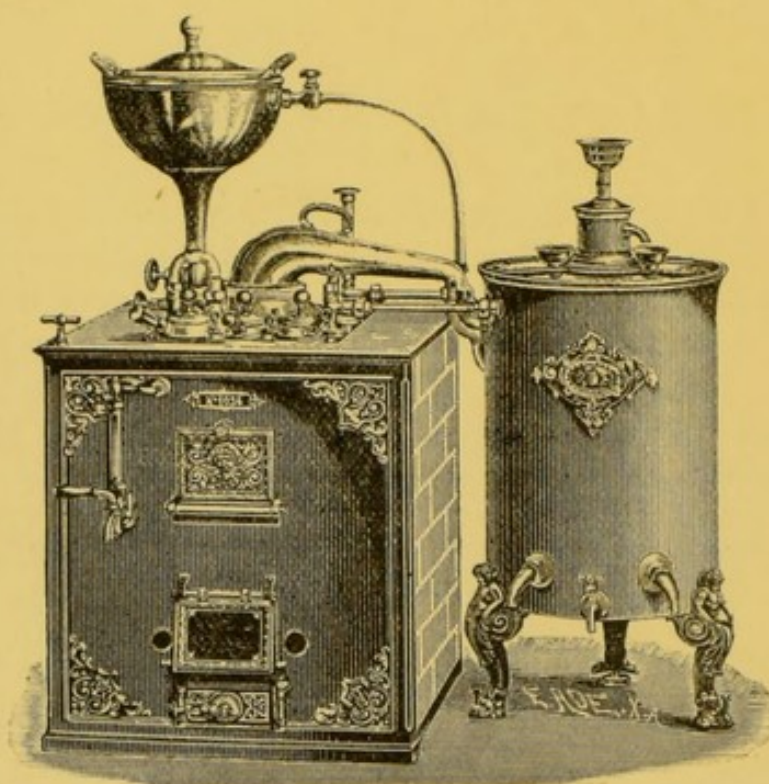
Contents of Still		18	35	52 pints	
		£9	£13 10/	£15	
9	11	13½	17½	22 gallons	
£16 10/	£19	£21	£25	£29 10/	

1879 Portable Still and Condenser, with extra Condenser for Distilled Water. The Furnace is Wrought Iron, Steam Boilers Copper, Tinned inside and closed by strong and finely polished brass plates with water level attached. The Condenser is large requiring a less frequent supply of cold water. Angular Condenser Tubes with plugs for cleaning purposes, with special worm for distilled water—

Copper Steam Boiler	5½	6½	10 gals. capacity
Alembic of Tin	10½	18	28 pints
Copper Condenser	5½	22	33 gals.
	£18 10/	£25 10/	£33

1380 Portable Distilling Apparatus.—This handsome Apparatus has met with the greatest approbation on account of its occupying so small a space and good working qualities. It is chiefly made of Wrought Iron and requires no brickwork inside, and is recommended to Pharmaceutical Chemists. Construction of top plate similar to Fig. 1381—

Steam Boiler	...	Capacity about	5½ gals.	...	about	4 gals.
Alembic with Cover	...	"	18 pints	...	"	10 pints
1 Evaporating Basin, Porcelain	...	"	4 "	...	"	2½ "
1 "	...	"	4 "	...	"	2½ "
2 Water Baths, Tin	...	"	¾ "	...	"	¾ "
1 "	...	"	½ "	...	"	½ "
1 Copper Basin	...	"	½ "	...	"	½ "
Price Complete	...	...	£30	...	...	£25

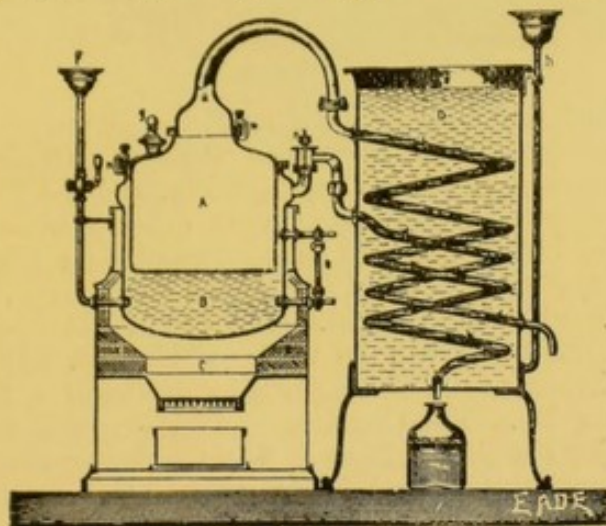


1381

1381 High Pressure Distilling Apparatus—This Apparatus is specially adapted for Pharmaceutical Chemists who make their own preparations, being very economical in Fuel, 20 lbs. of coal only being required to feed in the morning and no further attention being necessary during the whole day. It can be strongly recommended for its great efficiency, absolute purity of the distilled water, as no smoke, dust, or grease can get into the boiler, no possible danger of explosion, and constant equal temperature in the Drying Chamber, produced by a strong hot air draught inside the Furnace. The pressure of steam is from $\frac{1}{4}$ to $\frac{1}{2}$ atmosphere, is fully efficient and can be regulated for any description of distillation, evaporations, melting, syrups, &c. All the openings of the Boiler

Plates are cased separately, so that every basin can be put under steam pressure or excluded at will. Condenser on the Cylindric Cooling System, and separate worm for constant supply of Distilled Water. This Apparatus is specially adapted for Pharmaceutical Chemists in the Colonies, &c., who are necessarily compelled to make their own preparations—

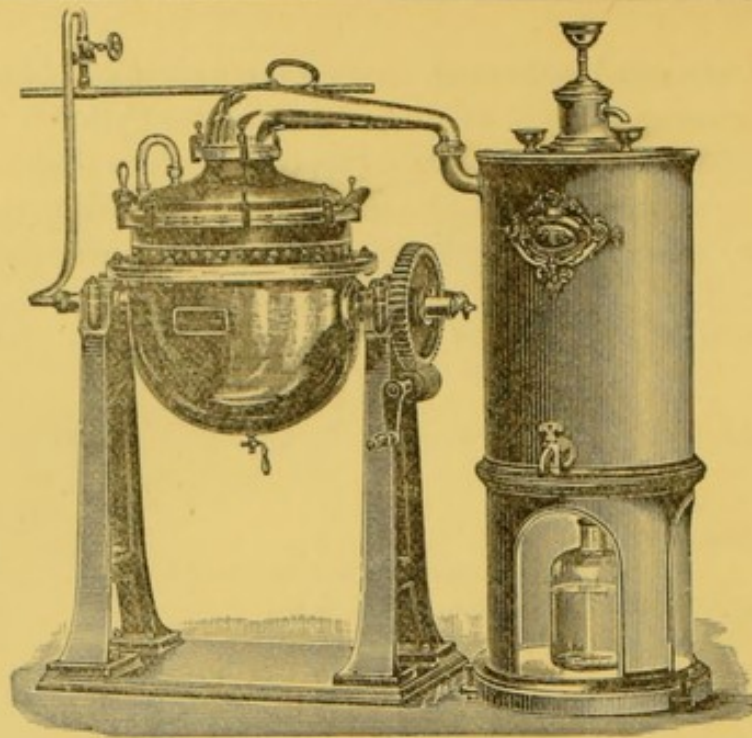
Alembic, Pure Tin	...	...	28 pints	...	18 pints
1 each Evaporating Basin of Tin	9 & 21	..	..	...	4½ & 9 ..
" " Porcelain	...	9	..	...	4½ ..
" " Copper	...	9	..	...	4½ ..
2 Water Baths, Tin	...	about	1½ ..	...	about ¾ ..
1 " " " " " "	...	..	¾ ..	...	¾ ..
1 " " Porcelain	...	..	1 ..	...	¾ ..
1 Plastrum Basin	...	..	½ ..	...	½ ..
8 Brass Covers for the openings.					
Extreme Height of the Apparatus	4 ft. 6 in.	...	...	...	3 ft. 9 in.
" Width	" "	3 ft. 1 in.	...	...	2 ft. 9 in.
Price, Complete	...	...	£75	...	£60



1882

1882 Normal Distilling Apparatus—Specially adapted for the manufacture of fine Liqueurs, Essences, Spirituous Extracts, &c. The Copper Alembic is strongly tinned and fits steam tight to the Boiler, which is made of Copper and provided with Gauge Tube and Feeding Funnel, the sides are covered with Fire Bricks to protect against burning. The Condenser, also of Copper, has 2 separate Wide Pure Tin Worms inside for Cooling the Distillate from the Alembic, also for Distilled Water from the Boiler. By turning the Valve the pressure of steam can be regulated. The Alembic can be provided with a Perforated Diaphragm and special Tube to conduct the steam from the Boilers, which in many cases is indispensable for quick Distillation—

Contents of Alembic	9	18	35	52 pints
Price complete	... £23	£30	£33	£35
Contents of Alembic	...	9	15½	22 galls.
Price complete	...	£37 10/	£45	£50

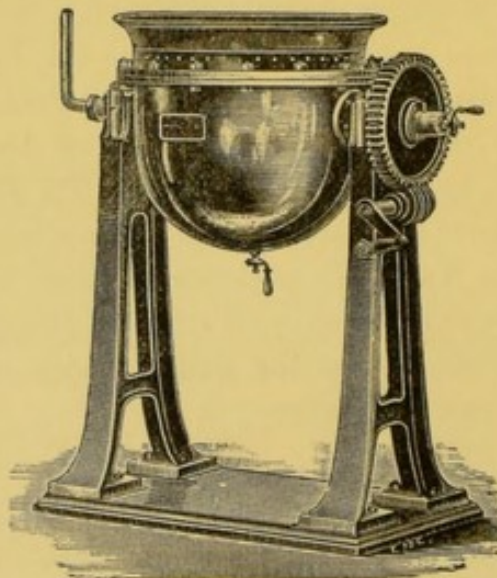


1383

1383 Steam Distilling Apparatus for manufacturing purposes on a large scale.

The Copper Steam Cauldrons are made of sufficient strength to bear a steam pressure of several atmospheres, and the liquids can be brought to boiling or evaporating point very quickly without risk of burning. By a special Tube steam can be conducted from the outer to the inner Cauldron, and underneath a Perforated Diaphragm, upon which Herbs, &c., are placed to be Distilled. The top of the Cauldron can be taken off so that the latter can be used for Syrups, Extracts, Soap, &c., as the steam influx to the Cauldron is by means of a Stuffing Box through one of the axles. The Cauldron can be emptied when in use without disconnecting the Steam Pipes. The Condenser is of Copper and on the Cylinder Cooling System. The Cauldron is constructed to stand steam pressure of 4 atmospheres, but can be altered to order—

Contents of Cauldron	11	16½	22	33	44	66	88 galls.
	£42	£45	£50	£60	£65	£80	£100



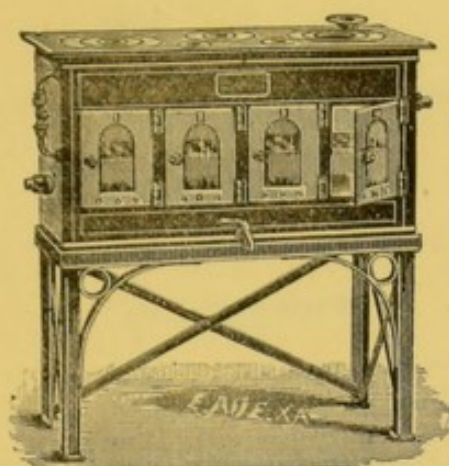
1384

Old
Cat No.

1384 **Steam Cauldron**, made of Copper, with red brass pivots, and supported on strong Iron Stand with heavy plate. The inside can be either Tinned or Nickel Plated and finely polished, and is a solid practical utensil which cannot be damaged by carelessness of Workmen. It is specially adapted for filling, emptying, or cleaning, and the heaviest Cauldron can be emptied easily without disconnecting the steam pipe, it can also be supported at any incline during boiling, &c. The prices for Steam pressure 4 atmospheres—

11	17	22	33	44 gals.
£20	£25	£30	£35	£40

If required to stand higher steam pressure the prices will be higher.



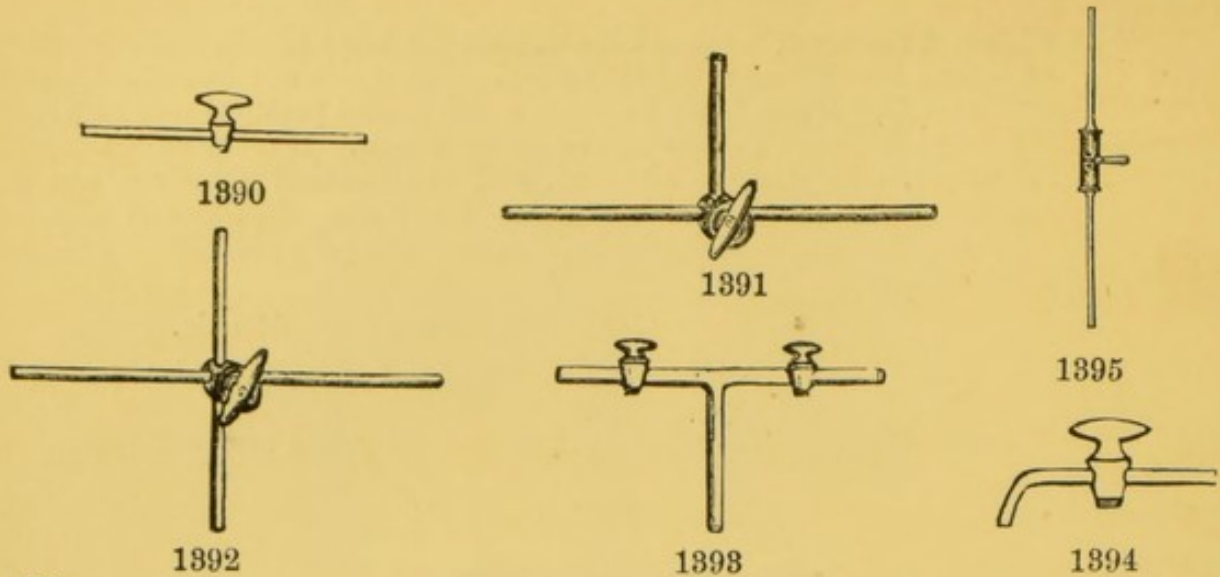
1385

1385 **Steam Drying Chamber**, with Water or Steam Bath, and can be used at the same time for evaporating, drying, and production of Distilled Water. It is made of Copper, Tinned inside for Distilled Water. The Drying Chambers 8 in. high, 6 in. wide, and 10 in. deep provided with Air Pipes for constant change of air, brass doors with glass fronts. The upper part forms a Water or Steam Bath covered by a brass plate with five openings of different sizes, the two largest 8½ in. diameter. The rings are closely fitting and so constructed that any size dish can be used or closed entirely; it is so constructed that by means of a special tube it may be converted into a Steam Bath. The chamber is supported on a strong Iron Stand at the most convenient height for working, 2 ft. 9 in.

Price complete £35 0 0

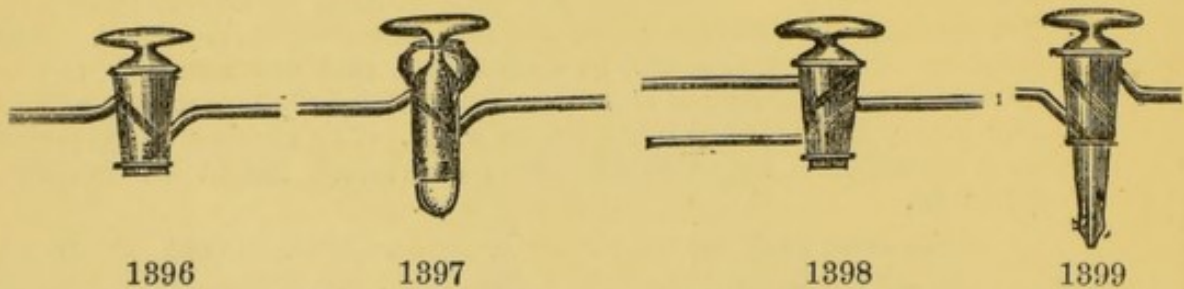
1386 **Copper Steam Drying Chambers**, Tinned inside, made to order of any size, every compartment surrounded by Steam on 5 sides, each having its own Air Pipe and separate brass door. Prices according to size. Special Sketches and Estimates given free of charge.

822	1387	Stirring Rods , Glass, length, 5 to 8 inches	... each	£0 0 2
	1388	„ „ „ cut in lengths and ends rounded, per lb.		0 2 6
822A	1389	„ „ Vulcanite, 9 × ¼ in. ... ..	... each	0 0 4



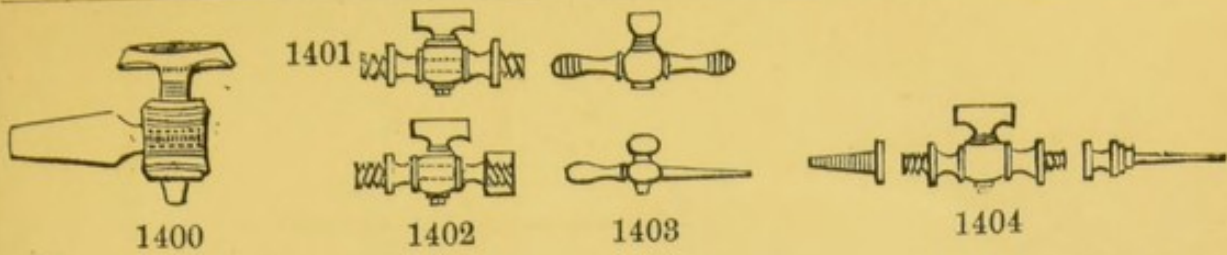
Old
Cat.No.

823	1890	Stopcock, Glass, for adapting to Tubes, &c., length 9 in.,							
		2 millimetre bore	...	...	...	£0	2	6	
		3 " "	...	...	...	0	2	9	
		4 " "	...	...	...	0	3	0	
823A	1891	" " 3 Branches ...	...	...	...	0	3	6	
823B	1892	" " 4 " "	...	...	...	0	5	0	
823C	1893	" " 2 " T Shape	...	...	...	0	4	0	
824	1894	Stopcock, Glass, larger for Aspirators, &c., 4 millimetres bore				0	3	6	
		" " " 5 " "				0	5	0	
		" " " 7 " "				0	6	0	
		" " " 10 " "				0	10	0	
1895	" "	Schmidt's Patent, 1 mm. bore, with Diaphragm							
		in centre	...	...	...	0	1	6	



Greiner and Freidrich's Patent Stopcocks, English Patent No. 1709—

1896	Stopcock, Simple, 2 mm. bore	...	...	each	£0	3	0
1897	" " with Mercury Cup	...	...	"	0	3	6
1898	" 3 way, 2 mm. bore	...	...	"	0	4	0
1899	" 3 " 2 " "	...	...	"	0	3	6



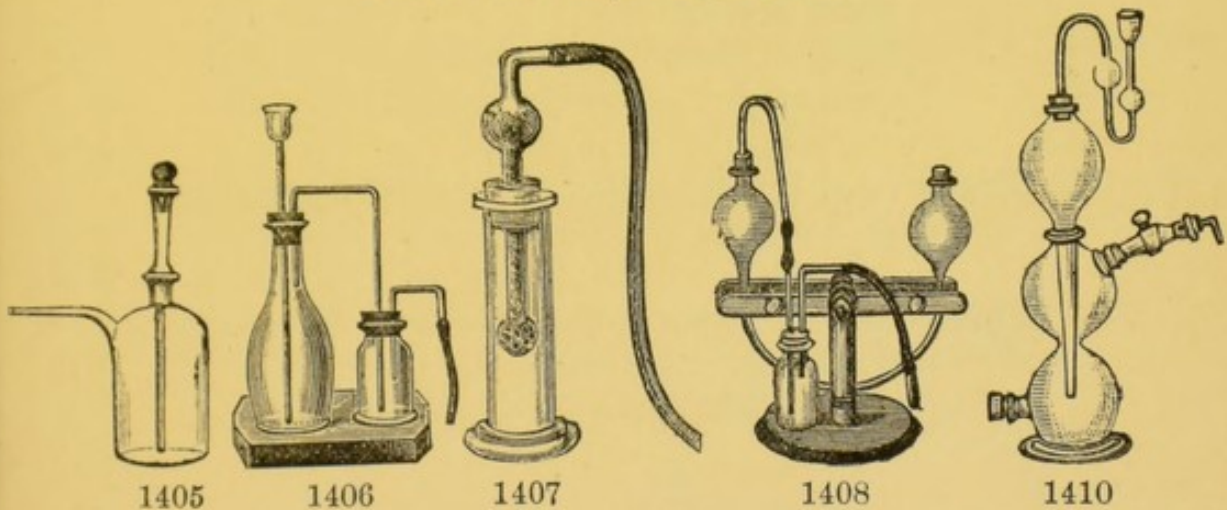
Old
Cat.No.

825 1400 Stopcock, Stoneware—

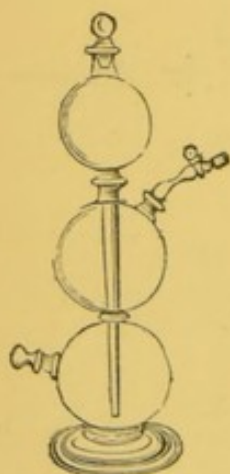
Bore	$\frac{1}{2}$	$\frac{3}{4}$	1	$1\frac{1}{4}$ in.
	3/6	5/6	10/	15/- each

826	1401	„	Brass for Gas, &c., with double Male Screws ...	£0 2 6
827	1402	„	Brass, Male and Female ...	0 3 0
828	1403	„	Ebonite, small, for chemical purposes, 2/, 2/6, 3/, 3/6, and	0 4 6
829	1404	„	Connector and Jet, Brass, small, for Marsh's Arsenic Apparatus ...	0 4 0

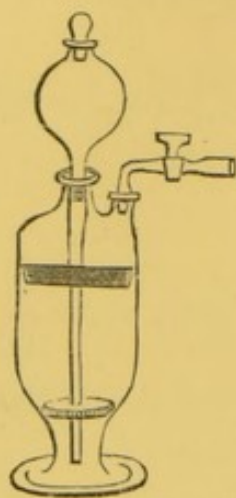
See also Gas Stopcocks, page 92.



830	1405	„	Sulphuretted Hydrogen Gas Apparatus, Small ...	£0 1 0
831	1406	„	Laboratory size, for Testing, on wooden stand, complete ...	0 3 6
	1407	„	Coram's Registered, for constant supply. The upper Tube containing the Sulphide of Iron slides through the Cork into the Acid below, and when not in use there can be no possible escape of Gas. Can be used also for Hydrogen or Carbonic Acid Gas ...	0 3 0
832	1408	„	Babos with Wash Bottle on Mahogany Stand...	0 7 6
833	1409	„	Tube with Bulbs only ...	0 1 6
834	1410	„	Kipp's Sulphuretted Hydrogen Apparatus for constant supply, small size, diameter of Bulbs, 3 inches	0 8 0
835	1411	„	Medium „ „ „ 4 „	0 10 6
836	1412	„	Large „ „ „ 5 „	0 12 0



1418



1414



1415



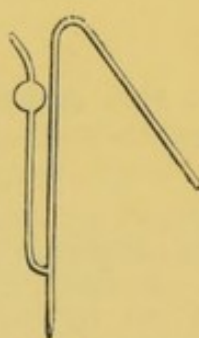
1416

Old
Cat.No.

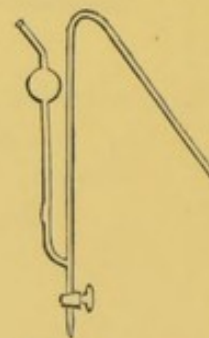
837	1418	Kipp's Sulphuretted Hydrogen Apparatus, Bohemian Glass Stopcock and Stoppers accurately ground, Diam. of Centre Bulb, 6 in. ...	£1 1 0
		Extra large size ,, ,, 7½ ,, ...	1 10 0
838	1414	Bohemian Glass, the generator is divided in the centre, and accurately ground, with Glass Stopcock	1 15 0
1681c	1415	Sulphuretted Hydrogen Gas Generating Apparatus with Cover and Stopcock—Height 12½ in. Diam. 3¼ in.	0 10 6
		24 in. ,, 8 in.	1 6 0
	1416	Sulphuretted-Hydrogen or Carbonic Acid Apparatus for constant supply, with Porcelain Star Disc in Cylinder, 2 Stopcocks and Safety Funnel with 2 Valves, on Stand	0 15 0



1417

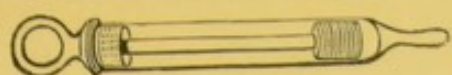


1418

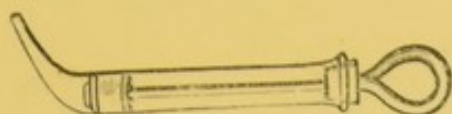


1419

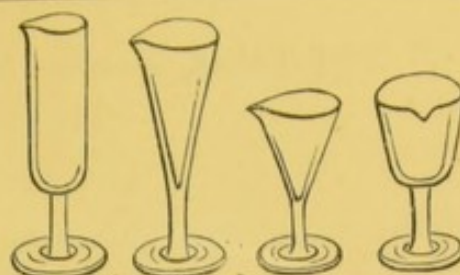
839	1417	Syphons, Glass, Plain each 4d., 6d., and	£0 0 8
840	1418	,, ,, with Suction Tube, as Fig. 1418, or bent at right angles, either form, Arm 12 in., each	0 1 0
		,, 15 ,, ,,	0 1 3
		,, 18 ,, ,,	0 1 6
841	1419	,, with Glass Stopcock for Acids, &c. ,, 18 ,, ,,	0 3 6



1420



1421



1423 1425 1422

Old Cat.No.	1420	Syringes, Glass	...	...	...	each	6d., 9d., 1/, and	£0 1 6		
842A	1421	"	"	with bent point for decanting Liquids from Precipitates	...	...	...	0 1 0		
843	1422	Test Glasses,	Bohemian Glass, either form, same price—	1	2	3	4	5	6	ozs. capacity	
				3d.	4d.	5d.	6d.	7d.	8d.	each	
844	1423	"	"	Cylindrical, with Foot, Clear White English Glass—							
				2	4	6	8	12	16	ozs. capacity	
				6d.	8d.	10d.	1/-	1/6	2/-	each	
844A	1424	"	"	Clear German Glass—							
				2	4	6	8	ozs. capacity			
				5d.	6d.	7d.	8d.	each			
845	1425	"	"	Tall Conical Form, for Urine Testing							£0 1 0



1426



1427



1430



1432

TEST TUBES.

846 1426 Test Tubes, best Bohemian Glass, for boiling or heating over Spirit Lamps or Gas—

Length	2	2	3	3	4	4	4	5	inches
Diameter	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	"
	3d.	4d.	4d.	4d.	5d.	6d.	7d.	6d.	per doz.
	2/	2/6	2/6	3/	3/9	5/	6/	5/	per gross
Length	5	5	6	6	6	6	6	7	inches
Diameter	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	$\frac{3}{4}$	"	
	6d.	8d.	7d.	8d.	9d.	1/	11d.	per doz.	
	5/6	7/	6/	7/	8/	11/	10/	per gross	

Packed in Cardboard Cases, containing $\frac{1}{2}$ and 1 gross, according to size. Quantities less than One Gross charged at per dozen.

Old
Cat.No.

847	1427	Test Tubes, nested in Cardboard Cases—Nest of 6	each	£0 0 9
			„ 9 „	0 1 0
			„ 12 „	0 1 6

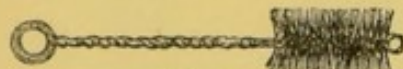
847A	1428	„	Nest of 6, largest 5 in. \times $\frac{3}{4}$ in. diameter, without Cardboard Cases—per dozen Nests	0 6 0
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847B	1429	„	Ignition for Blowpipe Purposes—	
			2 in. \times $\frac{1}{4}$ in., per doz., 2 $\frac{1}{2}$ d.,	per gross 0 1 9
			2 in. \times $\frac{1}{2}$ in., „ 2 $\frac{1}{2}$ d.,	„ 0 1 9

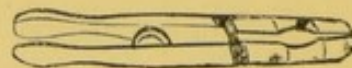
848	1430	Boiling Tubes—										
		Length	6	6	7	7	7	8	8	8	9	10 in.
		Diameter	1	1 $\frac{1}{4}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1	1 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$ in.
			1/	1/4	1/2	1/6	2/	1/4	1/9	2/	2/6	3/ per doz.

849	1431	Test Tubes, Hardest Bohemian Combustion Glass, for Oxygen, 6 in. \times $\frac{3}{4}$ in.	each	£0 0 4
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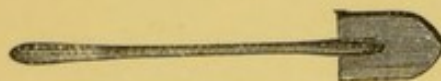
850	1432	Test Tubes, on Foot—							
		Length	4	5	6	6 inches			
		Diameter	$\frac{5}{8}$	$\frac{5}{8}$	$\frac{3}{4}$	1 „			
			1/3	1/6	1/9	2/ per doz.			



1433



1440



1436



1439

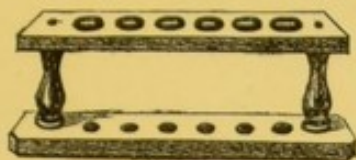


1441

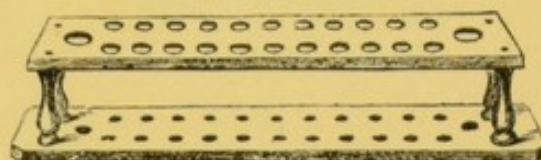
851	1433	Test Tube Cleaners, (Brushes)	... ..	each 1 $\frac{1}{2}$ d., per doz.	£0 1 0
	1434	„	„ Best with sponge or bristle ends	each 2d., per doz.	0 1 9
	1435	„	„	„ 3d., „	0 2 6
851A	1436	„	„ with flat India-rubber ends	... ..	each 0 0 3
852	1437	„	„ Long Stem for Tubes, Burettes, &c., 9d. and		0 1 0
853	1438	„	„ Bottle Brushes	... ..	each 3d. and 0 0 4

Old
Cat.No.

854	1439	Test Tube Holders, for the Hand, Brass Wire in Wood Handle	£0 0 6
855	1440	„ „ Turned White Wood	0 0 6
856	1441	„ „ Flat Form, Strong Spring Clip, in Wood Handle	0 0 10



1442

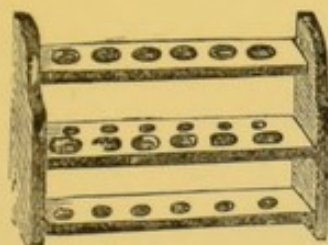


1442

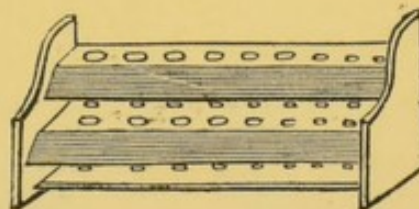
TEST TUBE STANDS.

857 1442 Test Tube Stand, Teak, on one Stage—

6	8	12	24 holes
7d.	9d.	1/	2/ each



1443



1445

858 1443 Test Tube Stand, Teak, on two Stages—

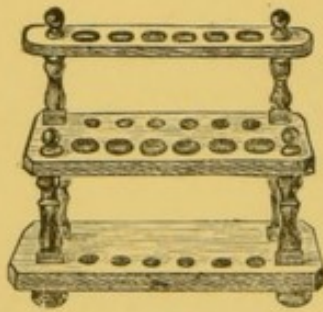
12	18	24 holes
1/	1/9	2/6 each

859 1444 „ „ Polished Mahogany, on two Stages, best make—

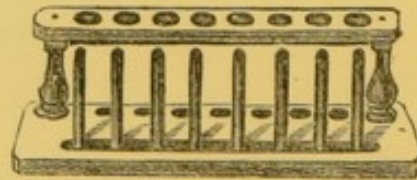
12	18	24 holes
2/	3/6	4/6 each

860 1445 „ „ Mahogany, with Slate Tablets—

12	18	24 holes
2/6	3/6	4/6 each



1446



1447

Old
Cat.No.

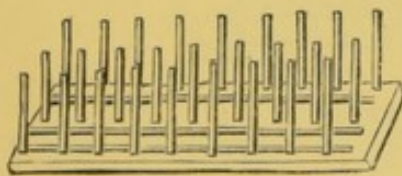
861 1446 Test Tube Stand, Polished Turned Boxwood Pillars and Nuts to unscrew, for Portability—

12	18	24 holes
4/	4/6	5/6 each

862 1447 „ „ Teak, with Draining Pegs—

6	8	12	24 holes and pegs
1/	1/3	2/	2/6 each

862A 1448 „ „ 8 Holes with Stoneware Draining Pegs... £0 2 0
 12 „ „ „ ... 0 2 6



1449



1452



1453

863 1449 Test Tube Stand, Teak, Draining Pegs only—

Set of 12	18	24	36
1/6	2/	2/6	3/6

863B 1450 „ Stoneware Pegs only, Set of 24 36

863c 1451 „ „ 3/ 3/6

863D 1452 „ Wicker Baskets each £0 0 6

863E 1453 „ Support, Stoneware, with 6 holes for digestion, on Sand Bath 0 0 6

THERMOMETERS.

To reduce Centigrade degrees to those of Fahrenheit.

RULE.—Multiply by 9, divide by 5, and add 32. Thus:—

$$\begin{array}{r} \text{Cent.} \qquad \qquad \qquad \text{Fahr.} \\ 40 \times 9 \div 5 + 32 = 104. \end{array}$$

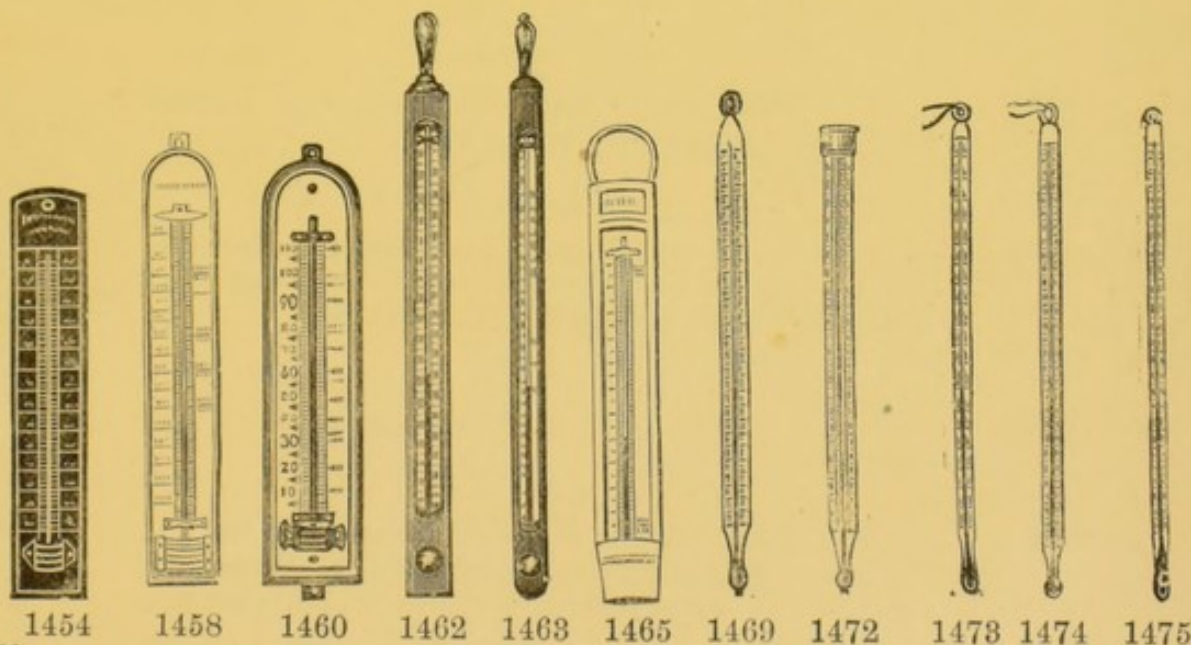
To reduce Fahrenheit's degrees to those of Centigrade.

RULE.—Subtract 32, multiply by 5, and divide by 9. Thus:—

$$\begin{array}{r} \text{Fahr.} \qquad \qquad \qquad \text{Cent.} \\ 104 - 32 \times 5 \div 9 = 40. \end{array}$$

Thermometrical Equivalents.

FAHR.	CENT.		FAHR.	CENT.
600° ...	315.55°		180° ...	82.22°
500° ...	260°		150° ...	65.55°
400° ...	204.44°		100° ...	37.77°
300° ...	149°		60° ...	15.55°
266° ...	130°		32° ...	0°
212° ...	100°		0° ...	−17.77°



Old Cat.No.	No.	Description	Length	Price
863A	1454	Thermometer, black wood, polished, Double Scale, to 140° Fahrenheit, Spirit Column,	length 6 inches	£0 0 6
863F	1455	" " " " " " " "	8 "	0 0 8
863G	1456	" " Mercury " " " "	8 "	0 0 9
863H	1457	" " " " " " " "	10 "	0 0 10

Old Cat.No.						
864	1458	Thermometer, Boxwood Scale, to 140° Fahrenheit	...	£0	1	0
864A	1459	" " 240° "	...	0	1	6
864B	1460	" bold Figures on Enamelled Glass, and Oak Frame, 10 × 2 inches, to 120° Fahrenheit		0	2	6
864D	1461	" White Porcelain, with Black Indelible Figures, 9 inches × 2½ inches, 180° F. and 82° C., Similar to Fig. 1460	... ..	0	3	0
864E	1462	" Bath or Chemical, Paper Scale, enclosed in Glass Tube, protected by an outer white wood case, scale 20° to 180° F., with or without Dr. Forbes' Scale, length of Thermometer, exclusive of case	... .. 8 inch	0	1	3
		" " 0° to 210°	... .. 12 "	0	2	6
864F	1463	" in polished hard wood case	... .. 7 "	0	1	6
865	1464	" Boxwood Scale, with jointed back, 240° Fahr.		0	3	6
866	1465	" Plated Scale, Enamel Tubes, in Japanned tin case, for baths or Brewers' use, to 240° Fahr.—				
		8	10	12	14 inches length of scale	
		2/	2/6	3/6	4/ each	
	1466	" Copper Case for Brewers' use, Enamel Tubes, Plated Metal Scale—				
		8	10	12	14 inches length	
		3/6	4/	5/	6/ each	
	1467	" Best Stout Scale 14 inches, in rivetted Copper Case, 80° to 220° F.	... ..	£0	12	6
	1468	" " Coolers, 80° to 100° F....	... ..	0	12	6
867	1469	" for Chemical use, Paper Scale, enclosed in glass tube about 5/8ths inch diam., and cardboard case, to 230° Fahrenheit	... ..	0	1	6
		" " 350° "	... ..	0	2	0
868	1470	" " 200° Centigrade	... ..	0	1	6
		" " 300° "	... ..	0	2	0
	1471	" Dairy, Paper Scale 5/8ths diam., to 160° F., indicating Freezing, Churning Cheese, and Scalding, length 10 inches, in cardboard case		0	1	0
869	1472	" for Chemical use, Milk Glass Scale, enclosed in glass tube about 5/8ths inch diam., and cardboard case, brass top, graduated—				
		240° Fahrenheit...	... ..	0	2	6
		350° " ...	... ..	0	3	0
		200° Centigrade ...	... ..	0	2	6
		300° " ...	... ..	0	3	0

Old
Cat.No.

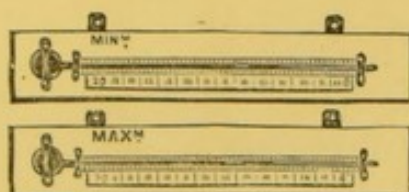
870	1473	Thermometer, narrow to pass through cork, Paper Scale, enclosed in glass tube about $\frac{3}{8}$ inch diam., and cardboard case—			
		240° Fahrenheit	£0	2	0
		400° „	0	2	0
		600° „	0	2	6
		200° Centigrade	0	2	0
		300° „	0	2	6
871	1474	„ for Chemical use, Milk Glass Scale, enclosed in glass tube $\frac{3}{8}$ in. diameter in cardboard case—			
		240° Fahrenheit... ..	0	2	6
		400° „	0	3	0
		600° „	0	3	6
		200° Centigrade	0	2	6
		300° „	0	3	6
872	1475	„ for Chemical use, best make, accurately pointed, graduated on solid stem, and enamelled back, in cardboard case, diameter, about $\frac{1}{4}$ in.; graduated in single degrees—			
		to 150° Fahrenheit, length 12 inches ...	0	3	6
873	1476	„ to 240° or 400° Fahr.	0	4	0
874	1477	„ to 600° Fahr., length 16 in.	0	4	6
875	1478	„ In cardboard case, diameter about $\frac{1}{4}$ inch—			
		100° Centigrade, length 12 inches,	0	3	9
		200° „	0	4	0
876	1479	„ 300° „ length 16 inches ...	0	4	6
876A	1480	„ for Chemical use, double Milk Scale—			
		$\frac{5}{8}$ in. diam., about 200° Cent. and 400° Fahr.	0	3	0
876B	1481	„ $\frac{5}{8}$ „ „ 300° „ „ 600 „	0	4	0
876C	1482	„ $\frac{3}{8}$ „ „ 200° „ „ 400 „	0	3	6
876D	1483	„ $\frac{3}{8}$ „ „ 300° „ „ 600 „	0	4	6
876E	1484	„ Enamelled back, double scale, graduated on stem, about 200° Cent, and 400° Fahr.	0	4	6
876F	1485	„ „ 300° „ „ 600° „	0	5	6



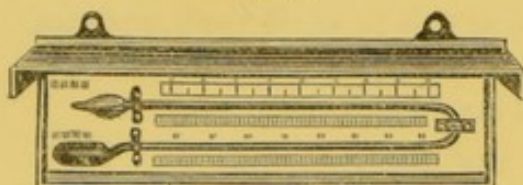
1486



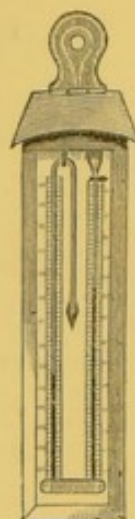
1487



1488



1489



1490



1491



1492

Old
Cat.No.

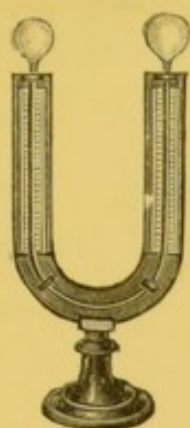
1486 **Thermometer**, Milk Glass Scale for Boilers, Stout Brass Scale about 12 inches, total length about 3 feet, enclosed in Copper Tube Case—

100°	200°	350° Cent.
240°	400°	600° Fahr.
36/	38/	40/ each

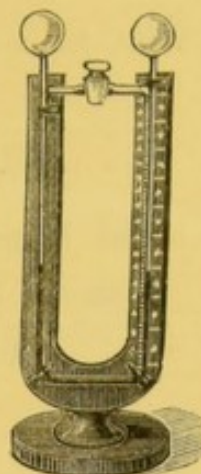
877	1487	..	Clinical , enamelled scale, in black wood case	£0 6 0
877A	1488	..	Maximum , self-registering, boxwood scale 3/ and	0 5 6
		..	Minimum .. 3/ and (Bent to prevent index being shaken into bulb)	0 5 6
877B	1489	..	Maximum and Minimum .. or metal	0 10 6
877C	1490	..	Sixe's Self-Registering Maximum and Minimum , on metal scale, in japanned frame with Magnet	0 15 0
878	1491	..	for Specific Gravity Bottle, with Bare Bulb, Ivory Scale graduated to 110° Fahr., in Leather Case	0 7 0
879	1492	..	for Wine Test, and can be used as a Stirrer, Plated Scale, graduated to 110° Fahr., in Leather Case	0 7 6

Thermometers for Chemical purposes, Boilers, &c.. enclosed in Copper Cases made to order.

Thermometers for Benzole Testing, see 1591 & 1592.



1493



1494

Old
Cat.No.

880	1493	Thermometer, Leslie's Differential, on Stand	...	...	£0	4	0
		„ „ Milk Scale, Polished Stand			0	6	0
880A	1494	„ „ „ with Stopcock			0	8	6
881	1495	Thermometer Tube, Plain Stem, 9 inches long, bulb about $\frac{3}{4}$ in. diameter	...	...	0	0	3
882	1496	Thermometer Tube, filled with Mercury...	...	...	0	0	6
883	1497	Thompson's Calorimeter or Fuel Tester, for determining the heating power of Coal, &c., complete in Mahogany case	...	...	6	6	0



1498



1500



1501



1503

TILES FOR TESTING.

884	1498	Tiles, for Colour Testing, Berlin Biscuit Porcelain—				
			$2\frac{3}{4} \times 1\frac{1}{2}$	$3\frac{1}{4} \times 2\frac{1}{4}$	$4 \times 2\frac{1}{2}$	$5\frac{1}{2} \times 3\frac{3}{4}$ inch
			7d.	8d.	9d.	10d. each
885	1499	„ „ Biscuit Meissen Porcelain	$4 \times 2\frac{1}{2}$ in.	...	...	0 1 0
886	1500	„ „ Berlin Porcelain, with 12 cavities	$4\frac{1}{4} \times 3\frac{3}{8}$ in.	...	...	0 1 6
887	1501	„ White Stoneware, Glazed on one side—				
			5	6	7	8 inch square
			6d.	7d.	9d.	1/ each

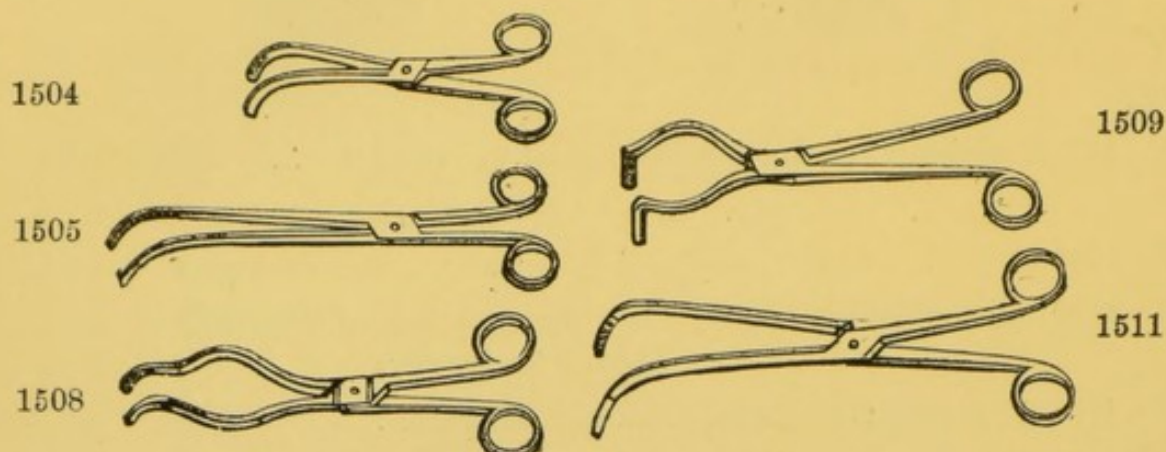
Old
Cat.No.

888 1502 Tiles, White Stoneware, Glazed on both sides—

5	6	7	8	10	12 inch square
8d.	10d.	1/	1/6	2/6	3/6 each

889 1503 ,, Round, Porous, for Drying Crystals—

Diameter 5	8	10	12 inches
6d.	1/	2/	2/6 each



SMALL CRUCIBLE TONGS.

890 1504 Crucible Tongs, Bright Iron—

Length 6	7	9	11	16 inches
1/	1/3	1/6	1/9	3/6 each

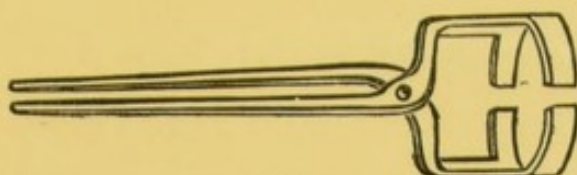
891	1505	Crucible Tongs, Polished Brass	6 inches	...	each	£0	1	0
			7	..	..	0	1	6
			8	..	..	0	2	0
891A	1506	,, German Silver	8	..	..	0	5	0
892	1507	,, Light Steel	8	..	..	0	2	6
893	1508	,, Brass, with Bow	9	..	..	0	2	6
894	1509	,, German Silver	8	..	..	0	5	0
895	1510	,, Polished Steel	8	..	..	0	2	0
895A	1511	,, ,, Nickel Plated	8	..	..	0	2	6
896	1512	,, ,, ,,	9	..	with Platinum Ends,			
					12/6 and	0	15	0
896A	1513	,, Brass	8	..	..	0	12	6
1593	1514	,, Nickel, Polished, with Bow, 8 in.			each	0	8	6



1515



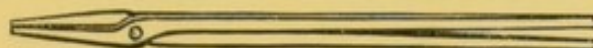
1516



1517

ASSAY TONGS.

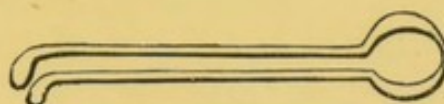
Old Cat.No.									
897	1515	Bow Tongs, Iron, length 14 inches	...	...	...	£0	2	0	
		" " 18 "	...	...	...	0	3	0	
		" " 24 "	...	...	...	0	4	0	
898	1516	" " with bend, length 18 inches	...	...	...	0	4	6	
		" " " 20 "	...	...	...	0	6	0	
899	1517	Basket Tongs, Iron, length 24 inches	...	...	...	0	6	0	
		" " 28 "	...	...	...	0	7	6	
		" " 32 "	...	...	...	0	8	6	



1518



1519



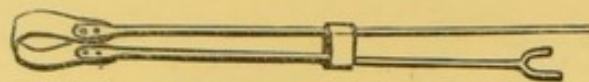
1520

900	1518	Straight Tongs, Iron, length 14 inches	...	...	...	£0	2	0
		" " 18 "	...	...	...	0	2	6
		" " 24 "	...	...	...	0	3	0
901	1519	Furnace Tongs, with Bend, length, 14 inches	...	...	...	0	2	0
		" " 18 "	...	...	...	0	2	6
		" " 24 "	...	...	...	0	3	6
902	1520	Charcoal Tongs, length, 14 inches	...	...	...	0	2	0
		16 "	...	...	...	0	2	6
		18 "	...	...	...	0	3	0



1522

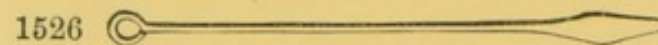
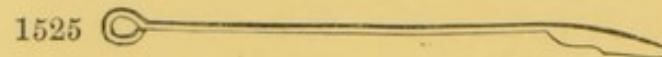
903	1521	Cupel Tongs, long Iron, for removing Cupels, Elastic Iron and Band, length 36 inches	...	...	...	0	5	0
904	1522	" Elastic Iron, length 28 "	...	...	...	0	3	6
		" " 34 "	...	...	...	0	4	0
		" " 38 "	...	...	...	0	5	0



1523

Old
Cat.No.

905	1523	Scorifier Tongs, Spring, length 24 inches ...	...	...	£0 3 0
		" " 32 " ... ..	...	...	0 4 6



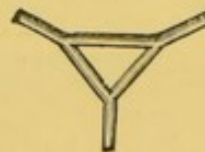
906	1524	Iron Poker, for arranging Fuel in Furnace, length 3 feet	...	...	0 2 6
907	1525	Bar Scraper, length 3 feet 6 inches	...	...	0 3 6
908	1526	Long Bar Scraper, Chisel form	...	...	0 4 0



1527



1528

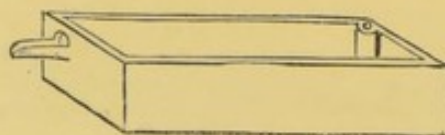


1529



1530

909	1527	Triangles, Iron Wire, to support Crucibles	...	...	£0 0 1
910	1528	" " covered with Pipe Clay	...	...	0 0 2
911	1529	" Malleable Iron, 3 inches	...	...	0 0 2
		5 "	...	...	0 0 3
912	1530	" Stout Iron, without Arms 5 "	...	...	0 0 5
		7½ "	...	...	0 0 8
		10 "	...	...	0 0 10



1531

913	1531	Trough, Porcelain, Cooler for Beer and Wine estimation, Length 14½ in., width 4¾ in., height 3¼ in.	£0 12 6
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Tripods. (See Stands.)

Tube, Glass. (See Glass Tube.)

Old
Cat.No.

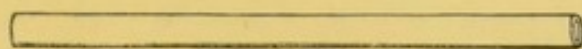
914 1532 **Tube**, Best Vulcanized Rubber, for Connections, Gas, &c.—

Diam. Internal	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{4}$ in.
Grey	—	2d.	3d.	4d.	5d.	7d.	9d.	1/3	1/6	2/	2/6	3/ per ft.
Red		2d.	2d.	3d.	4d.	5d.	7d.	10d.	1/4	1/9	2/3	2/6 3/6 ,,
Black		2d.	2d.	3d.	4d.	6d.	8d.	10d.	1/4	1/9	2/6 3/	3/6 ,,

The above prices are for the ordinary thickness of Tube used for Connections, Gas Burners, &c. ; if required thicker it will be charged accordingly.

915 1533 **Tube**, best Vulcanized Rubber, Red or Grey for Pressure—

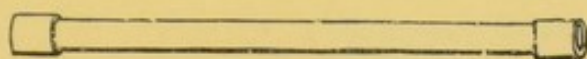
Diameter internal, $\frac{1}{8}$ th in.	External, $\frac{1}{2}$ in., per foot	...	£0	1	3
$\frac{3}{8}$ "	$\frac{3}{4}$ " "	...	0	2	3



1534

916 1534 **Tubes**, Berlin Porcelain, Glazed inside and out, for heating in a Furnace—

Length	12	20	20	20	20	26	26	26	26 in.
Dimensions	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{1}{2}$	$\frac{3}{4}$	$1\frac{1}{8}$	$1\frac{3}{4}$	2 in. external
	3/9	6/3	7/9	9/3	12/6	8/6	12/	16/	18/



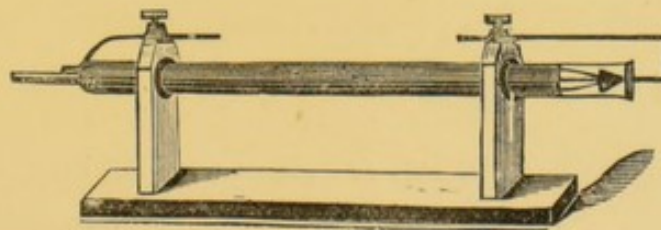
1535

917 1535 **Tubes**, Meissen or Dresden Porcelain, glazed inside, biscuit outside—

Length, 23 inches, diameter, external,	$\frac{5}{8}$ inch	£0	1	6
23 "	$\frac{7}{8}$ "	0	2	3
23 "	1 "	0	2	9
23 "	$1\frac{1}{8}$ "	0	4	0

918 1536 ,, German Glass, bent for Gas Leading, &c.

Various forms, $\frac{1}{4}$ inch diameter 0 0 3

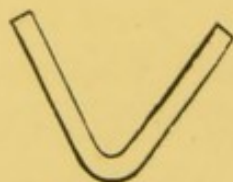


1538

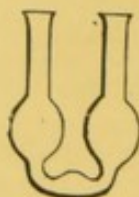
918A 1537 **Tube Ozone Induction**, covered with Tin Foil £0 6 0
 1538 ,, ,, on Stand, complete 0 10 6



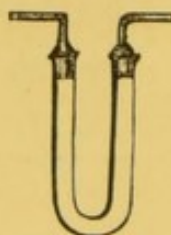
1539



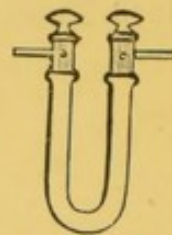
1540



1541



1542



1543

TUBES OF LIGHT BLOWN GLASS FOR ORGANIC ANALYSIS, &c.

Old
Cat.No.

919 920 1539 1540 Tubes, Chloride of Calcium, U Form 1539, or V Form 1540—

Length of Limb 3 4 5 6 8 10 12 in.

Diameter ... $\frac{3}{8}$ $\frac{1}{2}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{7}{8}$ 1 $1\frac{1}{8}$ in.

3d. 4d. 5d. 6d. 8d. 1/ 1/3

921 1541 Tubes, with Bulbs—

Length of Limb 4 5 6 7 8 10 in.

Diameter ... $\frac{1}{2}$ $\frac{5}{8}$ $\frac{5}{8}$ $\frac{3}{4}$ $\frac{7}{8}$ $\frac{7}{8}$ in.

8d. 9d. 1/ 1/3 1/6 1/9

921A 1542 Tubes, U Form, stoppered—

Length ... 3 4 5 6 8 in.

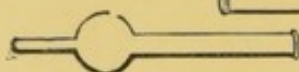
10d. 11d. 1/ 1/4 1/9 each

921B 1543 U Form, stoppered, with hole in stopper—

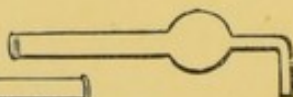
Length ... 3 4 5 6 8 in.

1/8 1/10 2/ 2/6 3/6 each

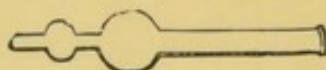
1544



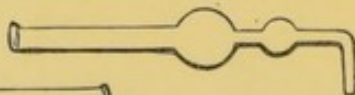
1546



1545



1547



922, 923 1544, 1545 Tube, Chloride of Calcium, for Drying Gases, &c.—

Length.	One Bulb (1544).	Two Bulbs (1545).
4 inches ...	each 2d., per doz. 1/3	each 2d., per doz. 1/8
6 .. ...	.. 2d., .. 1/9	.. 3d., .. 2/6
8 .. ...	.. 3d., .. 2/6	.. 5d., .. 3/

Old
Cat.No.

924, 925	1546, 1547	Tube, with Bend—		
	Length.	One Bulb (1546).	Two Bulbs (1547).	
	6 inches ...	... each 3d.	each 4d.	
	8 ,, ...	... ,, 4d.	,, 6d.	



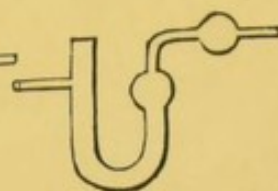
1548



1549



1550



1551

926 1548 Tube, Chloride of Calcium, Marchand's, with two Bulbs and Connecting Tube—

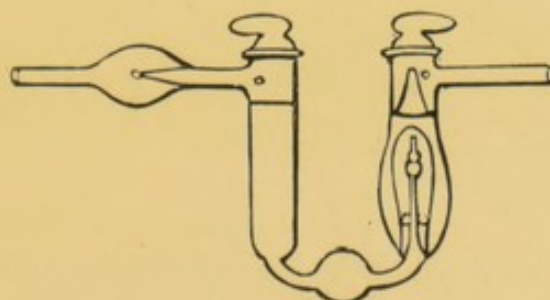
Length of Limb 4 inches ...	Diameter $\frac{1}{2}$ inch ...	each	£0 0 9
,, ,, 5 ,, ...	,, $\frac{5}{8}$,, ...	,,	0 0 10
,, ,, 6 ,, ...	,, $\frac{3}{4}$,, ...	,,	0 1 0

1549 ,, Chloride of Calcium, Marchand's, with tube passing into small bulb to prevent moisture sucking back—

$4 \times \frac{1}{2}$	$5 \times \frac{5}{8}$	$6 \times \frac{3}{4}$
9d.	10d.	1/ each

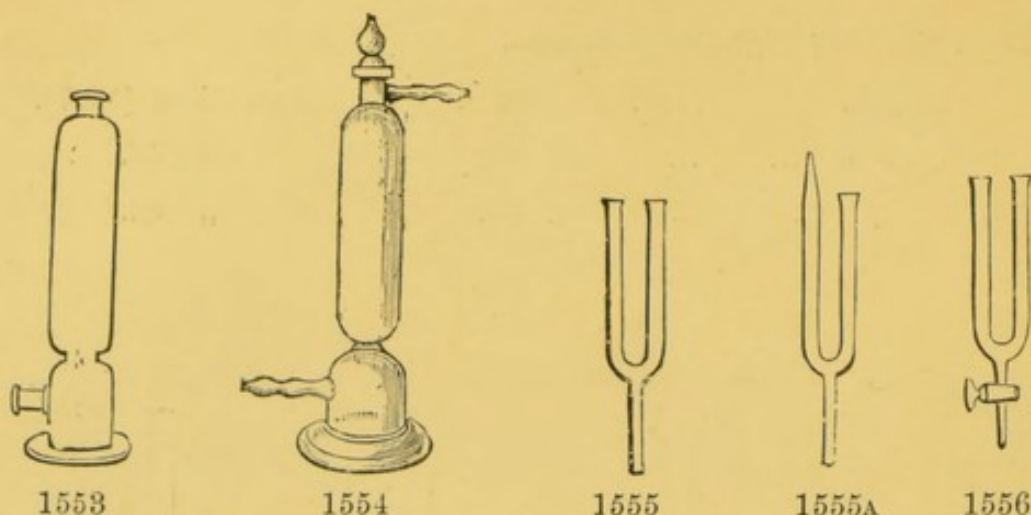
927 1550 ,, Marchand's Form, Modified by Vollhard ... each £0 1 0

928 1551 ,, ,, Fresenius ... ,, 0 1 0



1552

1685 1552 Chloride Calcium Tube, Schmitz, Limbs about 8 in. 0 5 0



Old
Cat.No.

929 1553 **Tube**, Cylindrical, with tubulure at side, for Drying Gases, &c.

Length	8	10	12	14	16 in.
Diameter	1½	2	2	2¼	2½ ..
	1/6	1/9	2/	2/6	3/ each

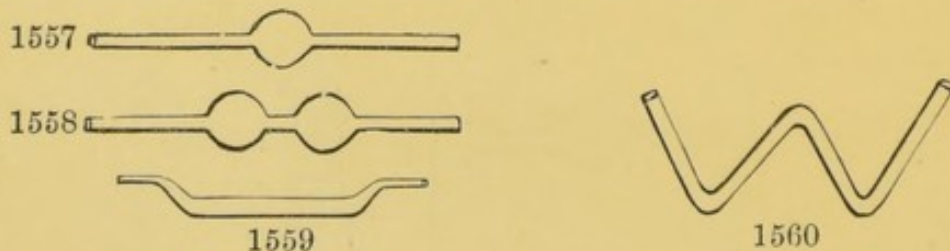
929A 1554 **Tube**, Cylindrical, Fresenius Improved, with extra tubulure at the Top, and Hole Drilled in Stopper—

Length	8	10	12	14	16 in.
Diameter	1½	2	2	2¼	2½ ..
	3/6	4/	4/6	5/	5/6 each

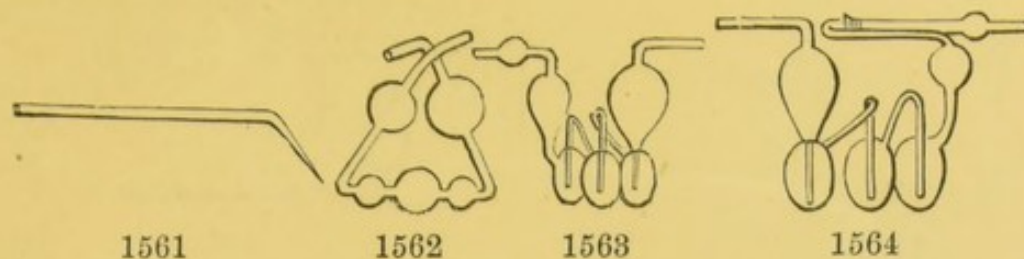
930A B 1555 1555A **Tubes**, Y Form, Plain—

Length and diam. of Limb	5 × ½	6 × ½	8 × ¾	10 × 7/8	12 × 1½
	1/	1/3	1/6	2/	2/6

931 1556 **Tubes**, Y Form, with Stopcock, 7 × 5/8 in. ... each £0 3 0



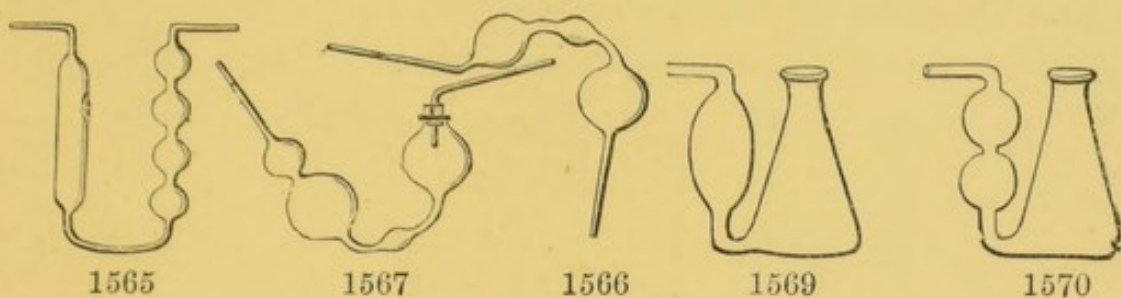
932	1557	Tube , Reduction, Hardest Combustion Glass, One Bulb, each	£0 0 6
933	1558	.. .. .. Two Bulbs ..	0 0 8
933A	1559	.. .. Hard Glass, 9 in....	0 0 9
934	1560	.. .. W Form, Length of Limbs, 5-in., Diam. 5/8 in.	0 1 6



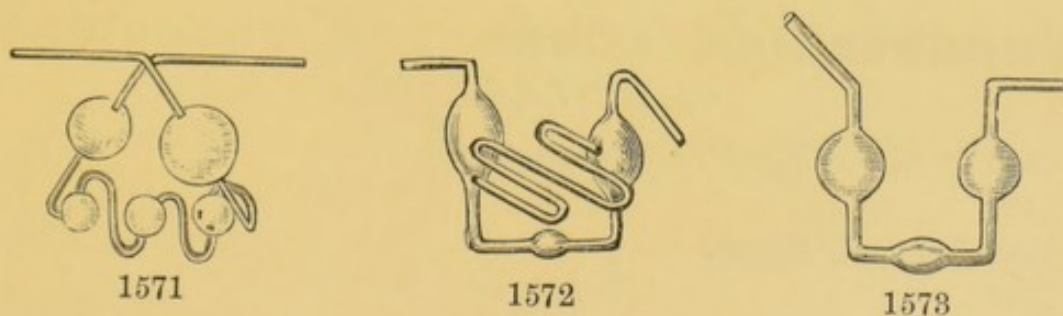
Old
Cat.No.

935 1561 **Tube, Combustion, Hardest Glass, Bent and Drawn for use,**
diam. $\frac{5}{8}$ in.; length 16 inches, each 7d.; 20 in., 10d.
Other sizes to order.

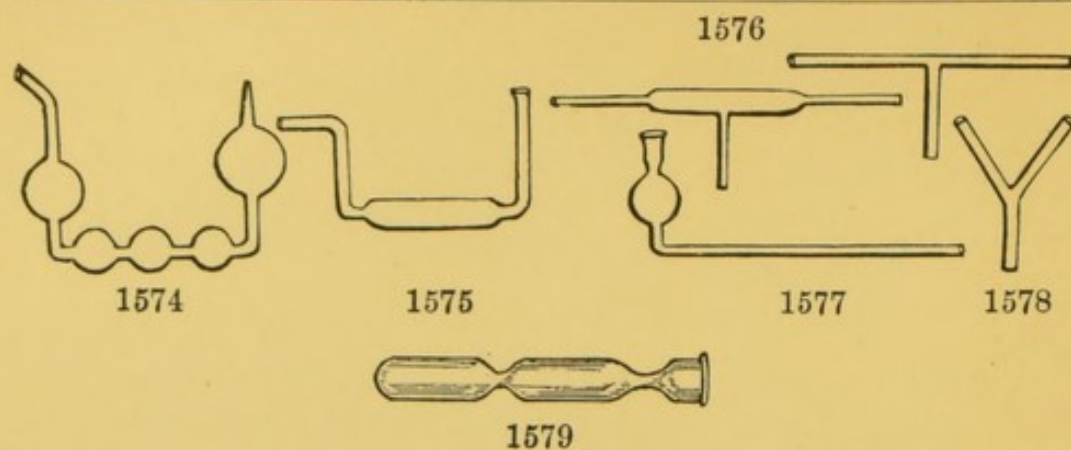
936	1562	Liebig's Potash Bulbs, in Case	...	...	...	...	£0	1	3
937	1563	Geisslers & Mohr's	„	„	...	...	0	2	0
938	1564	„	with Chloride of Calcium Tube attached,						
			ground to tube	...	...	...	0	3	0



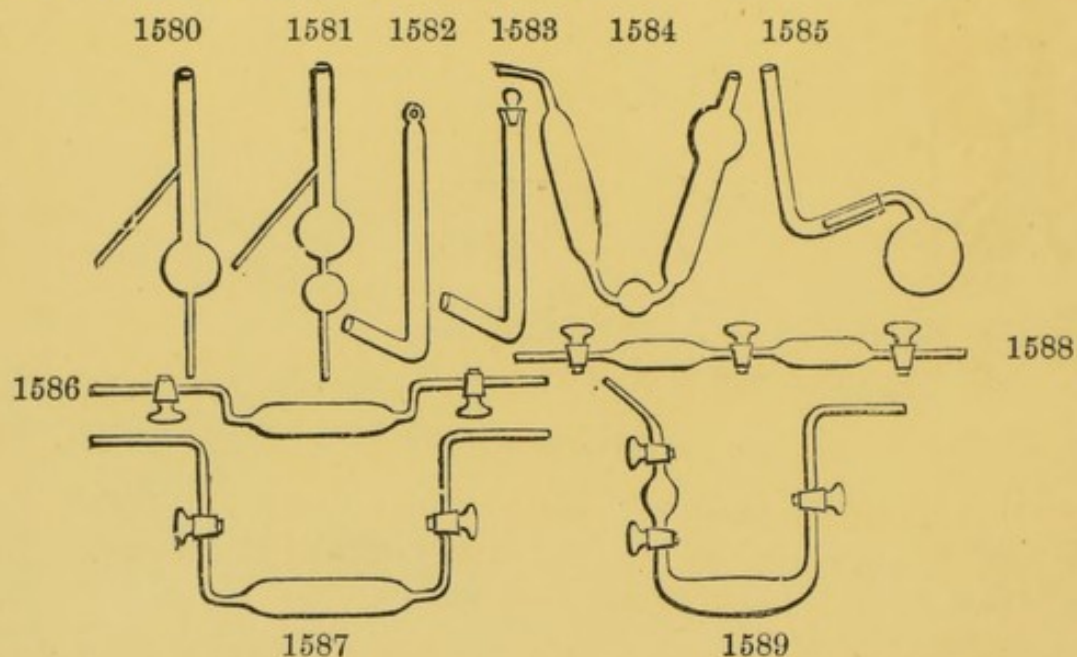
939	1565	Mitcherlich's Potash Bulbs	...	...	...	...	£0	1	3
940	1566	Nitrogen, Will & Varrentrap's Potash Bulbs	...				0	0	8
940A	1567	„	Shepherd's, with bent Tube and Cork				0	0	10
	1568	„	„	„	Stopper		0	1	0
941	1569	„	„	1 Bulb modified by Vollhard			0	1	0
942	1570	„	„	2 Bulbs	„	„	0	1	0



1682	1571	Liebig's Potash Apparatus, new form	...	...	...	£0	1	6
1683	1572	Schloesing's	„	„	...	0	1	6
1684	1573	Will & Varrentrap's ditto, French form	...	...	...	0	0	9

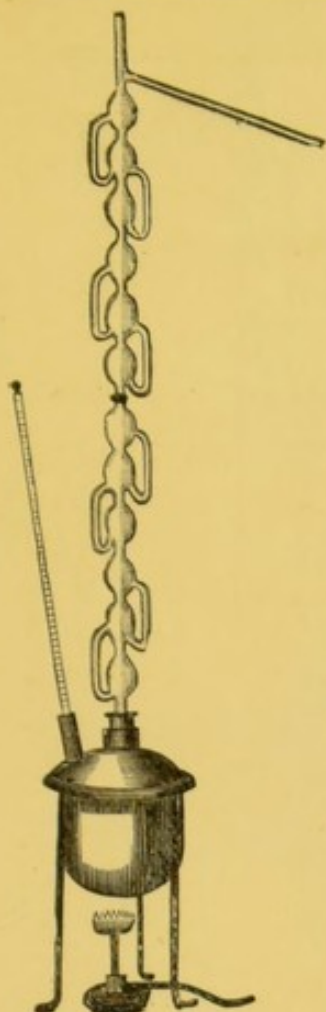


Old Cat.No.							
943	1574	Ure's 5 Bulbs	...	...	...	each, 2/ and	£0 3 6
944	1575	Liebig's Drying Tube	...	...	...	...	0 0 8
945	1576	Three-Limb Tubes	...	...	...	each, 6d. and	0 0 9
946	1577	Suction Tube	...	...	...	...	0 0 3
947	1578	Three-way Tubes, Y or T form	...	...	each 3d., 4d., and	...	0 0 6
947A	1579	Tubes for Sulphur Estimation	...	...	...	...	0 0 6

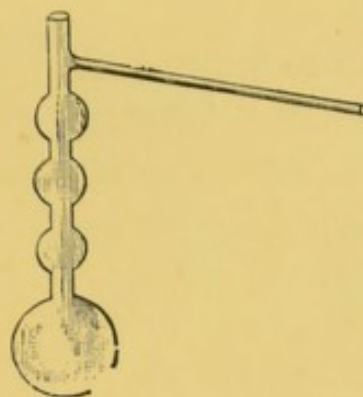


CONDENSATION TUBES FOR FRACTIONAL DISTILLATION.

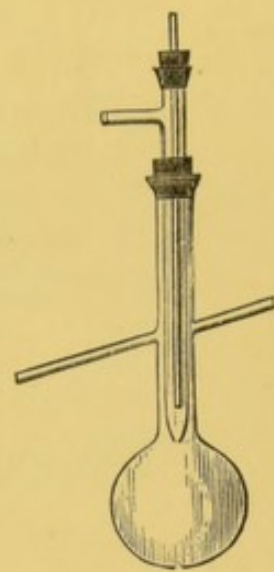
948	1580	Tube, Condensation, Fractional, with 1 Bulb	...	...	...	...	£0 0 9
949	1581	" " " 2 Bulbs	...	...	1/ and	...	0 1 6
950	1582	Cooper's Receiver, Plain	...	...	...	...	0 0 8
951	1583	" " Stoppered	...	...	...	...	0 1 0
952	1584	Kerr's Gas Tube	...	...	...	...	0 1 3
953	1585	Clark's Retort and Condenser	...	...	...	...	0 0 9
954, 955	1586, 1587	Gas Condensation Tubes, with two Stopcocks for Cyanogen, &c.	...	...	...	...	0 5 6
956, 957	1588, 1589	" " with three ditto ditto	...	...	...	...	0 7 6



1590



1593



1594

Old
Cat.No.

1686 1590 Benzole Testing Apparatus, Copper vessel about 1 quart capacity, with fractional Tube, 12 Bulbs, Thermometer Stand and Burner complete £2 10 0

1687 1591 Thermometers for Benzole Testing, enamelled back, graduated on stem, 70 to 130° Fahr., in $\frac{1}{3}$ th, with small bulb, length 15 in. 0 12 6

1688 1592 Thermometers filled with Nitrogen to prevent the Mercury from separating at high temperatures, enamelled back, graduated on stem—

Single degrees 0 to 360 or 400° 8/ 100 to 360° or 400 c. 8/6
100 to 360° or 400 c. $\frac{1}{2}$ degrees 10/

1689 1593 Ladenberg's Fractional Distillation Flask, with 3 & 4 Bulbs—

4	6	8	12	18	35 oz.
1/	1/3	1/6	2/	2/6	3/ each

1690 1594 Kreusler's Ditto ditto with inner tube—

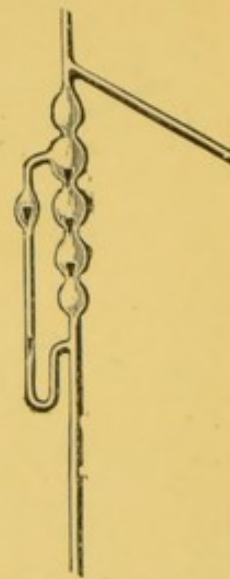
4	8	16	24	36 oz.
6d.	2/	2/6	3/	4/ each



1595



1596



1597

Old
Cat.No.

958 1595 Spiral Worm Condenser, in Tube, complete—

Outer Tube ...	6 × 1	8 × 2	9 × 2½	10 × 3 in.
	2/	2/6	3/	4/

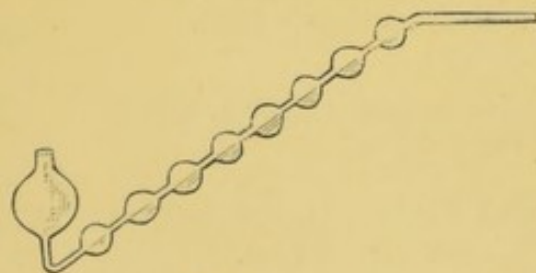
958A 1596 Fractional Distillation Tubes, Le Bel Henninger, for Benzole determinations—

2	3	4	5	6 bulbs
2/	3/	4/6	6/	8/ each

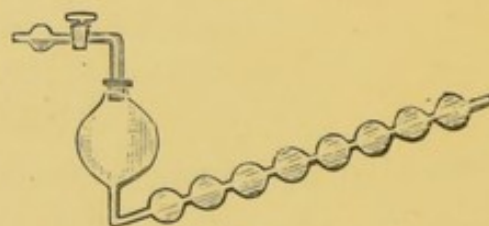
958B 1597 Fractional Distillation Tubes, Glyusky's, 5 bulbs with three Glass Balls inside—the Platinum Gauze Cones used in the Bell Henninger's Tubes not being required.

Small	Medium	Large
4/	4/6	5/ each

1598 Fractional Distillation Apparatus, Lothar Meyer's, under diminished pressure, Tube ground into end of Cylinder £0 10 0



1599



1600

1691 1599 Mayer's Apparatus, for estimation of Sulphur in Iron
by Bromine Water £0 5 0

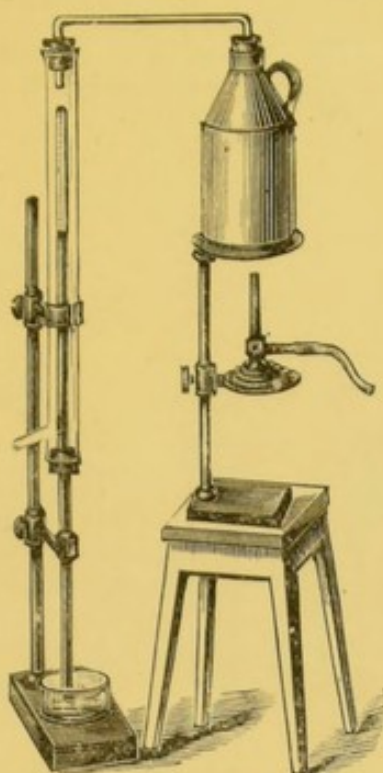
1692 1600 ,, ,, with stopcock 0 8 0



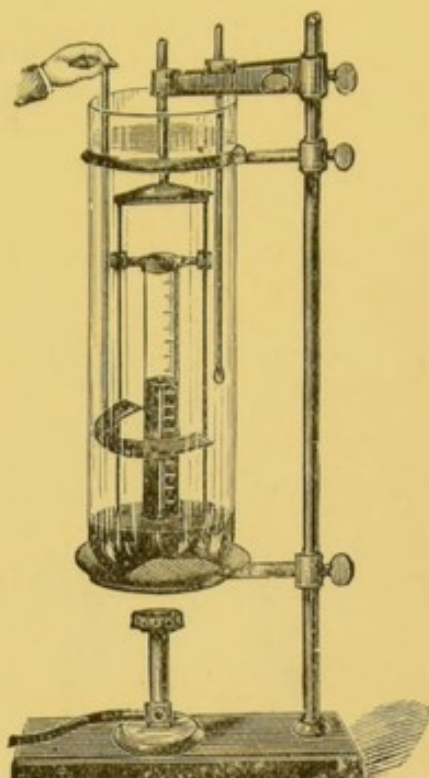
1601



1602



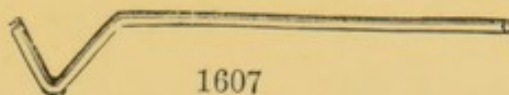
1604 & 1605



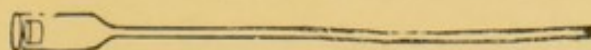
1606

Old
Cat.No.

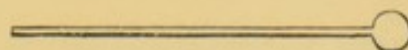
959	1601	Vapour Density Bulb, Dumas	... ..	£0 0 8
959A	1602	Apparatus (Victor Meyer)...	...	0 5 0
	1603	Tubes, Stopped, small, for use with above per doz.		0 6 0
959B	1604	Density Bulb, Hofmann's, Glass part only	...	0 10 0
	1605	Complete with Wood Stand, 2 Iron Stands with Clamps, Bunsen's Burner, Glass Dish and Tin Can	... ..	1 10 0
959c	1606	Gay Lussac's, Complete with Stand and Clamps, Thermometer, Bunsen's Burner, &c.	... ..	2 0 0



1607



1608



1609

960	1607	Tube, Combustion, Hard Glass, Closed and Bent	...	£0 0 9
961	1608	Diffusion, length, 24 inches	... ..	0 0 9

Old
Cat.No.

962 1609 Tube, Capillary—

Length	18	18	18	18	18 in.
Diameter of bulb 1	1	1½	2	2½	3 in.
	6d.	8d.	10d.	1/	1/3



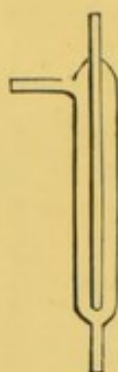
1610



1612



1613



1614



1615



1617

963 1610 Tubes, Bulb (Bulb Tubes)—

½	1	1½	ozs. capacity
1/3	1/6	2/	2/6 per doz.

964 1611 Acid Floats per doz. £0 6 0

965 1612 Berzelius' Wash Bottle Tube each 0 0 6

966 1613 Bunsen's Filter Pump Tube ,, 0 2 6

967 1614 ,, ,, ,, ,, 0 2 6

968 1615 ,, ,, ,, Syphon Form ,, 0 2 0

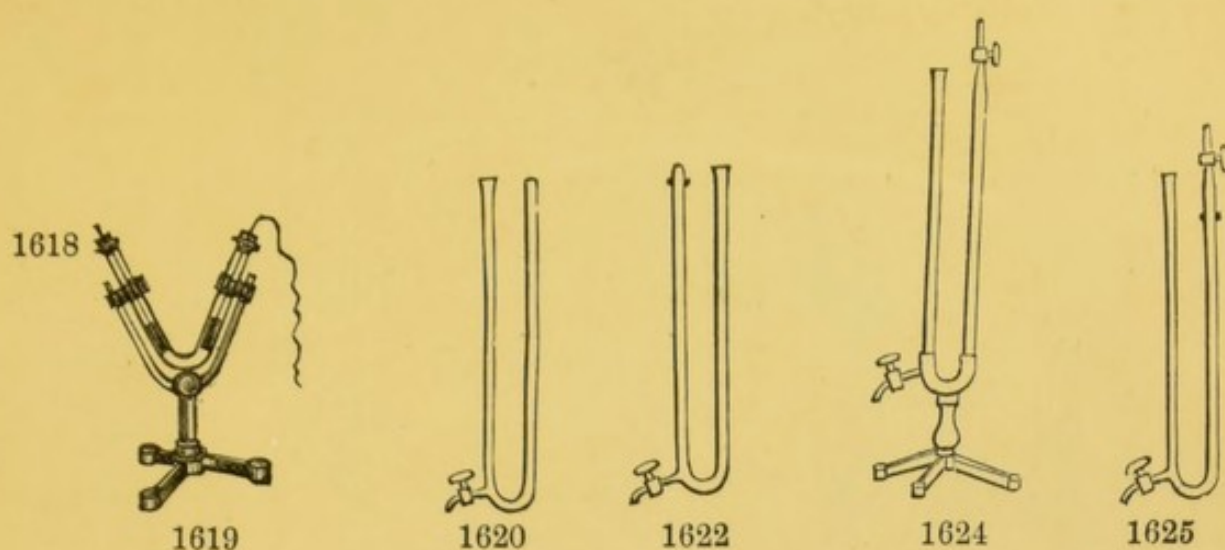
,, ,, ,, Set of three ,, 0 6 0

969 1616 Vaccine Tubes, in Tube per bundle 0 1 0

970 1617 Valinches, Glass, Bulb and Cylindrical, Capacity ½ pint each 0 1 0

,, ,, ,, 1 ,, 0 1 6

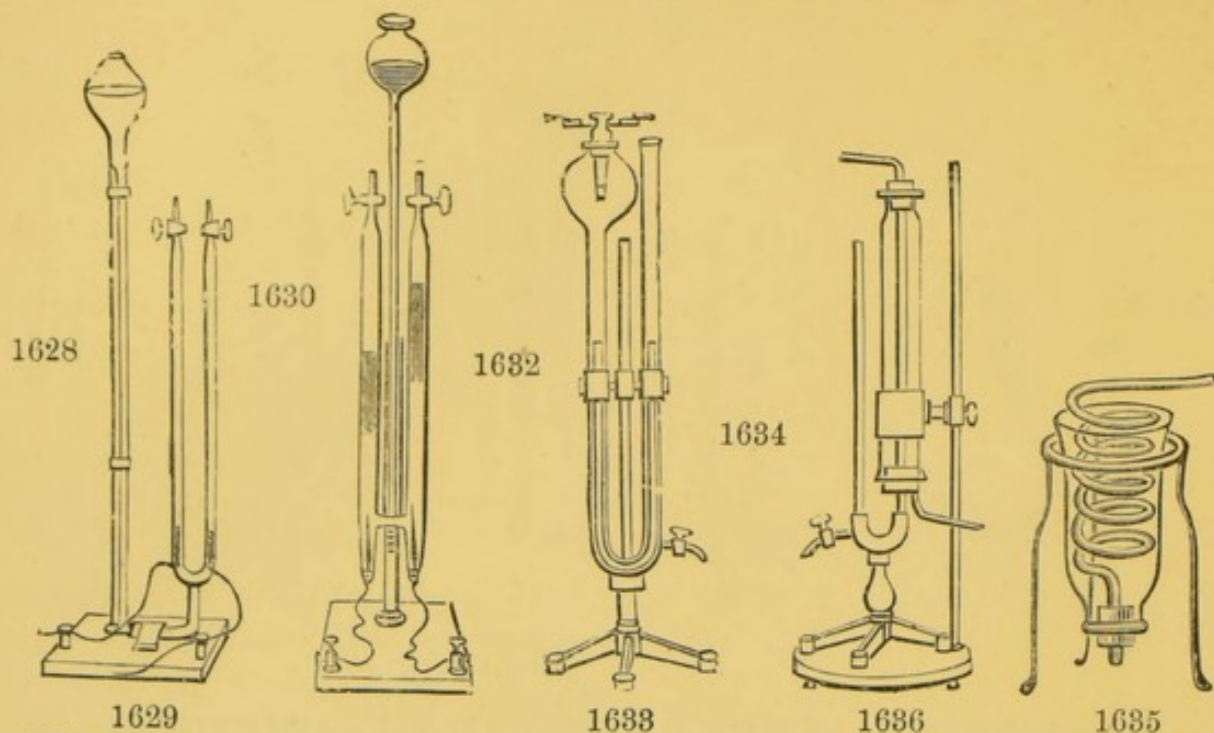
,, ,, ,, 2 ,, 0 2 0



HOFMANN'S APPARATUS FOR DECOMPOSITION AND VOLUMETRIC ANALYSIS.

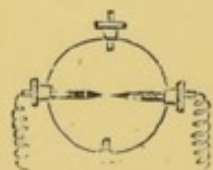
Old
Cat.No.

971	1618	V form, with two Platinum Electrodes for the Electrolysis of Hydrochloric Acid, Water, and Ammonia	...	...	£0	5	0
972	1619	Iron Tripod Stand, with Brass Mounts	...	...	0	5	0
973	1620	U form, with one Stopcock, for decomposition of Hydrochloric Acid by Sodium	...	...	0	5	0
974	1621	U form, with Pinchcock instead of Stopcock	...	...	0	4	0
975	1622	U form, with one Stopcock and Platinum Electrodes, to ascertain the quantity of Hydrogen contained in one volume of Hydrochloric Acid	...	...	0	6	0
975A	1623	U form, „ „ graduated 50 c.c.	...	...	0	8	6
976	1624	U form, with two Stopcocks	...	...	0	6	0
977	1625	U form, with two Stopcocks and Platinum Electrodes	...	...	0	7	6
978	1626	U form, with two Stopcocks and Platinum Electrodes, and graduated into c.c.	...	...	0	11	6
979	1627	Iron Tripod Stand, with brass mounts for either of the above	...	...	0	7	6



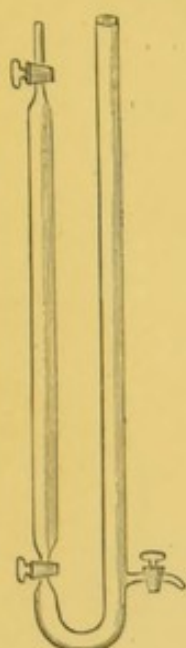
Old
Cat.No.

980	1628	Tube for decomposition of Water into one of Oxygen and two of Hydrogen with two Stopcocks and Platinum Electrodes, and Bulb-Reservoir	...	...	...	£0 12 0
981	1629	Iron Stand for ditto, with brass fittings	...	...	...	0 7 6
982	1630	„ for Electrolysis of Hydrochloric Acid with Carbon Electrodes	...	...	...	0 10 0
983	1631	Iron Tripod Stand, with Brass Mounts	...	...	...	0 7 6
984	1632	„ for Electrolysis of Carbonic Acid and Sulphurous Acid, with one Stopcock and Platinum Electrodes	...	...	...	0 12 6
985	1633	Iron Tripod Stand, with Brass Mounts	...	...	...	0 7 6
986	1634	„ U form, with Stopcock, Platinum Electrodes and Jacket, for decomposition of steam	...	...	...	0 8 0
987	1635	Glass Worm Condenser and Stand	...	...	...	0 4 0
988	1636	Iron Tripod, with Rod and Clamp and Brass Mounts	...	...	...	0 12 6



1637

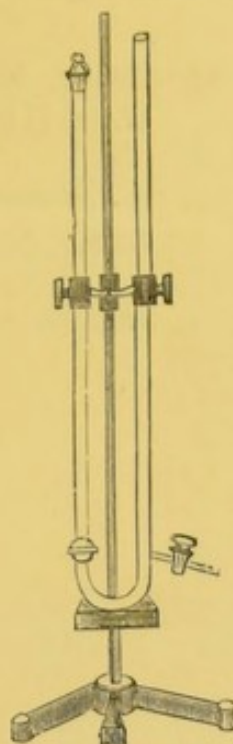
989	1637	Bulb, with four necks for Acetyline from Hydrogen and Carbon, 16 ounces capacity, with Carbon Electrodes	0 5 0
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1638



1640



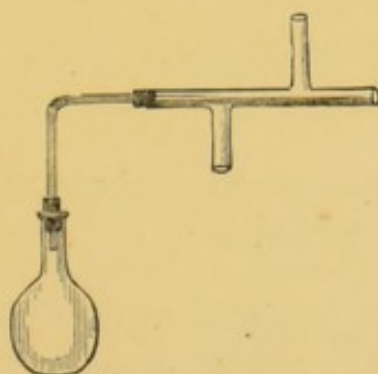
1641



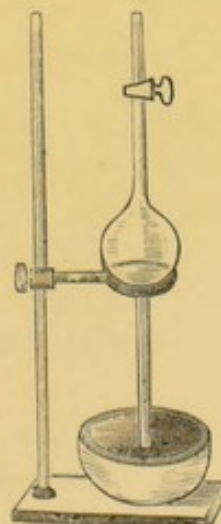
1643

Old
Cat.No.

1693	1638	Hofmann's Apparatus, to determine the quantity of Elementary Gases contained in one volume Hydrochloric Acid, with 3 stopcocks	...	£0 15 0
1694	1639	Stand for ditto with brass mounts	...	0 7 6
1695	1640	„ „ to show that mixture of Hydrogen and Chlorine in Hydrochloric Acid no condensation takes place	... ..	0 5 0
1696	1641	„ „ for Volumetric Decomposition of Ammonia by Chlorine and Hypobromide Sodium, with 2 stopcocks	... ..	0 14 0
1697	1642	Stand for ditto	... ..	0 7 6
1698	1643	„ „ to illustrate increase of weight by combustion	... ..	0 6 0



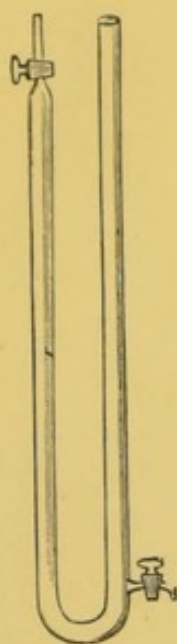
1644



1645

Old
Cat.No.

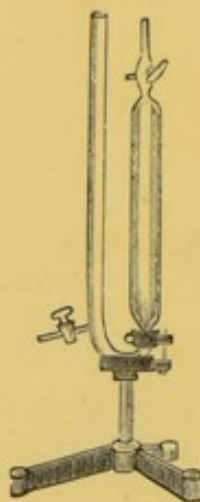
1699	1644	Hofmann's Apparatus, to illustrate that Steam from Water is lighter than Air	... ..	£0 3 0
1700	1645	„ „ to ascertain relations of Water and Steam, Glass Bulb, with Stopcock	... ..	0 4 0
1701	1646	„ „ complete with Stand	... ..	0 7 6



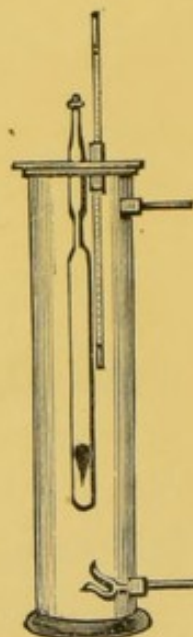
1647



1648

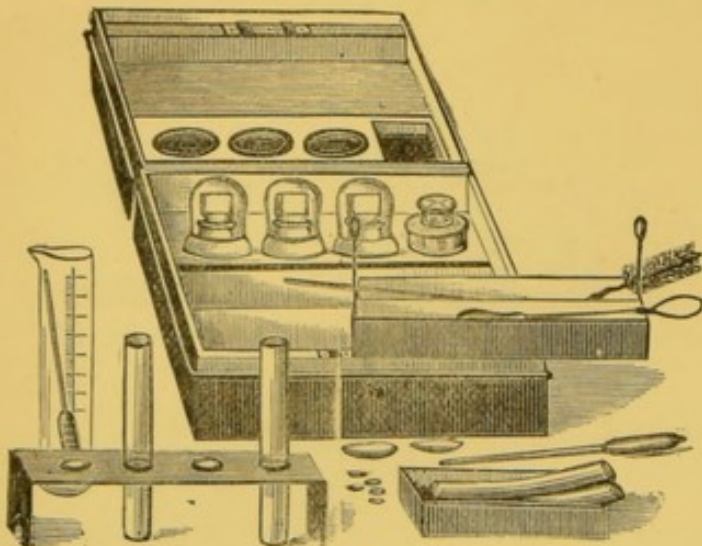


1649



1650

1702	1647	Hofmann's Apparatus to illustrate the Electrolysis and Synthesis of Water, with two Stopcocks and Platinum Electrodes, graduated into c.c.	... ..	£0 11 6
		Stand for ditto	... ..	0 7 6
1703	1648	„ „ to illustrate the combustion of one Gas in another	... ..	0 3 6
1704	1649	„ „ to illustrate the manufacture of Sulphuric Acid, with two Stopcocks	... ..	0 9 0
		Stand for ditto	... .. extra	0 7 6
1705	1650	„ „ to illustrate the greatest density of Water	... ..	0 12 0

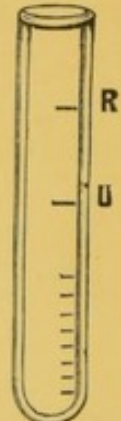


Old
Cat.No.

1657



1658



1659

992B 1657 **Urinometer**, set of Apparatus for travelling. In stout japanned tin case, with lock and key, and moveable tray. Dimensions, 8 in. x 6 in. x 3¼ in. high. Consisting of 3 Capped and Stopped Bottles, about 1½ oz. capacity, accurately ground; Brass Spirit Lamp with screw top; portable japanned tin Test Tube Holder; Urinometer in case, with graduated Immersion Tube; 6 Test Tubes; Test Tube Holder; Test Tube Brush; Pipette; 6 Watch Glasses; Glass Stirring Rod; 4 Books Test Paper in japanned tin box; Microscopic Slides and Circles, and Thermometer graduated on stem. Price, complete

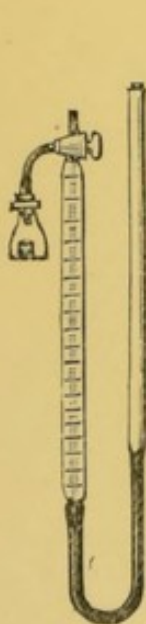
£1 10 0

992c 1658 **Urinometer Test Tube**, thin for heating, graduated to 15 c.c. in single divisions, as recommended by Dr. Veale, for detection of Albumen. (See "British Medical Journal" May 10th, 1884.)

0 1 0

992D 1659 **Urinometer Test Tube**, stout, graduated, as recommended by Esbach, in 7 divisions, representing grammes per litre of Albumen

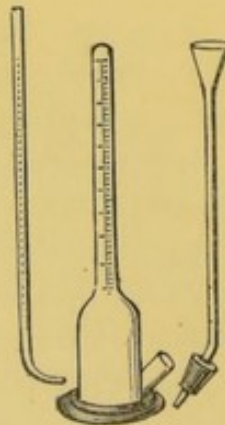
0 2 6



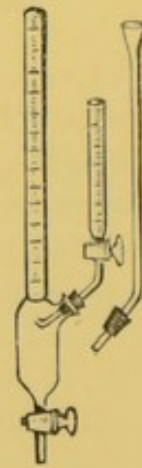
1660



1661



1662

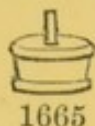


1663

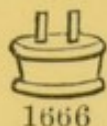


1664

Old Cat.No.						
1714	1660	Doremus' Ureometer,	for estimation of Urine by			
			Hypobromide Sodium ...	...	£0 9 0	
1715	1661	„ „	modified by Lunge ...	...	0 10 0	
1716	1662	Greene's	for estimation of Nitrogen by			
			Hypobromide Sodium ...	...	0 7 6	
1717	1663	Anderlini's	ditto	...	0 12 0	
1718	1664	Yoon's Urinometer	...	...	0 8 0	



1665



1666



1667

Vulcanized Rubber or Caoutchouc Caps, for Bottles and Gas Jars—

			$\frac{3}{4}$	1	$1\frac{1}{4}$	$1\frac{3}{8}$	$1\frac{1}{2}$	$1\frac{3}{4}$	2 ins., width of Cap	
993	1665	1 neck	4d.	5d.	5d.	6d.	6d.	7d.	7d. each	
994	1666	2 necks	5d.	5d.	5d.	6d.	6d.	7d.	9d. „	
995	1667	3 „	...	...	6d.	6d.	7d.	9d.	10d. „
996	1668	Vulcanized Rubber or Caoutchouc Sheet, about 9 in. wide,							per ounce	£0 0 10



1669



1670



1671



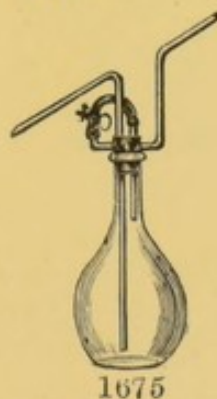
1672



1673



1674



1675

WASHING FLASKS.

Or Water Bottles for Washing Precipitates.

997	1669	Washing Flask, Gmelin's, fitted with bent Tubes and Cork, complete—				
		Capacity	16	20	32	40 ozs.
			$\frac{1}{6}$	$\frac{1}{8}$	$\frac{1}{10}$	2/ each

Fitted with India Rubber Stoppers 6d. each extra.

Old
Cat.No.

997A 1670 Gmelin's Washing Bottle, with India Rubber blowing Ball—

Capacity of Flask	16	24	32	48 ozs.
	3/	3/2	3/4	3/6 each

997B 1671 India Rubber Blowing Balls, each £0 1 6

998 1672 Washing Flask, Berzelius, 20 oz. capacity, fitted with bent Tubes and Cork, complete 0 1 6

,, 32 oz. ,, ,, 0 1 9

,, 48 ,, ,, ,, 0 2 0

998A 1673 ,, ,, fitted with Wood handle, for boiling water—

20 30 ozs.

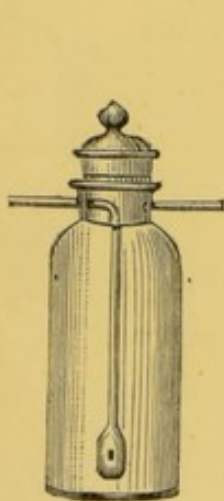
2/ 3/6 each

998B 1674 Washing Flask, arranged to prevent the fumes from entering the mouth—

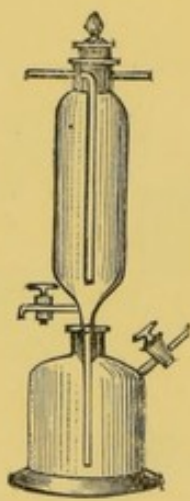
20 30 40 ozs.

3/6 4/ 4/6 each

998C 1675 ,, ,, 3/6 4/ 4/6 ,,



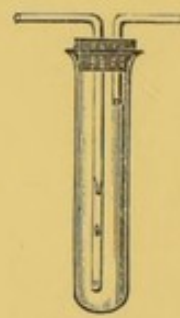
1676



1677



1678



1679

1676 Washing Bottle, Gas, or Absorption Apparatus, with two Tubes, fused into neck of Bottle; upper part of Stopper can be removed for examination of contents without disarranging the connections—

Capacity 8 16 32 ozs.

4/ 4/6 5/ each

1677 Washing Bottle, Gas, or Absorption Apparatus, upper Cylinder with Stopcock, Gas leading Tubes fused into neck and ground into neck of lower Chamber; the Cylinder can be filled with Pumice or pieces of Glass, and the liquid driven by pressure out of lower Vessel into upper Cylinder £0 10 0

Old
Cat.No.

1678 **Washing Bottle, Gas, or Absorption Flask**, with India Rubber Stopper and Valve to prevent the rising of liquid, used instead of Muencke's Flask ... £0 3 0

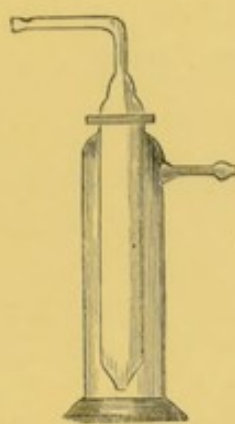
1679 **Washing Bottle, Gas, or Absorption Tube**, Dr. Wilfarth's, fitted with India Rubber Stopper and Tubes with Valve 0 2 6



1680



1681



1682



1683



1684

1719 1680 **Allihn's Gas Washing Flask**, improved form, double action, with Valve which being pressed down by the gas closes the inner tube preventing the gas passing directly through the tube, as soon as the pressure ceases the valve rises and the liquid communicates—

Capacity	8	16	32 ozs.
	4/	4/6	5/ each

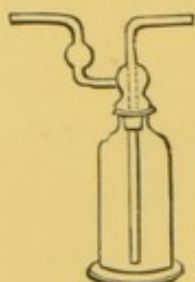
1720 1681 **Kieldhal's Gas Washing Apparatus** £0 4 0

1721 1682 **Habermann's ditto**, about 250 c.c. capacity 0 3 0

1722 1683 **Cloez'** ditto, about 100 ,, ,, 0 1 6

1723 1684 **Washing Flask with Tubes ground into neck**—

	250	500	1000 c.c.
	3/	3/6	4/



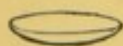
1685



1686

Old
Cat.No.

1013	1685	Washing Bottle, for Gas, "Drechsel's," with Inlet and Outlet, Tube on Stopper, accurately Ground in, Capacity 20 ozs.	£0	3	0
1013A	1686	Washing Bottle, Dr. Muencke's improved	0	3	6



1687



1688



1689

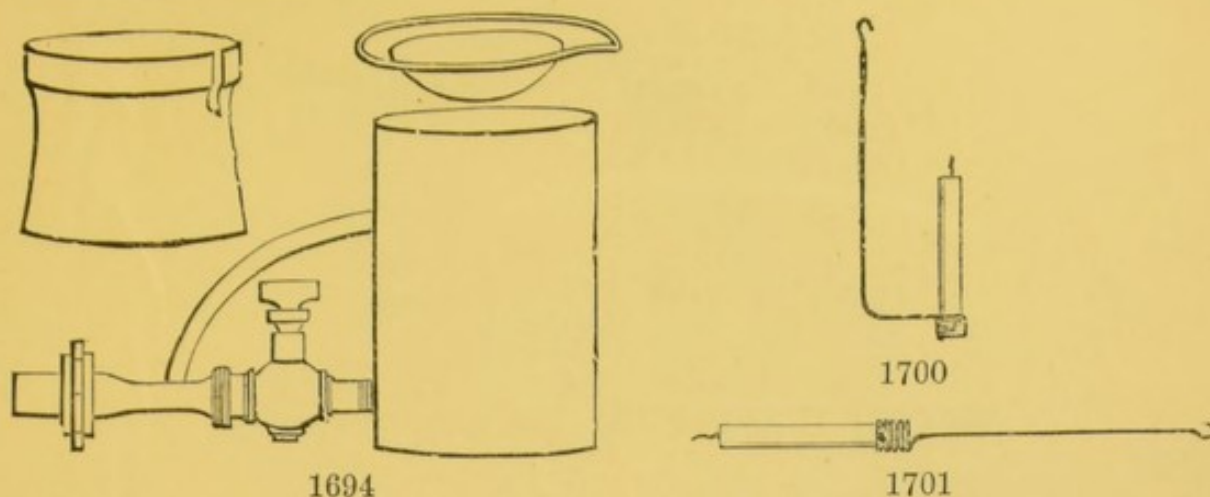


1690

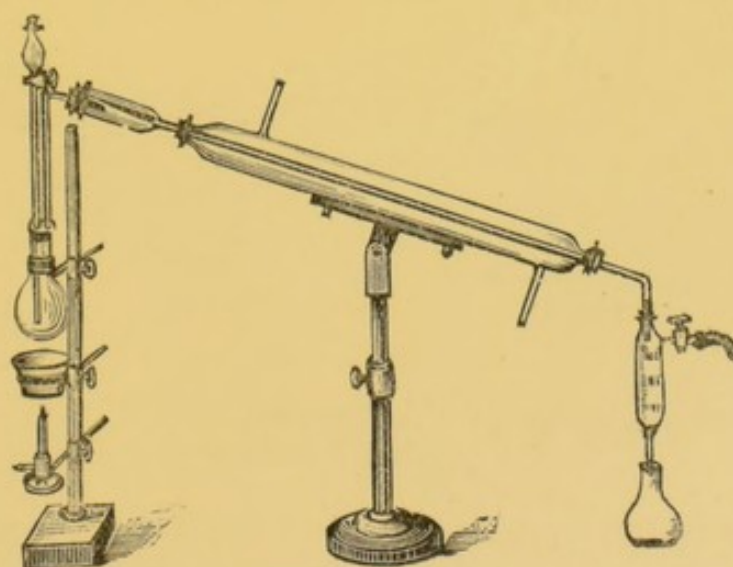
999	1687	Watch Glasses, thin White Bohemian Glass, with ground Edge—													
			1½	1¾	2	2¼	2½	3	3½	4	4½	5	6	7	8 in. diameter
			8d.	9d.	1/	1/6	2/	2/6	3/	4/6	7/	8/6	9/	10/	14/ per dozen
1000	1688	Watch Glass Holder, for the hand, brass wire in Wood Handle	£0	0	6										
1001	1689	Watch Glasses, Ground to fit accurately, with Binders for Weighing Filters, &c., complete, 2 in. diam., per pair	0	1	0										
		" " 2½ " "	0	1	6										
1001A	1690	Watch Glasses Clip, Stout Brass Wire each	0	0	3										

WATER ANALYSIS.

1002	1691	Water Analysis Apparatus, Bischof's	1	1	0
1003	1692	" " " " Glass part only	0	5	0
1004	1693	Frankland's Water Analysis Apparatus, complete	10	10	0



	Old Cat.No.						
1005	1694	Frankland's Copper Support, Basin and Water Bath with Stopcock	... ..	..	£1	2	6
1006	1695	Wanklyn's Apparatus for Analysis of Water, Tea, Coffee, and Milk. (See Special List.)					
		Water Baths. (See Drying Apparatus.)					
		Weights. (See Balances and Weights and Becker's Special List.)					
1007	1696	Wire Gauze, Iron, fine, Squares 4 × 4 inches	... each		0	0	3
		" " " " 6 × 6 "	" " "		0	0	4
		" " " " 12 × 9 "	per foot		0	0	9
		" " " " 12 × 12 "	" "		0	1	0
1008	1697	" " Coarse, in Squares 6 × 6 inches, each			0	0	4
		" " " " 12 × 12 "	per foot		0	0	10
	1698	" " Stout Brass " 6 × 6 "	each		0	0	8
1009	1699	" " Copper, fine, for Combustion Tube, 12 × 12, per foot			0	2	0
1009A & B	1700 & 1701	Wire Gauze Taper Holder, with Taper, either form	... ..	each	0	0	6
1594	1702	Nickel Gauze, medium mesh	... ..	per oz.	0	1	6



1703

1724	1703	Wolf's Apparatus to estimate Acetic Acid in Wine, glass parts only	£0	18	0
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1704



1705



1706

WOULFFE'S BOTTLES.

Old
Cat.No.

1010, 1011 1704 1705 Woulffe's Bottles, Bohemian Glass, with welted necks—

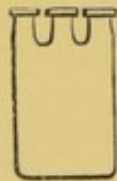
Capacity	4	8	12	16	20	24	32	ozs.
2 necks	8d.	11d.	1/2	1/3	1/4	1/6	1/9	each
3 necks	9d.	1/2	1/3	1/4	1/6	1/9	2/	each
Capacity	48	64	100	130	160	220	300	ozs.
2 necks	2/3	2/6	4/	5/	6/	8/	10/	each
3 necks	2/6	3/	4/6	5/6	7/	9/6	12/	each

1012 1706 Woulffe's Bottles, with 3 necks, Stoppered, with Inlet and Outlet;
Tube accurately ground to fit—

6	8	12	16	20	24	32	48	64	80	100	ozs. capacity
2/6	3/	3/3	3/6	3/9	4/	4/6	5/	6/6	7/6	8/6	each



1707



1708



1709

1014 1707 Woulffe's Bottles, Light Bohemian Glass, with 2 or 3 necks

Capacity	2 ounces	...	...	...	£0	0	10
„	4	„	...	...	0	1	3

1015 1708

„

Bohemian Glass, with Round Bottoms,
thin, for boiling—Capacity 45 ounces, 2 necks

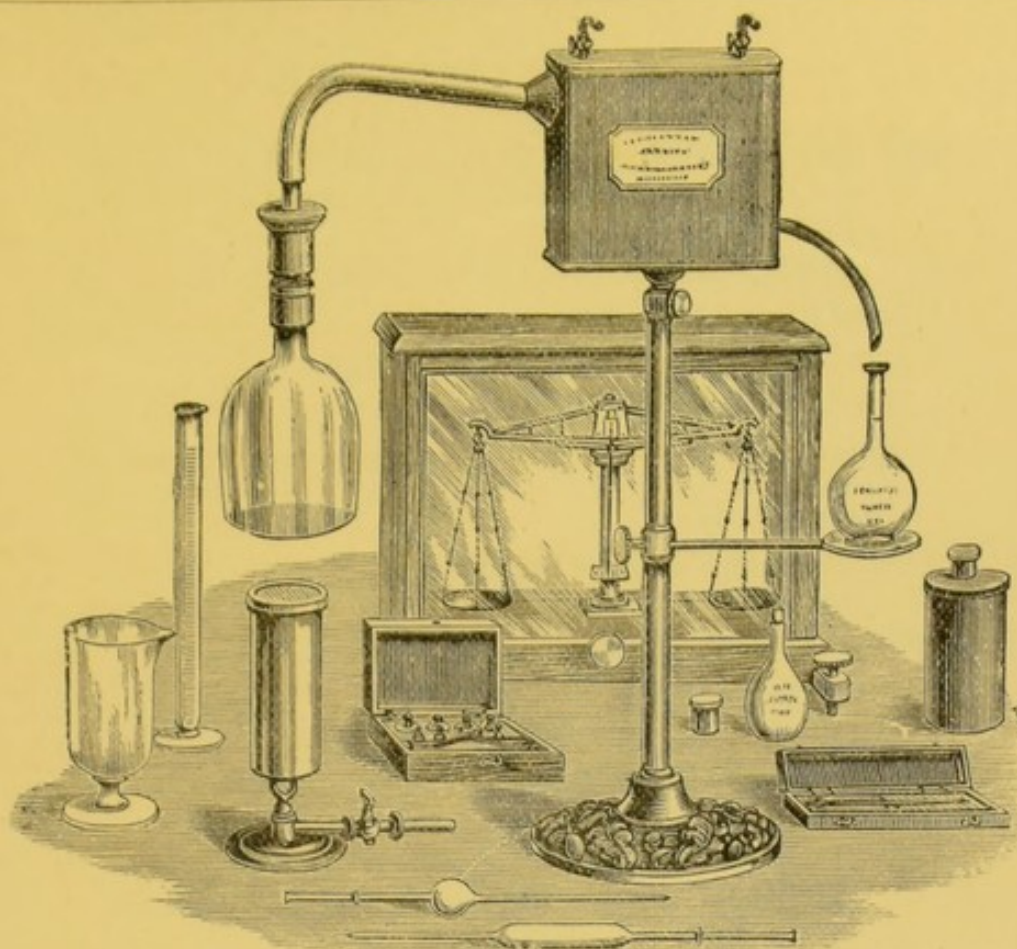
0 3 0

1016 1709

„

„

64 3 „ 0 4 6



1710

THE REVENUE STANDARD STILL.

For ascertaining the Strength of Wines, Liqueurs, and Original Gravities of Beer.

As supplied to the Laboratories of Her Majesty's Boards of Inland Revenue and Customs, and the principal Brewers and Wine Merchants in the United Kingdom, Colonies, &c.

THE BEER SET.

The Apparatus required for conducting the process described in the directions for determining the Original gravities of Beers, have been arranged by TOWNSON & MERCER, with the approval of the Principal of the Inland Revenue Laboratory, Somerset House, and consist of the undermentioned:—

The Revenue Standard Still and Distilling Flask	£4 4 0	1 each Graduated Measure, 500 & 1,000 grains, divided into 100 divisions ..	£0 4 0
6 Distilling Flasks, with screws to fit on Still at 2/6	0 15 0	Specific Gravity Bottle, 1,000 grains, accurate to 1/50th of a grain, with Counterpoise in case	0 15 0
1 doz. Elastic Washers	0 1 6	Box of Test Papers, assorted	0 1 6
6 Receivers marked in neck at 1,600 grains at 1/3	0 7 6	Specific Gravity Thermometer, Ivory Scale, with bare bulb in leather case	0 7 6
Argand Gas or Copper Spirit Lamp, with Sliding Rod	0 10 6	Pint bottle of Test Ammonia	0 2 6
6 Cylindrical Test Glasses at 1/	0 6 0	12 ft. Vulcanized Rubber Tube, at 5d.	0 5 0
1 " Pipette	0 0 6	Book of Directions, with Tables of original gravities	0 1 6
1 Bulb	0 0 4	2 Glass Saccharometer graduated with single degrees for taking the Specific Gravity of Beers, 1,040 to 1,080, and 1,080 to 1,125 at 2/6	0 5 0
Chemical Balance in Glass Case, with arrangement for steadying Scale Pans	7 10 0	1 Immersion Tube	0 1 2
Box Chemical Weights, 1,000 grains to 1/100th	1 15 0		

Complete Set, packed in strong Cases, £18.

THE WINE SET.

Old
Cat.No.

1436 1711	The Revenue Standard Still consists of the Condenser on a Telescope Stand, with the Bracket and the Still Flask, price	... ..	£4 4 0
	6 extra Still Flasks, with Screws to fit the Still, each	... ..	0 2 6
	1 dozen Elastic Washers	... ..	0 1 6
	2 Standard Measure Glasses, gauged, each	... ..	0 1 6
	1 Pipette or Dropping Tube	... ..	0 0 6
	1 Water Bottle with Tubes, to allow a small stream of water for washing, or making up the bulk of the Distilled Spirit	... ..	0 1 6
	2 Trial Glasses, for Sikes' Hydrometer, to allow the trial of a smaller quantity of Spirit than the ordinary ones, each	... ..	0 1 3
	1 Improved Gas Lamp	... ..	0 10 6
	Or Spirit Lamp to Slide on Telescope Stand of Still...	... ..	0 10 6
	12 feet Flexible Tube for connecting the water or gas supply	... ..	0 5 0
	1 Thermometer in Leather Case	... ..	0 7 6
	Sike's Hydrometer, with Weights and Thermometer, complete, in a Mahogany Case, and Book of Tables	... ..	3 3 0
	Or Keene's Wine Hydrometer, requiring no Weights...	... ..	2 15 0
	Thermometer in White Metal Case	... ..	0 15 0

Strong Packing Case for the above with division, suitable for export, 5/6.

DIRECTIONS FOR USE.

PUT THE STILL IN WORKING ORDER by attaching the water supply, which may be a Cistern or Cask placed three or four feet above the top of the Condenser; the connection is to be made by Flexible Tube from the Cock in the Cistern to the Tube marked on the Condenser, the outflow of water being conducted from the Tube (O) into a pail; the quantity used may be regulated by the Cock in the Cistern; the water having been found to flow through the Condenser in a continuous stream, the Gas Lamp should be connected also by means of Flexible Tube, with a Gas Pipe, and lighted on the top of the Gauze; where Gas is not obtainable, an Argand Spirit Lamp will be supplied.

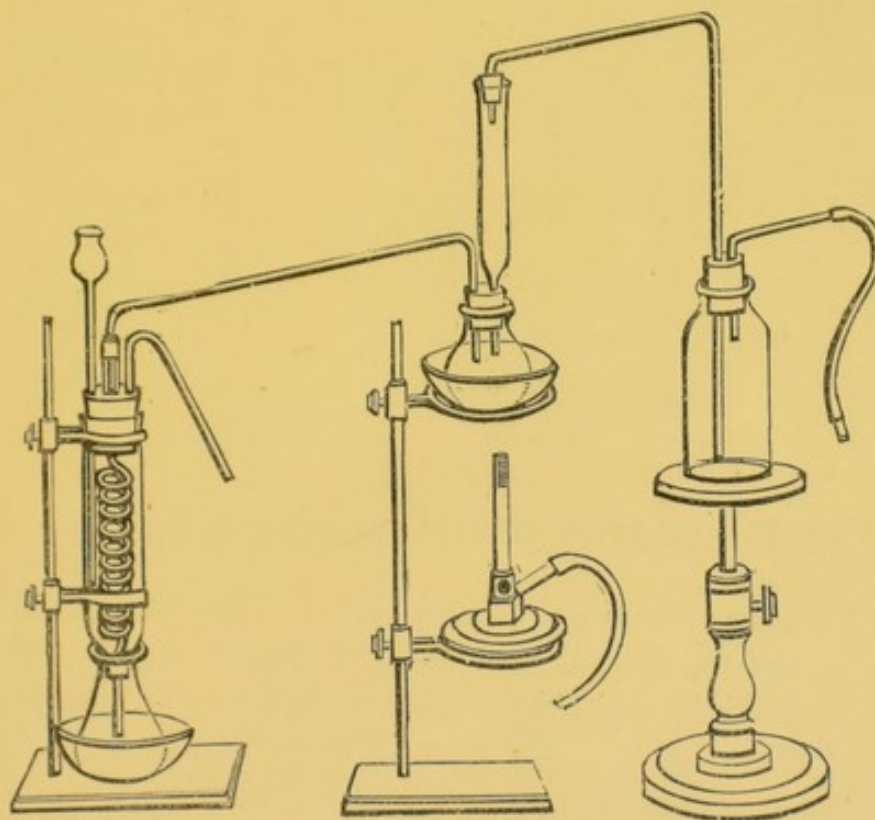
TRIAL OF A SAMPLE.—Fill the Standard measure glass with Wine up to the highest mark, adjusting the exact quantity by using the Pipette or Dropping Tube; pour the measured Wine into the Still Flask, rinsing out the Measure with a little water, which must be added to the Wine; the Measure being quite clean, is placed upon the Bracket and adjusted to receive the Distilled Wine Spirit; the Still Flask is then to be screwed tightly to the Condenser, interposing an Elastic Washer between the top of the Flask and the metal shoulder on the Still Pipe; put the Lamp under the Still Flask, at first moderately burning, afterwards increasing the flame; in a few minutes the Wine will boil, and the vapourized Spirit will begin to condense, falling into the Measure. Repeated experiments have proved that with weak Wines, such as contain under 26 per cent. of Proof Spirit, it is only necessary to distil over one-half the bulk; but stronger Wines, containing much extractive, require the distillation to be continued until two-thirds are distilled; the standard measure is therefore graduated at two-thirds as well as one-half. When the required point on the Measure is obtained, the original measure of the Wine (to the highest mark) is to be made up with water, then poured into the trial glass, stirred well, so that the Spirit and water may be perfectly mixed, with the thermometer the temperature observed, and the strength taken by Sikes' Hydrometer according to the usual tables.

To insure extreme accuracy, it is necessary that the temperature of the Wine before distillation, and the Spirit and water before taking the strength by the Hydrometer, should be the same, that the two bulks may be identical.

SET OF APPARATUS FOR THE ESTIMATION OF SULPHUR IN SPENT OXIDE.

Old
Cat.No.

1487 1712 Arranged by MR. STEPHENSON, Gas Purification Company, London, and
used by most of the Gas Companies in the United Kingdom.



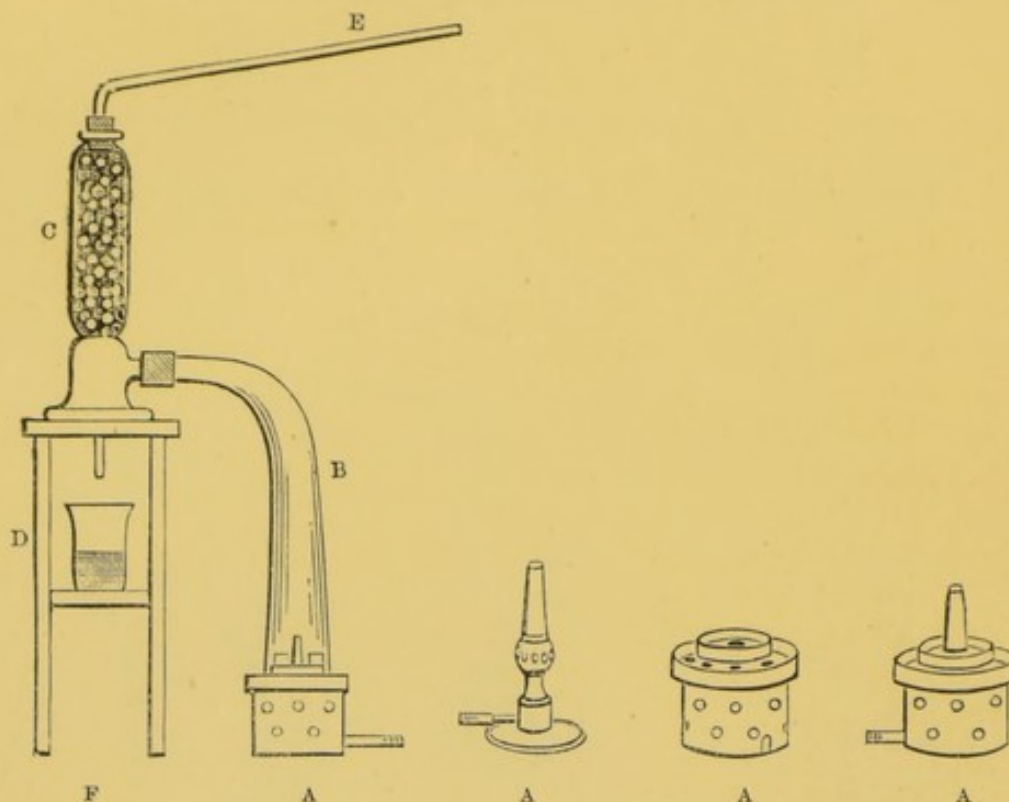
Glass Condenser with Worm, fitted with Thistle
Funnel, Bent Tube, and Syphon.
Conical Flask.
2 Deep Tin Sand Dishes.
2 Retort Stands, 17-in. Rod, with 2 Rings.
Bunsen's Gas Burner.

Flask fitted with Sulphur Tube and bent
Tube.
2 feet Vulcanized Rubber Tube.
Bottle with Wide Mouth and Cork fitted with
Bent Tube and Outlet Tube.
Rising Table.

Packed in Case, 21/.

Sulphur Tubes	each	£0 0 6
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**APPARATUS ADOPTED BY THE METROPOLITAN
GAS REFEREES FOR TESTING THE PURITY, &c.,
OF COAL GAS.**

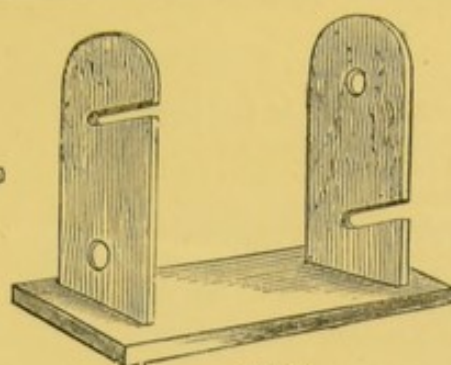


SULPHUR COMPOUNDS.

Old Cat.No.	1488	1713	Bunsen's Burner (A), with Steatite Top, on Metal Cylindrical Stand, with holes for Admission of Air, and Circular Channel to receive Wide End of Trumpet Tube	£0 12 6
1489	1714	Trumpet Tube (B)	0 3 0	
1440	1715	Vertical Glass Cylinder (C), with hole at bottom for Glass Tube to pass through	0 5 6	
	1716	Glass Marbles for Cylinder, per 100	0 3 0	
	1717	Bohemian Glass Beaker for collecting the Condensed Liquid	0 0 8	
1441A	1718	Condenser Tube Bent (E)	0 3 0	
1442A	1719	Wood Table Support, with Shelf (F), for Cylinder and Beaker	0 4 0	
	1720	Vulcanised Rubber Tube for Gas Burner, per foot	0 0 6	
	1721	,, Stout Red for Sulphur Cylinder and Condenser Tube, 1 in. internal diameter, per foot	0 3 6	



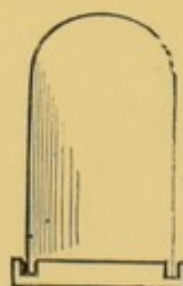
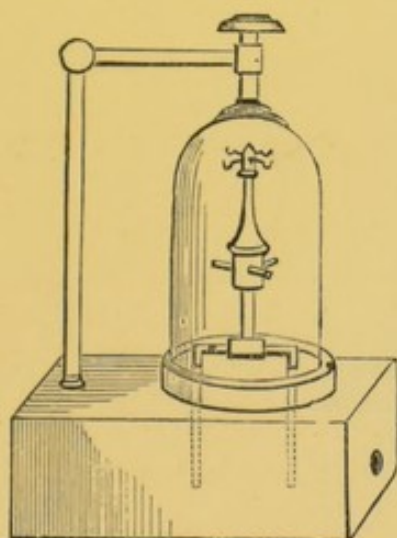
1722



1723

FOR AMMONIA.

Old Cat.No.							
1444B	1722	Ammonia Cylinder, filled with glass beads, with Stopcock and Stoppered Tube	...	...	...	...	£0 12 6
1444c	1723	Wood Stand for ditto (H)	...	...	...	...	0 6 0
	1724	Burette, 100 septems graduated into 100 divisions, with Clip and Jet	...	...	...	...	0 3 6
	1725	Burette Stand, with Clamp	...	...	...	...	0 4 6
	1726	Pipette, with mark to deliver 25 septems	...	...	...	...	0 0 9
		" 50 " "	...	...	...	...	0 1 0
	1727	Test Sulphuric, 25 septems, will neutralize 1 grain Ammonia Winchester quart	...	...	...	...	0 10 0
	1728	Test Ammonia, 100 septems=1 grain Ammonia, Winchester quart	...	...	...	...	0 10 0



1729

SULPHURETTED HYDROGEN.

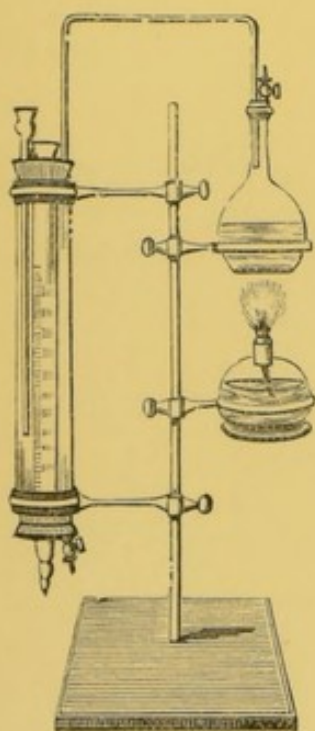
1729	Apparatus through which the gas passes from the service pipe, consists of a Glass Shade, Perforated Metal Tube, with connections for inlet and outlet of gas, and hook supports for Test Paper, Earthenware Tray, with circular channel to hold Mercury for Glass Shade, Wooden Stand with Rod and Spring Clamp	...	...	...	...	£2 0 0
1730	White Bibulous Paper, per quire	...	...	1/4 and	...	0 2 0

CHEMICALS IN GENERAL USE.

Carbonate Ammonia, in 7-lb jars	per lb.	£0 0 10
Hydrochloric Acid, Pure	"	0 0 5
Barium Chloride ,,	"	0 1 0
Silver Nitrate ,,	per oz.	0 4 0
Ammonia Solution, strong, Pure	per lb.	0 1 4
Sulphuric Acid, Sp. G. 1840 ,,	"	0 0 6
Hamatine Tincture	pint	0 5 0
Distilled Water	gallon	0 0 6
Cochineal Tincture	pint	0 8 0
Mercury	(varies) per lb.	0 3 6

For Prices of other Chemicals and Apparatus see General Catalogue.

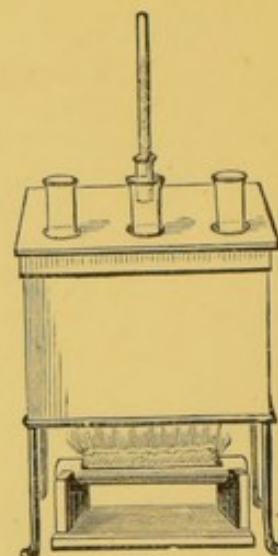
APPARATUS EMPLOYED BY Mr. MacIVOR IN TESTING LUBRICATING OILS.



1731

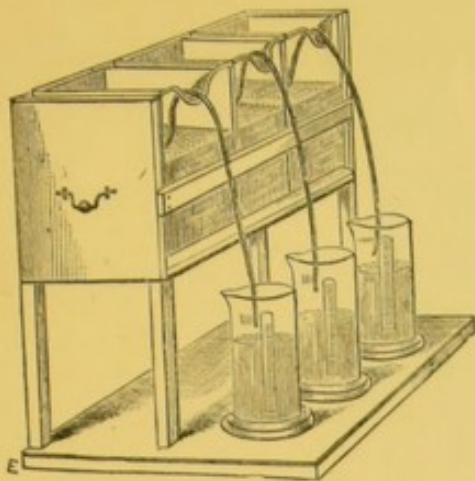


1732

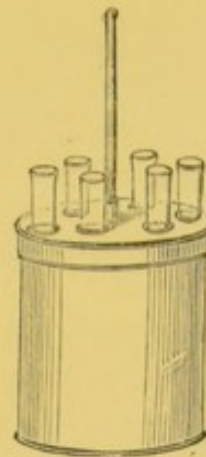


1733

Old Cat.No.	1500	1731	Viscosity Apparatus, on Iron Stand with Brass Rings, Vulcanised Rubber Stoppers, Graduated Tube, &c., with Thermometer, complete...	£2 0 0
1501	1732	Flash Point Apparatus, with Thermometer	0 11 6	
1502	1733	Specific Heat Apparatus, Copper Bath on Iron Stand, and long Brass Tube to hold wick and spirit, on Stand, with Thermometer	1 0 0	



1734



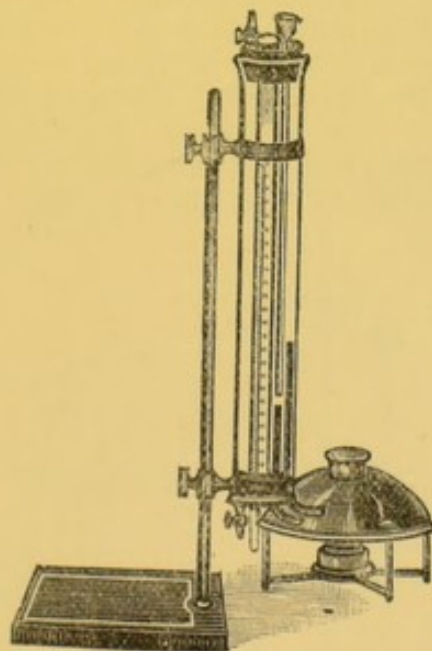
1735



1736

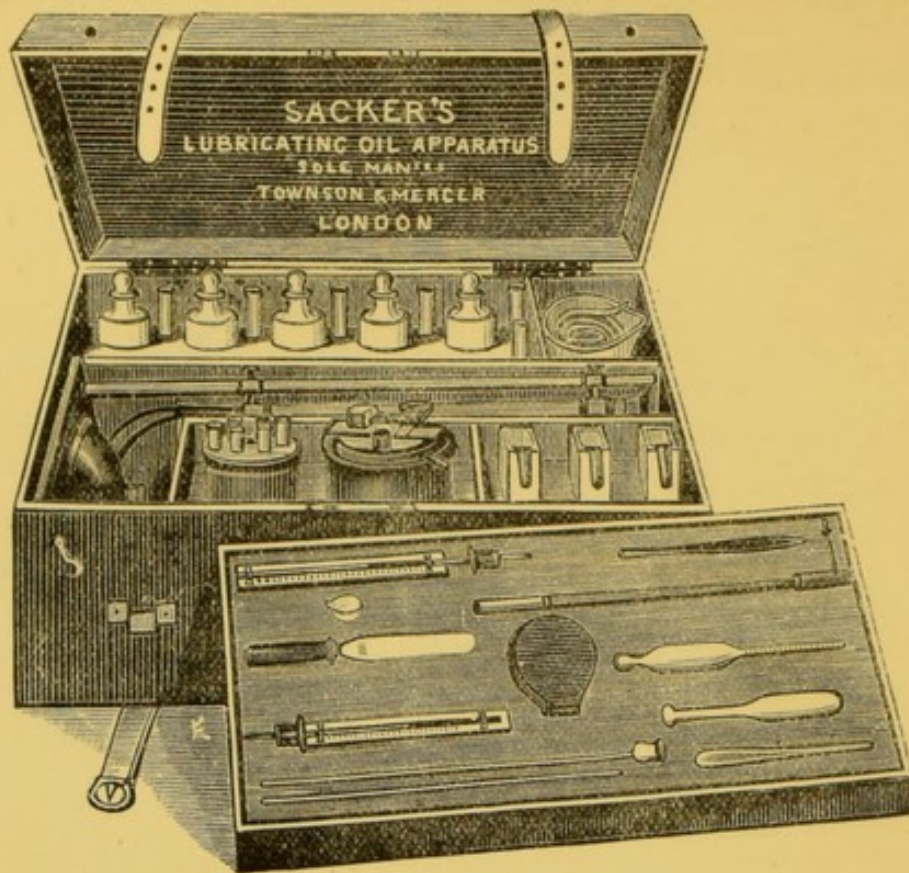
Old Cat.No.					
1503	1734	Capillarity Apparatus.	3 Glass Vessels, marked; on Mahogany Stand, and 3 Graduated Measures ..	£1	2 6
1504	1735	Solidification Apparatus.	A Glass Vessel for Ice or Freezing Mixture, japped tin cover with 6 holes for 6 test tubes, and Thermometer	0	9 6
1505	1736	Metal Oxidation Test	... ..	0	1 0

SACKER'S REGISTERED APPARATUS FOR TESTING LUBRICATING OILS.



1737

1506	1737	Viscosity Apparatus, on Iron Stand, improved by Mr. SACKER (Registered), with Brass Rings, Vulcanized Rubber Stopper, Graduated Tube, Thermometer, Copper Boiler, Spirit Lamp and Tubes for keeping water in Jacket at an even temperature	£2	10	0
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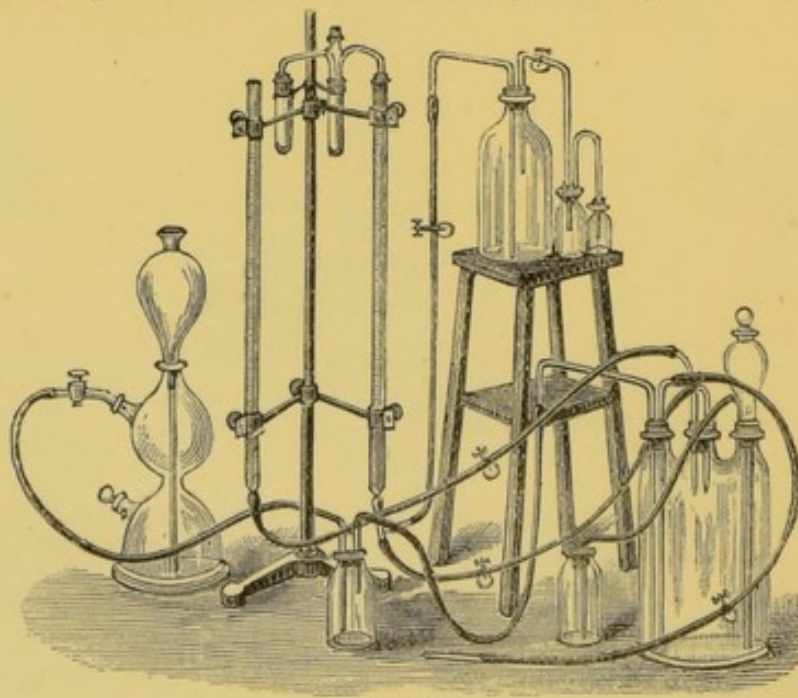


1738

SACKER'S TEST CABINET.Old
Cat.No.
1507

1738 Consisting of Viscosity Tubes on Stand with Lamp and Boiler as Fig. 1737. Government Flash Test with 2 Thermometers, Solidification Jar, with metal cover and tubes, Capillarity Stand with 3 glass jars and graduated measures, 2 Platinum Capsules, Metal Oxidation Test, Hydrometer, Blowpipe with Platinum Jet, Mortar and Pestle, Stoppered Bottles, Chronograph in Morocco Case, &c., fitted in polished Mahogany Cabinet lined with cloth and leather straps outside for convenience of portability.

Price £20 0 0



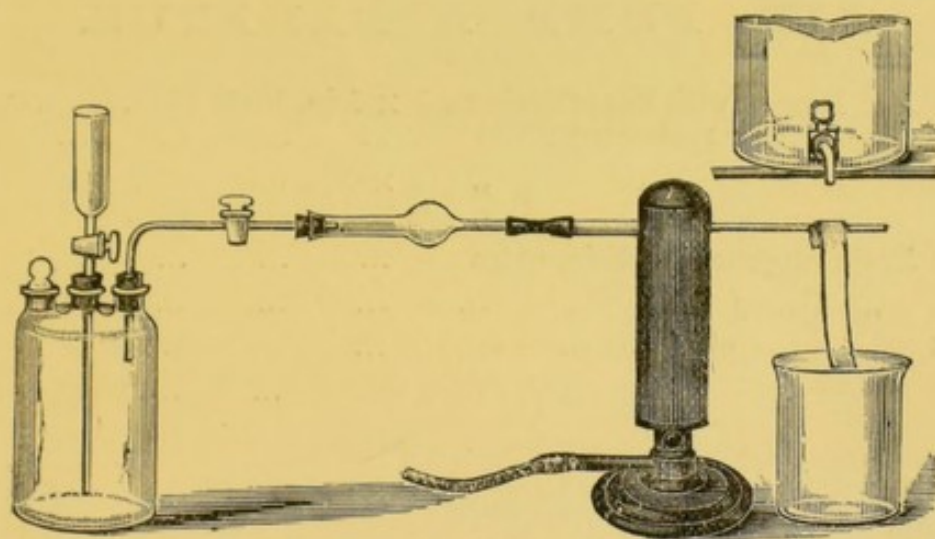
1739

SCHUTZENBERGER'S APPARATUS FOR THE DETERMINATION OF THE DISSOLVED OXYGEN IN WATER.

ARRANGED AND MODIFIED BY DR. DUPRÉ AND MR. W. J. DIBDIN.

Old
Cat.No.

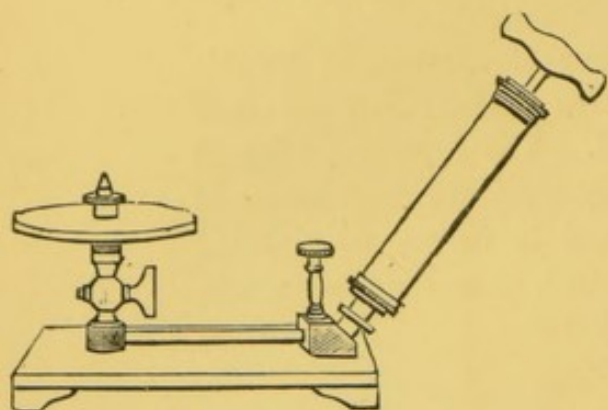
1508 1739 The determination of the degree of Aeration of Potable Water has hitherto seldom been made in consequence of the tedious processes involved. The apparatus designed by Schutzenberger has happily supplied a ready means of making the determination, and in its present modified form it leaves little to be desired, as an examination can now be conducted in a few minutes Price £4 4 0



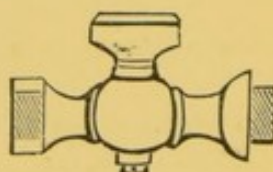
1740

- 1509 1740 **Reinsch's Arsenic Test Apparatus**, consisting of Woulffe's Bottle, with Cylindrical Funnel and Stopcock, Chloride of Calcium Tube fitted with Glass Stopcock, Bunsen's Burner, Clay Chimney, and Aspirator with Stopcock, as recommended in "Our Domestic Poisons" by Mr. H. Carr complete £1 0 0
- 1510 1741 **Reinsch's Test for Arsenic**—8 oz. Hydrochloric Acid, guaranteed pure, $\frac{1}{4}$ oz. Electro Copper Foil, 8 in. Thin Platinum Wire, 1 Spirit Lamp, 2 Test Tubes, 1 Test Tube Holder, 1 Pair Pliers, 25 Thin Glass Tubes Closed at one end 3 in. \times $\frac{1}{4}$ in., 1 Piece Thin Sheet Brass 4 in. \times $1\frac{1}{2}$ in. Packed in Box complete 0 8 6

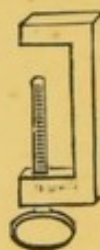
PNEUMATICS.



1742



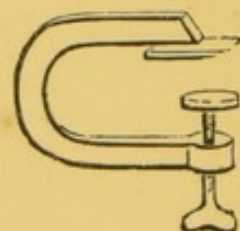
1743



1744



1745

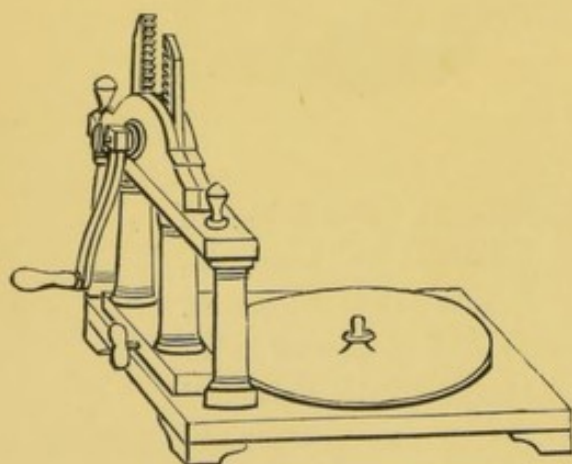


1746

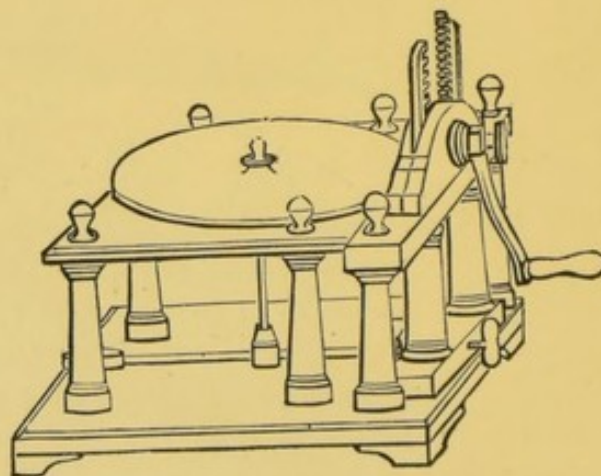
AIR PUMP APPARATUS.

Old
Cat.No.

1017	1742	Air Pump, with Brass Syringe, 5 × 1 in. Plate 4½ in. diam. on polished mahogany stand	...	...	...	...	£1 0 0
	"	"	"	7 × 1¼	"	5	1 5 0
	"	"	"	8 × 1½	"	5¾	1 15 0
1018	1743	Brass Stopcock for ditto, extra	..	...	...	...	0 4 6
1019	1744	" Clamp	...	...	...	...3/ and	0 6 6
1020	1745	" " piece	...	...	...	...1/6 "	0 3 0
1021	1746	Iron " "	...	...	...	...2/ "	0 5 6

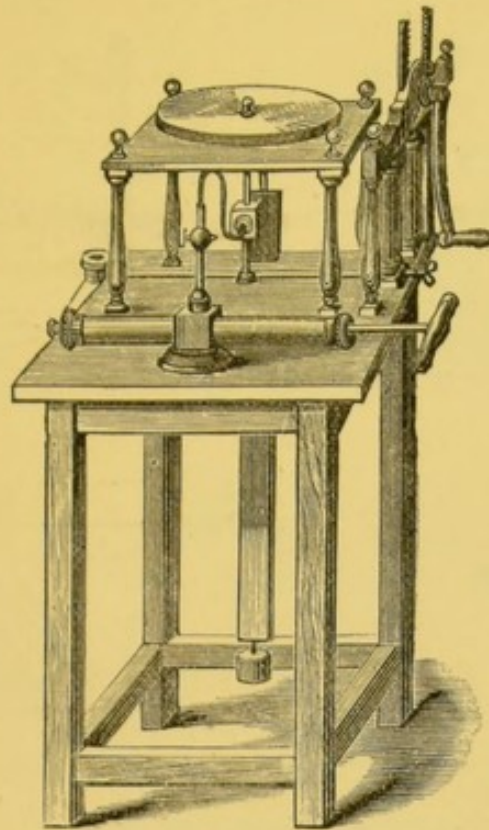


1747



1748

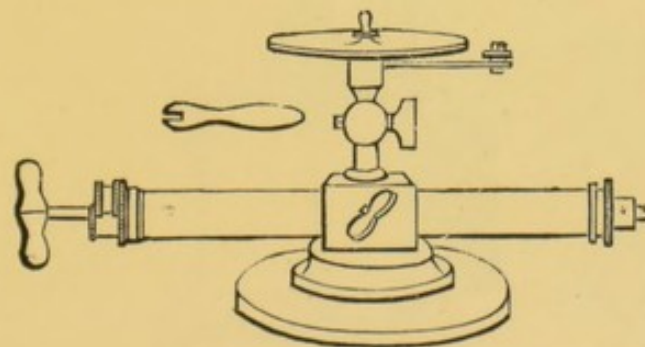
1022	1747	Air Pump, double barrel, on polished mahogany stand—					£5 0 0
						Plate 7 in. diameter	6 10 0
						" 8 " "	10 10 0
1023	1748	" " on raised stand, with gauge-plate and stopcock	...	...	...	Plate 8 in. diameter	



1749

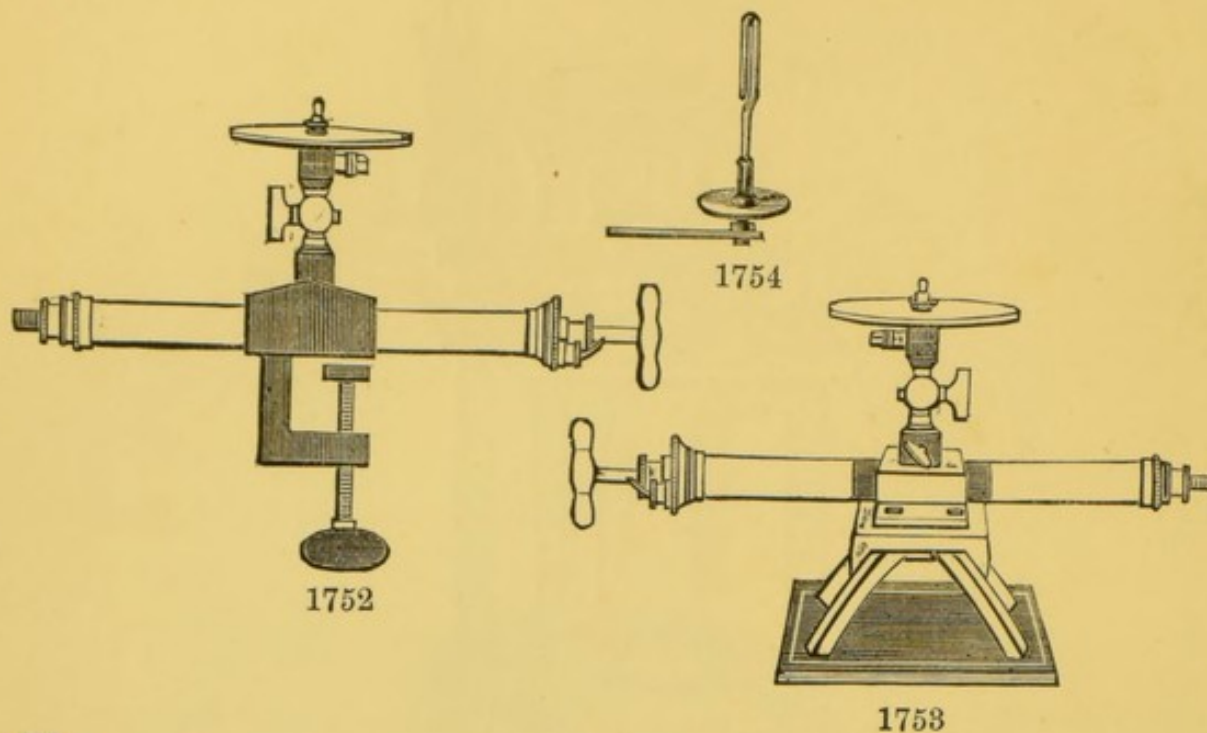
Old
Cat.No.

1023A	1749	Air Pump , double barrel, on polished mahogany stand, plate 13 in. diameter, with two vertical barrels, and Tate's pump fitted for more perfect exhaustion, Mercury gauge and scale	...	...	...	...	£30	0	0
1023B	1750	Do. do., with hollow globe, for more perfect vacuum	...	...	...	...	35	0	0



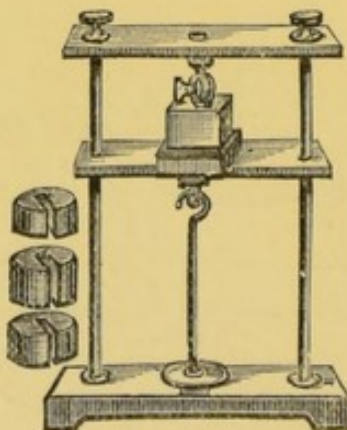
1751

1024	1751	Air Pump , Tate's, Plate 7 in. diam., syringe 16 in. × 1½ in. on solid iron base	£3	12	6
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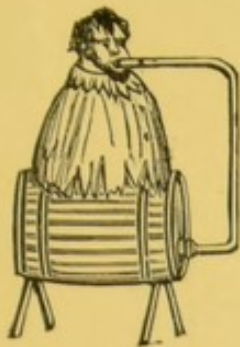
Old
Cat.No.

1025	1752	Air Pump, Tate's, with clamp to fix securely on table, as recommended by the Science and Art Department	£3 10 0
1026	1753	„ „ Plate 7 in. diameter, for syphon gauge, mounted on a solid japanned iron stand	3 15 0
1026A	1754	„ „ Syphon Gauge and Plate, extra ...	0 7 6

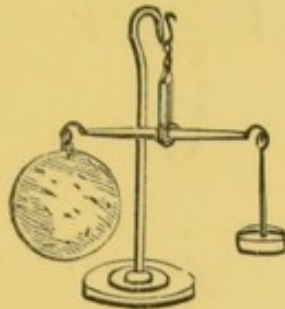


1027

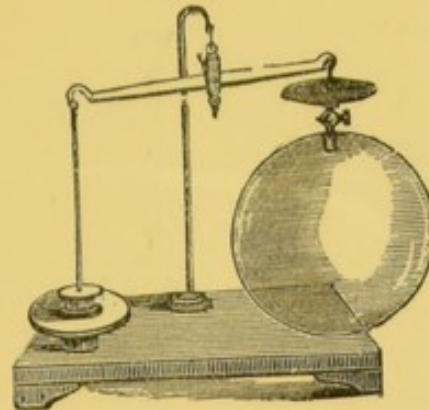
1027	1755	Apparatus for Demonstrating the Pressure of the Atmosphere, with Weights complete	2 17 6
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1756



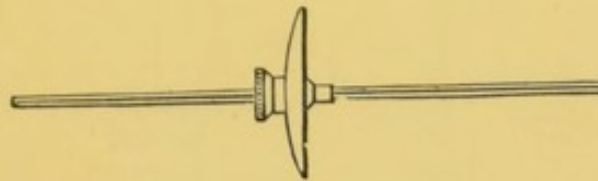
1757



1758

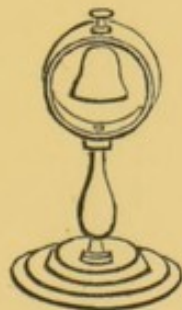


1759

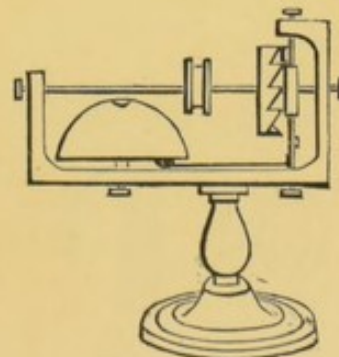


1760

Old Cat.No.							
1028	1756	Bacchus Experiment to Illustrate the Elasticity of the Atmosphere	£1 15 0
1029	1757	Balance Weight and Cork	...	...	...	...	0 7 6
		Balloons, Gold Beaters' Skin and Collodion	<i>(See page 25).</i>				
1029A	1758	Glass Globe, fitted with Stopcock and plate, balance on mahogany stand, with counterpoise for weighing gases, &c.	...	...	...	...	1 0 0
1029B	1759	Light Glass Flask, capacity about 50 cubic inches, fitted brass Stopcock and hook, and extra brass screw for attaching to air pump, for estimating specific gravity of gases, &c.	...	...	...	...	0 6 0
		Connector	...	...	...	extra	0 1 6
1030	1760	Barometer Tube and Collar	...	...	...	...	0 8 6

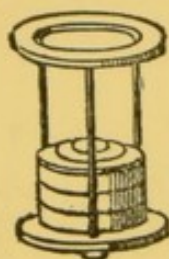


1761

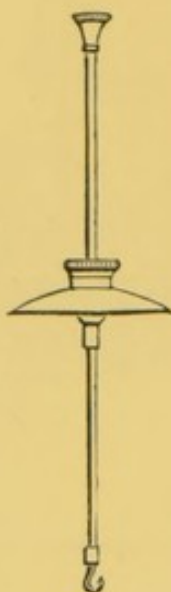


1762

1031	1761	Bell Experiment for Illustrating that Air is essential to Sound, on mahogany stand	...	...	...	...	£0 5 6
1032	1762	„ „ with ratchet movement, on brass stand					1 5 0
1033	1763	„ „ to be rung by electricity, with receiver					1 12 6



1764



1766



1767



1765



1768

1771



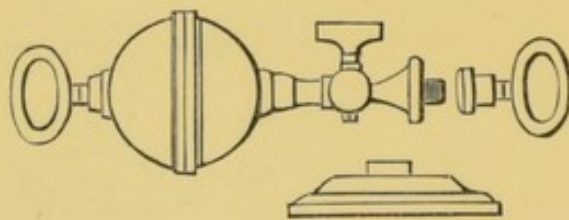
1772

Old
Cat.No.

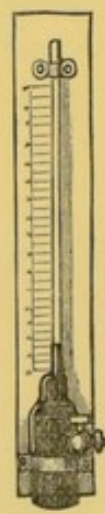
1034	1764	Bladder and Lead Weight	...	...	...	...	£0	7	6
1035	1765	„ Glass	...	...	...	...	0	1	6
1036	1766	Collar and Hook	...	...	6/	and	0	10	6
1037	1767	Filtering Cup or Mercurial Shower	...	...	2/6	and	0	5	0
1038	1768	Fountain in Vacuo	...	...	...	...	0	4	6
1039	1769	„ „ Pressure	...	...	...	...	1	0	0
1040	1770	Fruit and Taper Stand	...	...	...	...	0	1	9
1041	1771	Guinea and Feather Experiment,	2 falls	16/	;	3 falls	1	0	0
1042	1772	„ „ „ Tall Glass Receiver for do.,	16 × 3	top × 4	in. bottom		0	7	0



1773



1774



1777



1779

1043	1773	Lung's Glass	...	...	...	...	£0	5	0
1044	1774	Magdeburg Hemispheres, accurately ground, diam. 2½ in.					0	12	6
		„	3¼	„			0	15	6
1044A	1775	„ „ Iron	„	„	3¼	„	0	8	0
		„ „ „	„	„	4¼	„	0	10	6

Old Cat.No.	1045	1776	Manometer ...	...	...	...	...	...	£0 17 6
	1046	1777	„ with Compressed Air...	...	...	...	...	...	1 15 0
	1047	1778	Model of Diving Bell	...	...	...	...	...	1 5 0
	1048	1779	Plate and Hook, brass	...	...	...	...	...	0 3 6



1049 1780 Receivers for Air Pump, with knob at top and welt at bottom, accurately ground—

Height to Shoulder	7	7	8	9	10 in.
Diameter	...	5	5 $\frac{3}{4}$	7	8
		2/6	3/6	4/6	5/6
				7/6	

1050 1781 Receivers, Tall, with knob and welted—

Height to Shoulder	9	10	12 in.
Diameter	...	4	5 in.
		2/6	3/6
			4/6

1051 1782 Receivers, Open, welted top and bottom, accurately ground—

Height	7	7	8	9 in.
Diam.	5	5 $\frac{3}{4}$	6	7 in.
		2/6	3/6	5/6
				7/6

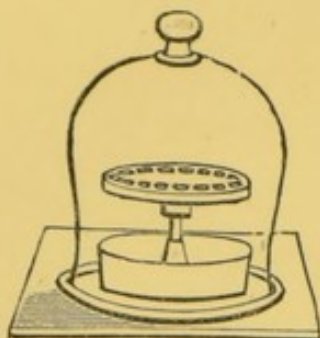
1052 1783 Air Pump Receivers—

Height to Shoulder	7	7	8	9 in.
Diameter	...	5	5 $\frac{3}{4}$	6 $\frac{1}{2}$
		2/6	3/6	4/6
				5/6

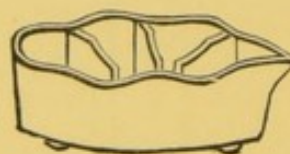
Old
Cat.No.

1058 1784 Air Pump Receivers, Shallow, also used as desiccating covers—

Height to shoulder	4	4	4	5 in.
Diameter ...	6	6½	7	8 in.
	2/	2/3	2/6	3/



1785



1787

1054 1785 Porcelain Sulphuric Acid Dish, with perforated wooden table to fit the pan, for funnels, capsules, &c.—

Diam. of pan 5 ins. £0 3 0

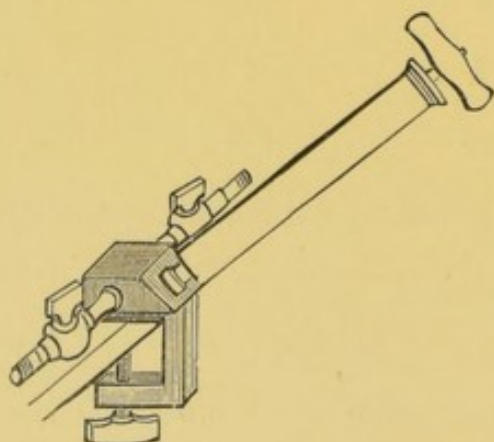
1055 1786 ,, with ground glass plate and cover, complete 0 7 6

1056 1787 Porcelain Sulphuric Acid Dish, with partitions for the support of capsules under a glass receiver—

„	„	Berlin porcelain	4¾ in. diam.	£0 4 6
„	„	Dresden	4⅛ „	0 3 0
„	„	„	4⅞ „	0 3 6

See also Drying Apparatus, page 62.

1788



1790



1791



1792

1057 1788 Brass Syringe, Exhausting or Condensing—

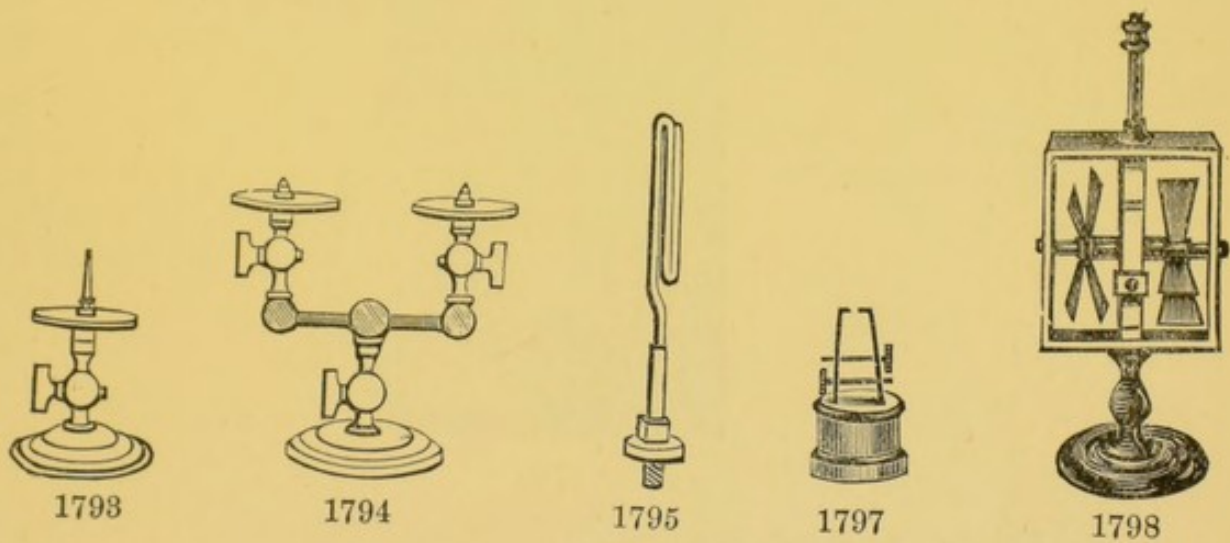
Length of cylinder 5 in., diameter 1 in. £0 7 0

„ „ 7 „ „ 1¼ „ 0 10 6

„ „ 8 „ „ 1½ „ 0 12 6

Old
Cat.No.

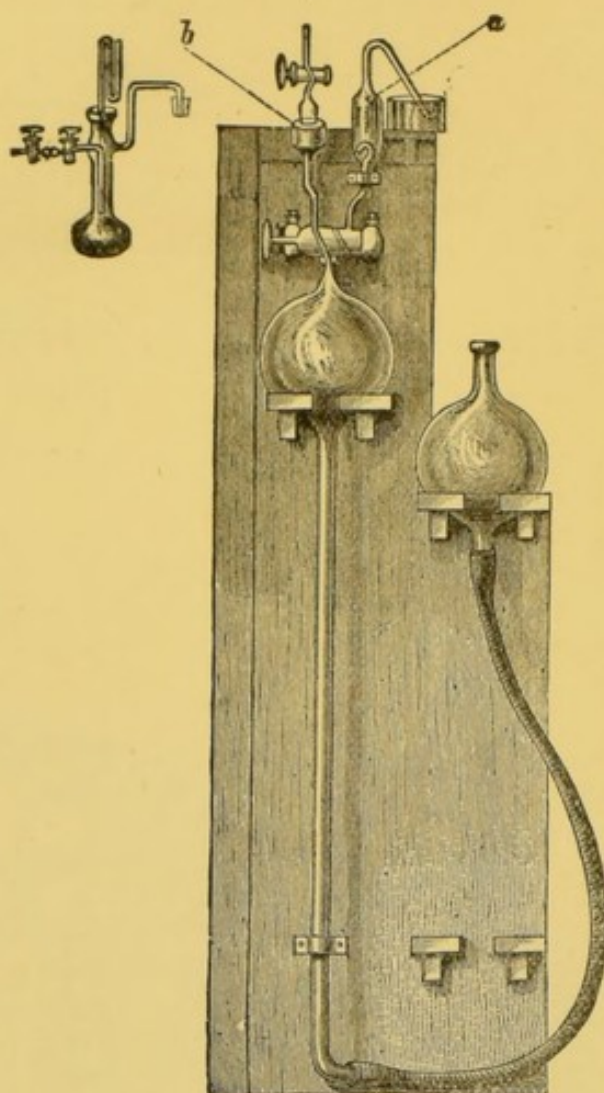
1058	1789	Brass Syringe, Exhausting and Condensing—						
		Length of cylinder 5 in., diameter 1 in.					£0	10 0
		„ „ 7 „ „ 1¼ „					0	12 6
		„ „ 8 „ „ 1½ „					0	15 0
1059	1790	„ „ Exhausting and condensing, with clamp to fit to table, for organic analysis ...					1	7 0
1059A	1791	Tallow Holder, Mahogany, with Screw, for greasing edges of glass vessels, &c., previous to use with air pump 1/ and					0	1 6
1059B	1792	Breaking Squares per doz.					0	6 0



1060	1793	Transferer, Single					£0	9 0
1061	1794	„ Double					0	15 6
1062	1795	Vacuum Gauge					0	3 6
1062A	1796	„ „ arm for					0	4 0
1063	1797	Weight and Clip					0	5 6
1064	1798	Windmill, with shifting vanes to show the resistance of air					1	17 6

Set of Air Pump Apparatus, see Cheap Sets.

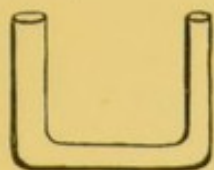
MERCURY AIR PUMP.



1799

- 1799 Friedrich's New Mercury Air Pump—This Pump resembles in its general arrangement the Geissler Pump, but exact work is greatly facilitated by its being supplied with the new Patent Stopcocks; it can be easily taken to pieces and cleaned. In order to avoid a rushing up of the Mercury, which might damage the Pump, care should be taken to lift the same slowly and gradually; the Drying Apparatus is to be charged with Chloride of Calcium or Anhydrous Phosphoric Acid. This Pump ensures the greatest vacuum yet produced. Mounted on Polished Stand with stout India Rubber Tube, complete £7 10 0
- 1800 Larger size, with Lever for raising Mercury Funnel ... 13 10 0
- 1801 Arrangement for analysis of Blood Gas, extra ... 5 0 0
- 1802 Drying Apparatus, Foam Bulb, Blood Bulb made of different constructions

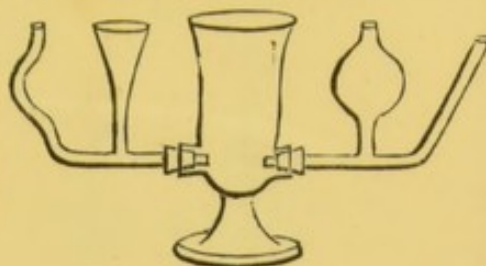
HYDROSTATICS AND HYDRAULICS, &c.



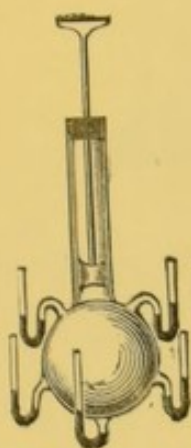
1803



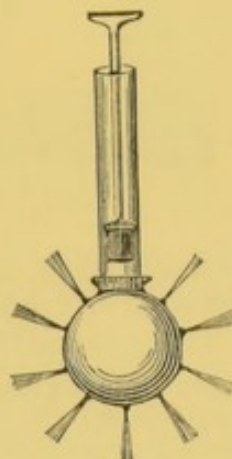
1804



1805



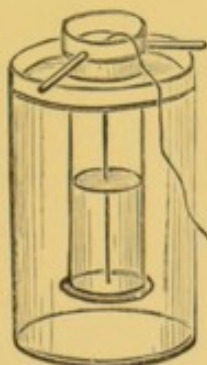
1806



1807

Old
Cat.No.

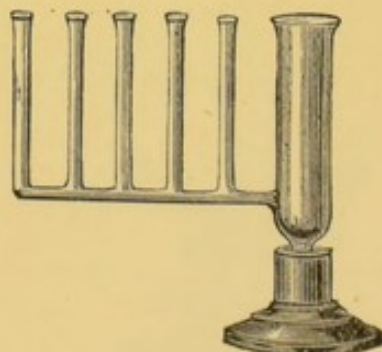
1065	1803	Apparatus, Glass, with two branches to show that water rises to a level in communicating vessels	£0	1	0
1066	1804	„ „ with three branches	0	1	6
1067	1805	„ „ „ five „	0	5	6
	1806	„ „ to shew equal pressure of fluid ...	0	5	0
	1807	„ „ „ „ gas ...	0	6	6



1808



1809

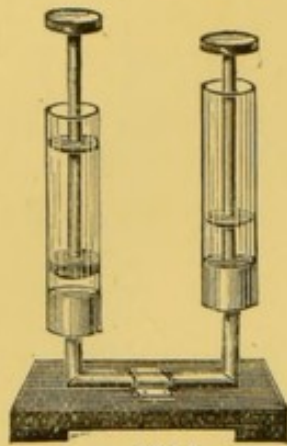


1810

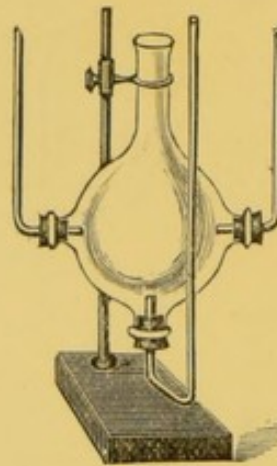
1067A	1808	Apparatus to Illustrate Upward Pressure of Water, consisting of a Glass Cylinder, open at both ends, with Metal Disc, and cord attached to close the bottom of the tube, and outer Glass Jar to contain Water ...	£0	4	6
1067B	1809	Water Level Apparatus, on mahogany stand, with brass fittings, and levelling screws	0	15	0
1067c	1810	Water Capillarity Vessel, with 6 tubes	0	2	6



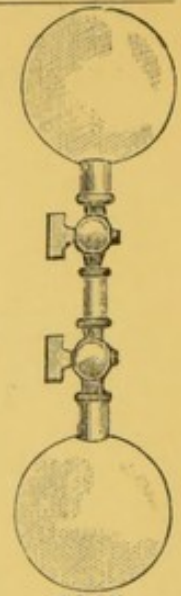
1811



1813



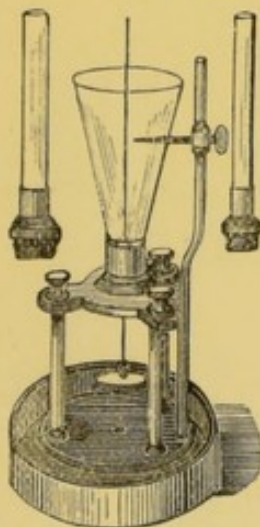
1814



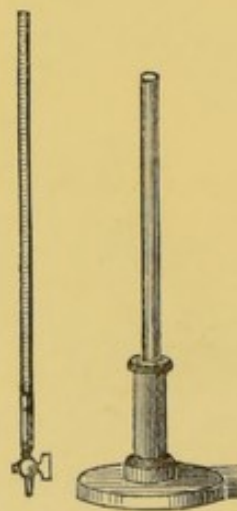
1815

Old
Cat.No.

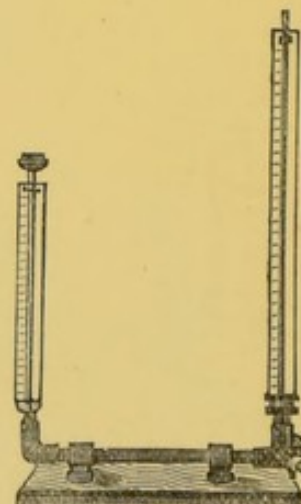
1067D	1811	Communicating Vessel, U form, and two unequal diameters 16 inches long... ..	£0 3 0
1067E	1812	Ditto mounted on mahogany stand, with scale ...	0 6 0
1067F	1813	Apparatus to show pressure of Water, consisting of two Glass Cylinders $1\frac{1}{2}$ in. diameter, with Metal Discs, mounted on mahogany stand	0 8 6
1067G	1814	Glass Globe, about 8 inches diameter, fitted with Tubes, on Iron Stand, with two Rings, to show Pressure of Water in all directions	1 10 0
1067H	1815	Glass Globes, about 6 inches diameter, fitted with Brass Caps, 2 Stopcocks, and Connector to show the Pressure of Mixed Gases	0 15 0
		Iron Stand with Clamps for above	0 7 6



1816



1817



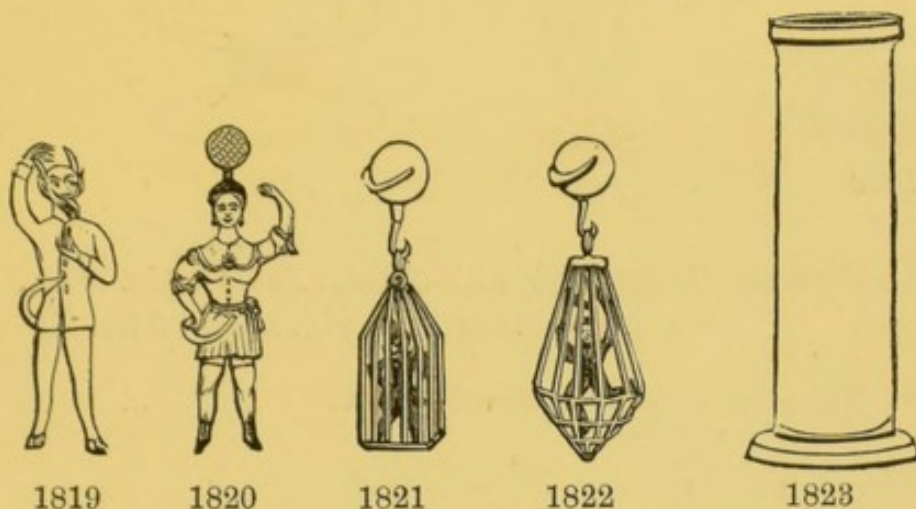
1818

1067I	1816	Pascal's Apparatus, to show that the pressure exercised by a liquid on the bottom of a Vessel depends exclusively on the dimensions of that bottom, and on the height of the column of liquid it supports, consisting of three Glass Vessels of different forms, open at both ends, mounted with Brass Screws, Brass Stand and Trough complete ...	£2 2 0
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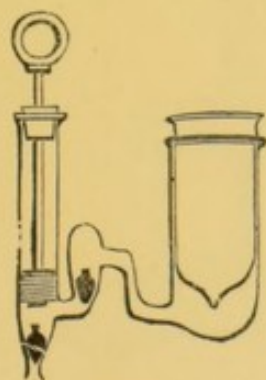
Old
Cat.No.

1067K 1817 **Mariotte's Apparatus**, to show that under pressure air expands to twice its ordinary volume. Graduated Tube and Stopcock, and Tube 24 in. \times $\frac{3}{4}$ in., with stand £0 12 0

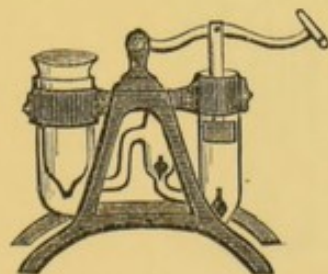
1067L 1818 **Mariotte's Apparatus**, to show that under compression of 2 Atmospheres air is compressed into half its ordinary bulk. 2 Graduated Tubes and Metal Fittings 0 18 0



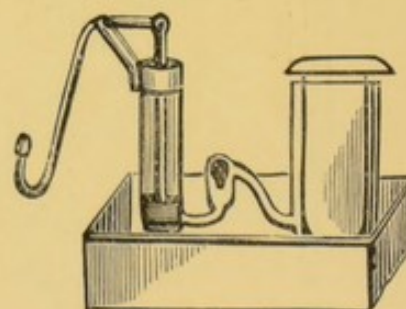
1068 1819 **Cartesian Figure** £0 0 9
 1069 1820 " " 0 0 9
 1070 1821 " " in cage 0 1 0
 1071 1822 " " " 0 1 0
 1072 1823 **Tall Glass for ditto** 0 1 0



1824

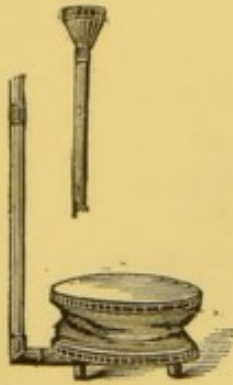


1825

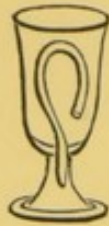


1826

1073 1824 **Hydrostatic Press** £0 4 6
 1073A 1825 " " with brass fittings, on iron stand ... 0 10 0
 1073B 1826 " " with brass fittings, on japanned tin cistern 0 10 0
 1073c 1827 " " Bramah's, metal, with three moveable Knife Edges for breaking Metal Bars, worked by a Lever 5 10 0



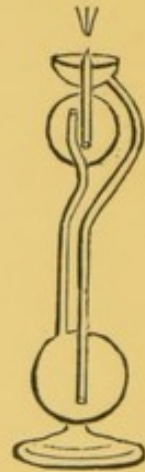
1828



1829



1830



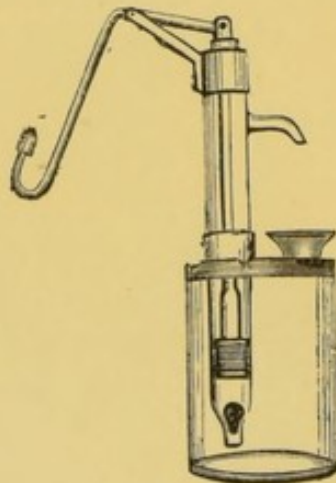
1831

Old
Cat.No.

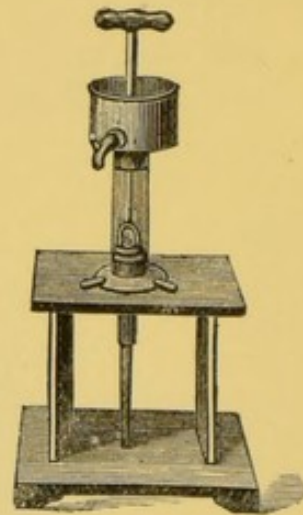
1073D	1828	Hydrostatic Bellows, with Circular Board 12 in. diam., and Metal Side Tube, with Funnel 6 feet high	£1	4	0
1074	1829	Tantalus Cup, with curved Syphon	...	0	1 6
1075	1830	„ „ „ painted figure	...	0	10 6
1076	1831	Heron's Fountain	...	0	5 6



1832



1833

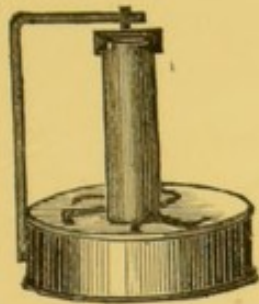


1834

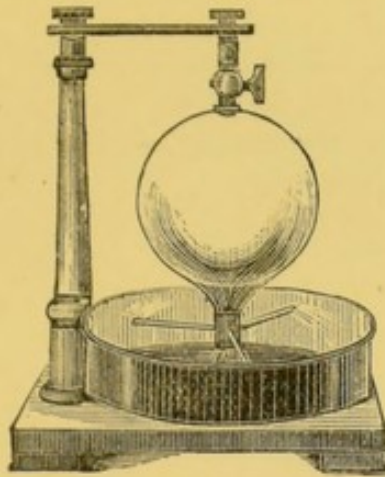
1077	1832	Model Glass House Pump	...	£0	3	0
1077A	1833	„ House Pump, with glass cistern, japanned tin cover, brass handle and fittings, Pump barrel about 8 in. × 1 in.	...	0	8	0

Old
Cat.No.

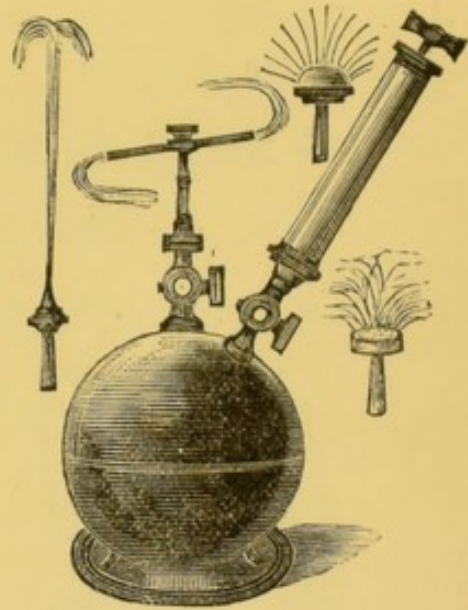
1077 _B	1834	Model House Pump on mahogany stand, glass barrel, 8 in. × 1½ in. diameter, and brass fittings, superior make	£1 10 0
1078	1835	House Pump, brass, with glass barrel, as above, unmounted	0 16 6



1836

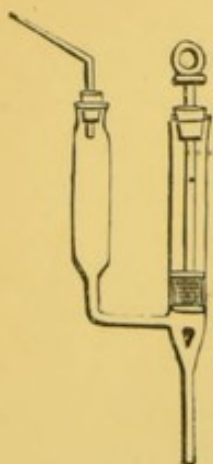


1838

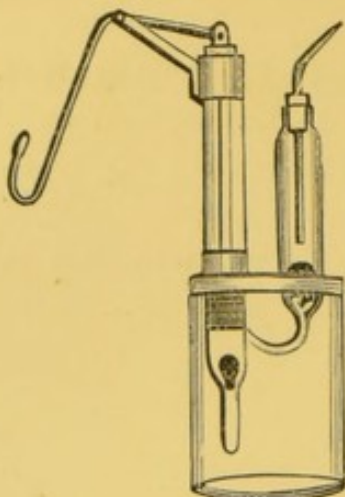


1839

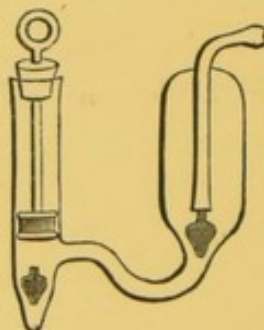
1078 _A	1836	Barker's Mill, for showing Lateral Pressure of Liquids, Japanned Tin, Cistern 8 in. diameter, with 4 Sprays	£0 7 6
1078 _B	1837	Brass Cylinder, 13 in. × 1½ in., Trough 13 in. diameter	1 1 0
1078 _C	1838	(Tourniquet), Pear Shaped, Glass Vessel, Mounted with Brass Caps and Stopcock on Solid Polished Mahogany Frame, Cistern 14 in. diameter	2 2 0
1078 _D	1839	Condensed Air Fountain, Stout Metal Ball, 10 in., diameter, Japanned Well finished with Brass Syringe and 4 Jets, complete	3 3 0



1840

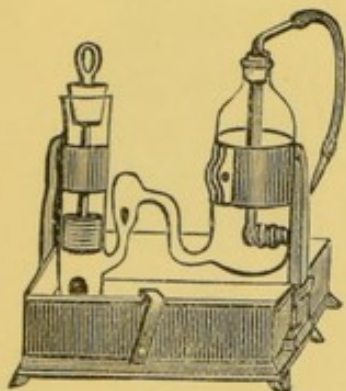


1841

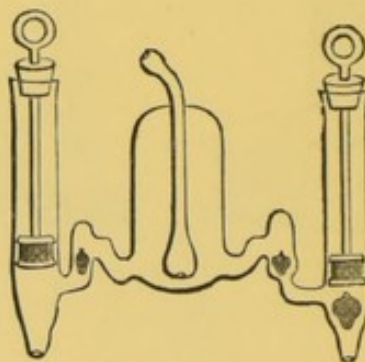


1843

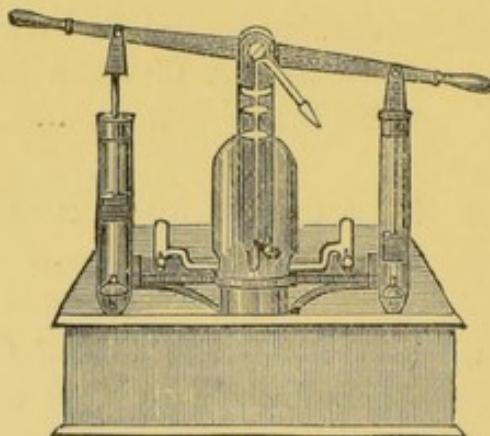
Old Cat.No.	Model	Description	Price (£)	Price (s)	Price (d)
1079	1840	Model Force Pump	£0	3	6
1079A	1841	,, with glass cistern, and japanned tin cover	0	8	0
1080	1842	,, brass, glass barrel, similar to Fig. 1834	2	2	0
1081	1843	,, Single action	0	4	0



1844



1845



1846

1081A	1844	Model Force Pump, with India Rubber Tube, and glass jet, on japanned tin cistern...	£0	10	0
1082	1845	,, Double	0	7	6
1082A	1846	,, double barrel, or Fire Engine, with brass fittings on japanned tin cistern	0	16	0

BAROMETERS.



1847



1848



1854

Old
Cat.No.

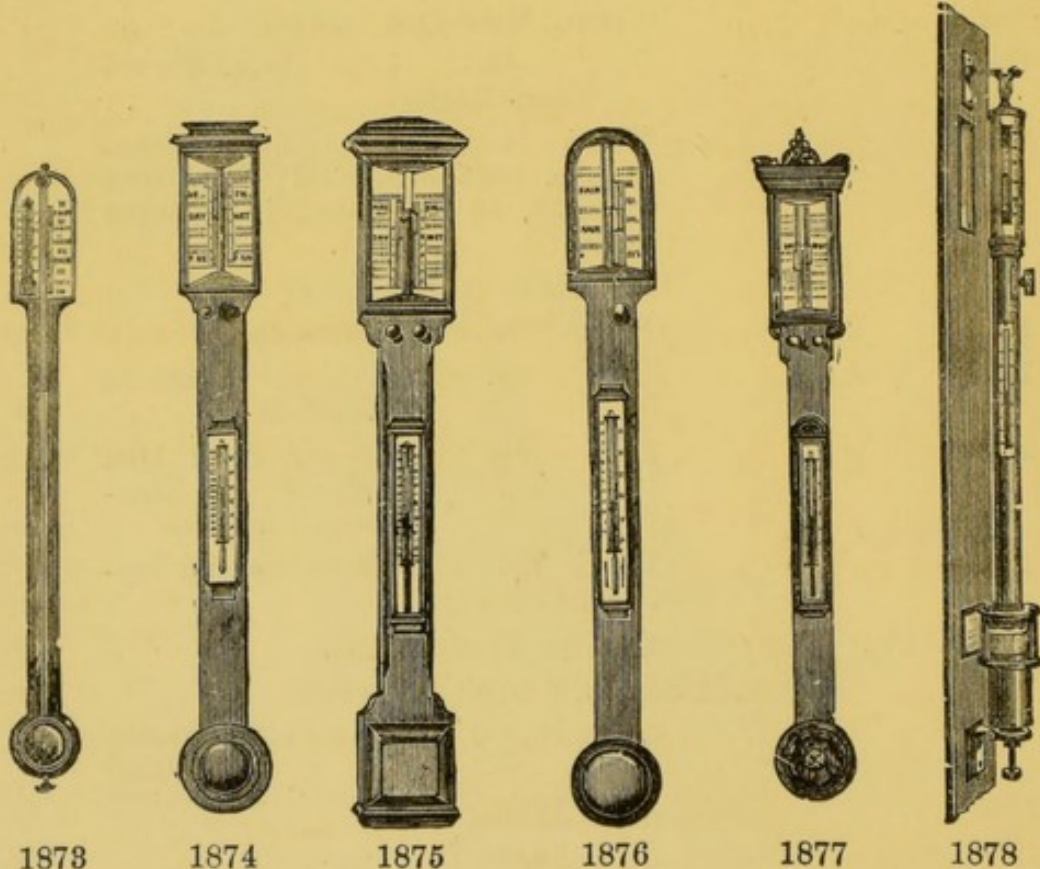
1089A	1847	Barometer, Aneroid,	card dial, 5 in. diameter, in nickel plated case, with Thermometer, best quality... ..	£1 1 0
1089B	1848	" "	silvered dial, 5 in. curved Thermometer, best quality	1 10 0
	1849	" "	Enamelled Card Dial, with Fitzroy Indication, 5 in. Diameter, Curved Thermometer ... best quality	1 10 0
	1850	" "	Do. do. 6½ in. diam. "	1 15 0
	1851	" "	Do. Open Face, 5 in. " "	1 5 0
	1852	" "	Silvered Metal Dial do. 5 in. " "	1 10 0
	1853	" "	Do. do. 5 in. diam. Curved Thermometer	1 15 0
	1854	" "	Watch form, Gilt or Nickel-Plated Cases, hard enamelled Dial, best quality, 1¾ in. diam., in Morocco Case	2 2 0
	1855	" "	Altitude 8,000 feet	2 5 0
	1856	" "	Do. do. with Thermometer ...	2 12 6
	1857	" "	Do. do. with keyless action to Altitude Scale ...	3 3 0
	1858	" "	Do. do. with Singer Pearl Dial Compass and Thermometer on back ...	4 0 0
	1859	" "	Do. do. in Hunter Case and keyless action	4 0 0
1860	Extras—Compensation for Temperature		... ..	0 5 0
1861	Altitude Scales, if made to revolve		... ..	0 2 6
1862	" " " to 10,000 ft., beyond prices quoted for 8,000		... ..	0 5 0
1863	" " " 12,000 ft. " "		... ..	0 7 6
1864	" " " 16,000 ft. " "		... ..	0 10 0
1865	" " " 20,000 ft. " "		... ..	0 12 6

Keyless Action, where not specified, extra 10/6.

Old
Cat.No.

1866	Watch Form Aneroid Barometer Set, consisting of Watch Form Aneroid to 8,000 feet, Ivory Scale Thermometer and Bar Needle Compass in Morocco Case	£4 0 0
1867	Do, do. Oval Pocket Set, as above, with full size Watch Form Compass	4 10 0
1868	Special Surveying and Mining Aneroid Barometer, Compensated, giving readings to single feet of altitude, for use of Surveyors and Engineers. Scale of Altitude admits of sub-division by Vernier Scale, will register 2,000 feet below sea level to 4,000 feet above. Altitude Scale represents 10 feet divisions, which can be subdivided by Vernier to single feet. Stout Bronzed Metal Case, Silvered Dial, Vernier Scale, Rackwork Motion, Reading Lens arranged to traverse the entire circle, Altitude Scale 6,000 feet, compensated for Temperature, in Sole-Leather Sling Case. Diameter 3½ ins....	7 10 0
1869	Do. do. 5 in. diameter, giving more open divisions	7 0 0
1870	Do. do. do. altitude to 10,000 feet	7 10 0
1871	Do. do. do. do. 15,000 feet	7 15 0
1872	Do. do. do. do. 20,000 feet	8 0 0

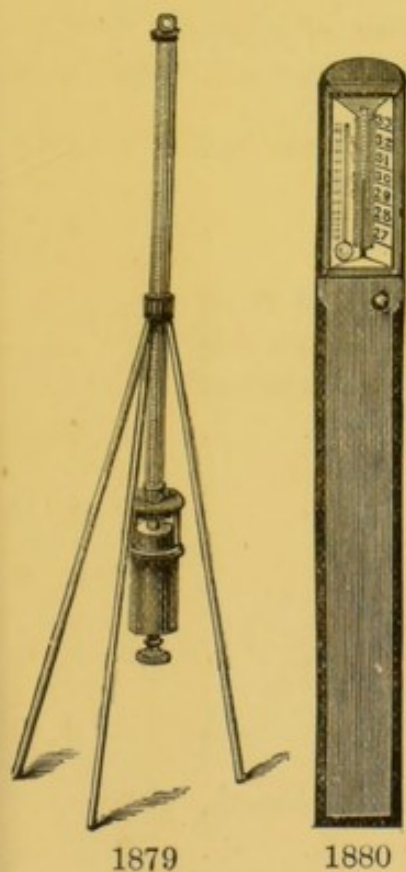
Other descriptions of Aneroid Barometers, in Carved Wood Frames, supplied to order



1089 ^H	1873 Model Barometer, Enamel Scale, with Thermometer, Sliding Vernier, Portable Screw, and Polished Mahogany Frame...	£0 18 6
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Old
Cat.No.

1089I	1874	Model Barometer, Square Top, double Scale, in Polished Walnut Wood Case	£3 3 0
1089K	1875	„ Square Top, Sea Coast, double Scale, ditto	...	4 15 0
1089L	1876	„ Dome Top, double Scale	ditto ...	3 3 0
1089M	1877	„ Carved Top, double Scale	ditto ...	3 3 0
1089N	1878	Standard Barometer, enclosed in a Brass body, Scale divided into English inches 1/20th, and French Cubic inches and millimetres, with Table Vernier, enabling a reading to be taken respectively of 1/500 of an inch, and 1/10th of a millimetre, and Thermometer on Polished Mahogany Board	... ..	15 10 0



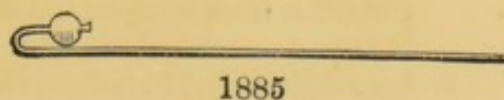
1089O 1879 **Mountain Barometer, on Fortin's principle, enclosed in Nickel body, double Vernier, giving correct readings to 1/500th inch, on Tripod Stand, and Leather Case** £5 15 0

1089P 1880 **Miner's or Pit Barometer, open face, on Solid Oak Frame, with Thermometer and Portable Screw** £1 4 0

1881 **Fitzroy Barometer, in Oxford Frame** £0 18 6

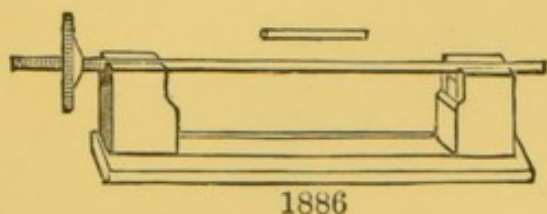
1882 „ **Polished and Carved Top** £1 5 0

1883 „ **Superior finish—**
£1 15 0 £2 0 0 £3 3 0

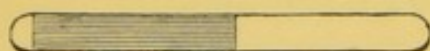


1085	1884	Barometer Tube, plain	... ..	£0 0 10
1086	1885	„ „ with bulb	... ..	0 1 3

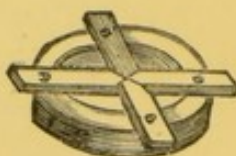
HEAT EXPERIMENTS.



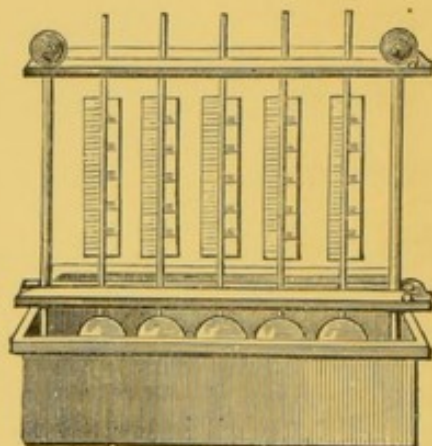
1886



1896



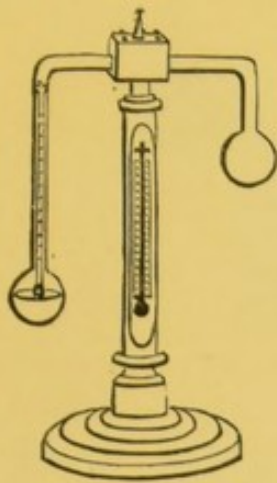
1887



1888

Old
Cat.No.

1083	1886	Apparatus to show the force of contraction of solids, with 12 bars to be broken	£0 9 0
		Bars, Cast Iron, for do. per doz.	0 1 6
1083A	1887	Apparatus to show the conductivity of Metals	0 3 6
1083B	1888	Apparatus to show the difference of expansibility of Fluids, consisting of a set of 5 Bulb Tubes, with box-wood scales, japanned trough to hold hot water, and brass supports	1 0 0
1084	1889	Balls, set of 5, different metals	0 4 0
	1890	„ Copper, with Ring Handle, 5 lbs.	0 8 6
	1891	„ Iron, Set of, 4 lbs. to $\frac{1}{4}$ lb.	0 5 6
	1892	Stand for ditto	0 2 0
	1893	Cylinders, Set of, Copper, Tin, Lead, Iron, Zinc, Bismuth, Cork, and Wood	0 7 6
1087	1894	Bar, Compound of Brass and Iron to show the curvature resulting from unequal expansion	0 7 6
1088	1895	„ „ to show difference in conductivity of metals	0 2 6
1089	1896	Wood and Brass Cylinder to show the different conducting powers of brass and wood	0 2 6



1897



1898



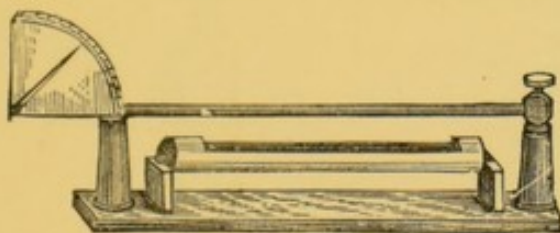
1899



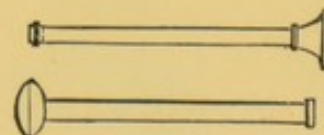
1902

Old
Cat.No.

1090	1897	Daniel's Hygrometer, on polished wood stand ...	...	£0 12 0
1091	1898	Mason's Wet and Dry Bulb Hygrometer, on metal scale, in janned frame ...	... ..	0 10 0
1092	1899	Davy's Safety Lamp ...	... 8/6 and	0 12 6
1098	1900	„ Apparatus for showing reflection in vacuo ...	...	4 10 0
1094	1901	Depretz „ ...	... ..	1 0 0
1095	1902	Eolipile, or Hero's Model Rotatory Steam Engine, mounted on stand, with brass rod, and glass spirit lamp		0 7 6



1903

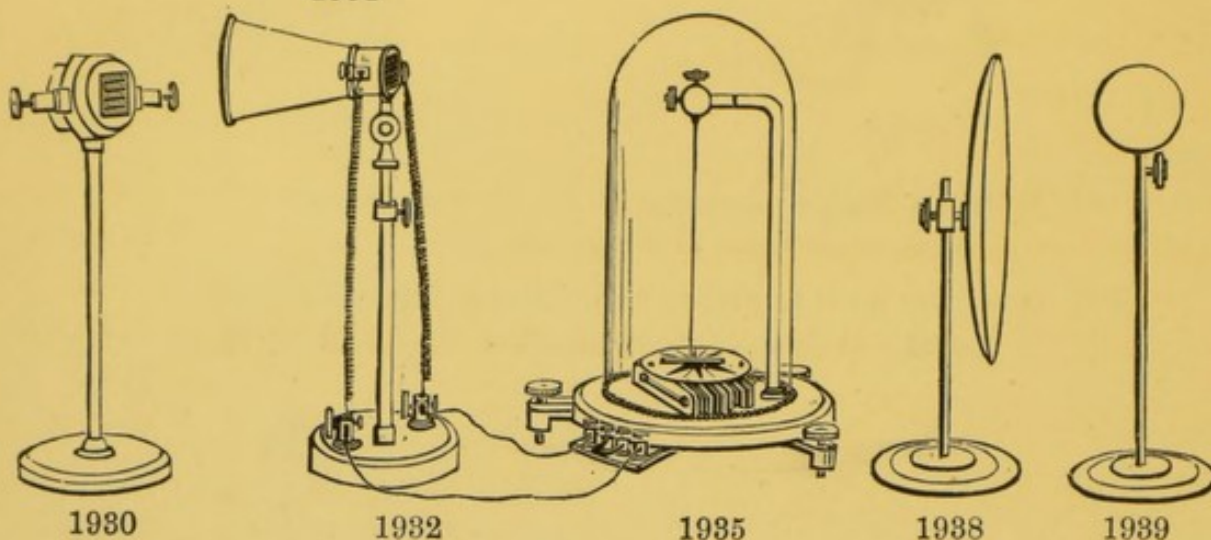


1904

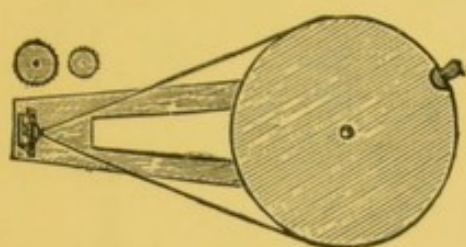
1096	1903	Ferguson's Pyrometer to show the expansion of different metal bars, with brass graduated arc	£1 10/ and	£1 15 0
		Extra bars for ditto ...	... each	0 2 0
1097	1904	Fire Syringe, brass ...	...	0 5 6
1098	1905	Fusible Metal ...	... per oz.	0 1 0

Old Cat.No.								
1113A	1924	Ritchie's Apparatus for showing absorption and radiation of heat	...	...	...	...	...	£1 15 0
1114	1925	Wollaston's Cryophorus	...	...	...	...	...	0 2 6
1115	1926	Tyndall's Apparatus to show expansion	...	...	...	...	...	1 4 0
1116	1927	„ Heat Absorption Apparatus	...	...	...	...	...	1 12 6
1116A	1928	Model Thermometer, with flask, tube and scale attached	...	...	...	...	...	0 5 0
1116B	1929	Air Thermometer, consisting of flask, tube with bulb, and scale attached	...	...	...	...	...	0 4 6

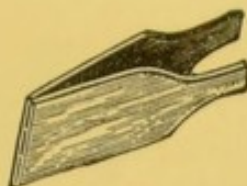
1934



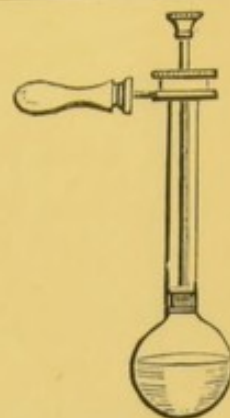
1117	1930	Thermopile, mounted on brass stand, 12 pairs	...	...	...	...	...	£0 17 3
1118	1931	„ „ „ 20 „	...	...	...	...	...	1 2 6
1119	1932	„ „ „ best, with joint, sliding tube and terminals on base, without cone, 40 pairs	...	...	...	...	...	2 5 0
1120	1933	„ „ „ 60 „	...	...	...	...	...	2 17 6
1121	1934	Cones for Thermopile	...	...	...	extra, each	...	0 5 0
1122	1935	Galvanometer, astatic needle, ebonite coil frame and adjustment for suspension	...	...	...	...	...	2 0 0
1123	1936	Galvanometer, best, moveable coil frame and double circuit	...	...	...	...	...	3 0 0
1124	1937	„ with silvered metal dial	...	...	...	extra	...	0 6 0
1125	1938	Reflectors, pair concave planished tin, diameter 15 inches, on stand	...	...	...	...	...	1 2 6
1126	1939	„ iron ball and stand for use with thermo-multiplier	...	...	...	...	...	0 5 6
1127	1940	Rumford's Thermoscope	...	...	...	...	...	0 12 6
1128	1941	Thermometer Tube	...	...	...	per lb.	...	0 2 0
1129	1942	„ „ with bulb	...	...	...	each	...	0 0 3
1130	1943	„ „ filled with mercury	...	...	...	„	...	0 0 6



1944



1945



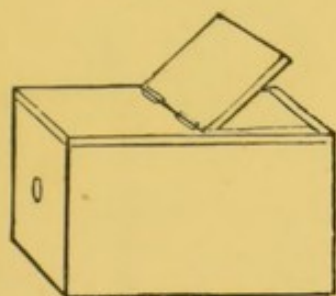
1946

Old Cat.No.	1131	1944	Wheel Multiplying, with metal cylinder	...	...	£1	12	6
	1132	1945	,, ,, oak boards for ditto	0	3	0

See also Mechanical Powers.

1133	1946	Wollaston's Steam Piston	0	5	6
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LIGHT EXPERIMENTS.



1947



1949



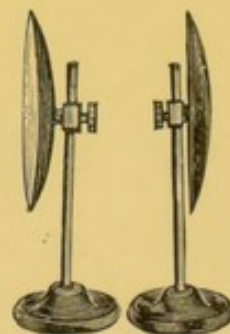
1950



1951

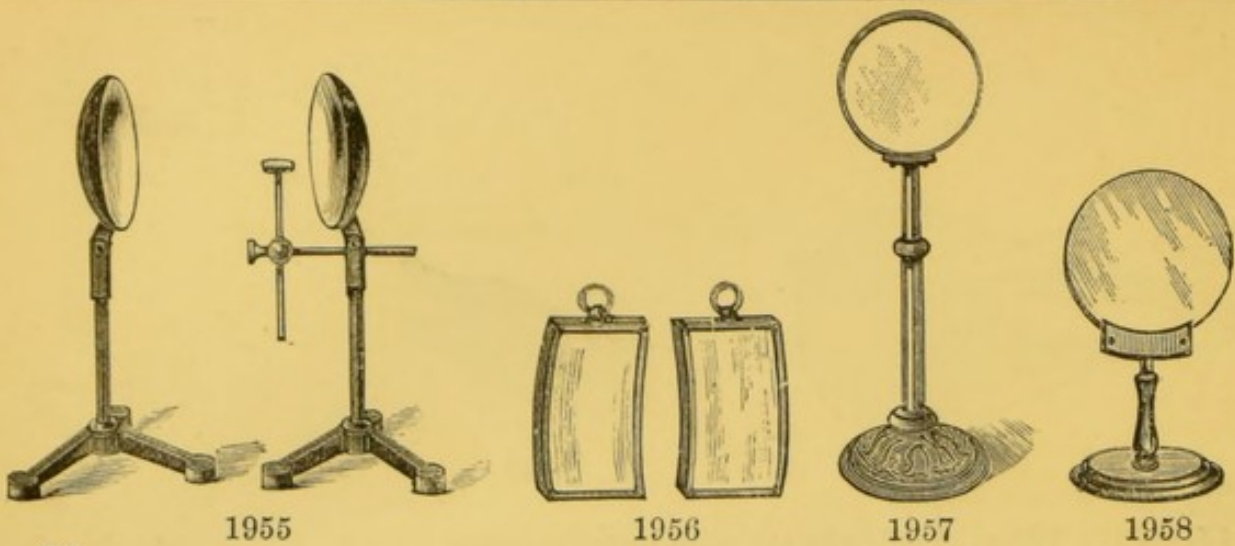


1952



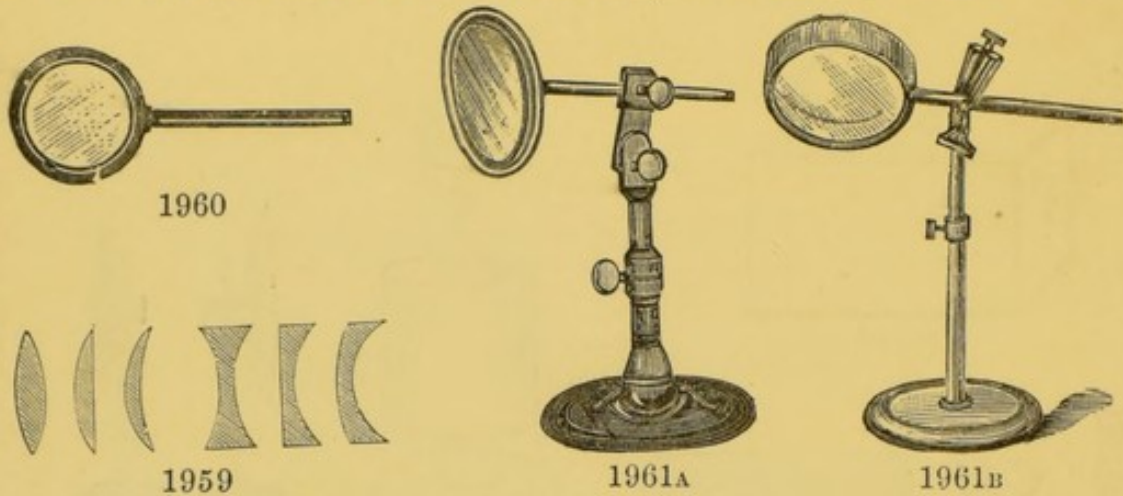
1953

1134	1947	Camera Obscura	£0	12	6
1134A	1948	,, Lucida	...	...	...	...	...	2	10	0
	1949	Cells, Glass, flat	...	...	...	...	per pair	0	6	0
	1950	,, ,, wedge shape	...	...	...	...	,,	0	9	0
	1951	,, ,, Trough, 5 divisions	...	...	...	...	each	0	7	0
1135	1952	Heliostat	...	...	...	...	...	3	15	0
1136	1953	Mirrors, Concave and Convex, glass, silvered, diam. 6 in., on stands, pair	...	...	...	...	...	0	12	6
1137	1954	,, ,, ,, ,, 9 in.	...	...	...	...	...	0	18	0



Old
Cat.No.

1137A	1955	Mirrors,	Concave, Copper, Silvered, best make, about 12 in. diam., with ball and sponge holder, on stand	... ..	per pair	£3 0 0
1137B	1956	„	Concave and Convex, 9 in. × 6 in., in black wood frame	... ..	per pair	1 15 0
1137c	1957	„	Sliding, Magnifying, 3 in. diam., on brass stand	... ..		0 18 6
1138	1958	Ground Glass Plate or Screen,	on mahogany stand	... ..		0 7 6



1139	1959	Lenses,	Set of 6 and 6 Half-Lenses	... ..		£1 1 0
1140	1960	„	Set of 4, 2½ in. diameter, mounted in wooden rings, with brass rods	... ..		0 17 6
1141	1961A	Universal Holder to support Lenses, &c., Polished Mahogany	... ..	... ..		0 6 6
	1961B	„	Iron Foot, Brass Rod, and Fittings		0 6 6



1962

1143	1962	Newton's Ring Apparatus		0 10 6
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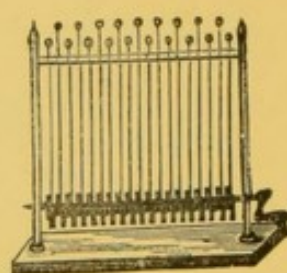
1973



1974



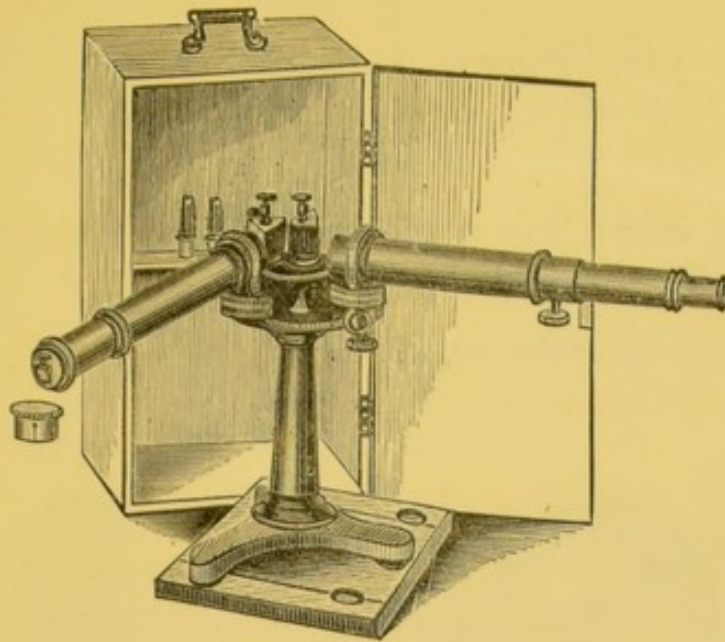
1975



1981

Old
Cat.No.

1150	1972	Plates of Coloured Glass, 4 in. × 3 in., 1 doz.	...	£0	4	0
1151	1973	Prism of Glass, with plane ends, 1 in. face—				
		Length 3 4 5 in.				
		1/ 1/6 2/6				
1152	1974	Glass Prism, mounted on brass stand, with brass rod, and ball and socket joint	...	...	...	0 12 0
1153	1975	Prismatic Bottle	...	...	10/ and	0 15 0
1154	1976	Triangular Prism, with plane ends, having angles 75°, 60°, and 45°, 1½ in. long	...	...	...	0 8 6
1155	1977	Right Angled Prism, 1 in.	...	..	...	0 8 0
1156	1978	Complementary Prisms of flint and crown glass	...			0 10 0
1157	1979	Nicols' Prism	...	...	7/6 to	1 1 0
1158	1980	Prism, with obtuse angle to show interference of light	...			0 5 0
1159	1981	Powell's Wave Apparatus	...	...	...	3 3 0
	1982	Reflector, Copper Plated, on Iron Stand, 9 in.	...	...		0 10 6
	1983	Sextant and Reflecting Circle, Model	...	...	...	0 6 0
	1984	Plates of Quartz, Aragonite, Calcite, Selenite and Nitre, per Set from				1 10 0
	1985	Rhombs, of Iceland Spar	...	...	each, 15/ to	1 10 0
	1986	Lantern, 4 in. Glass Condensers, with Newton's Patent Triple Wick Oil Lamp, in Black Wood Box	...	...		4 10 0



1897

SPECTROSCOPES.

Old Cat.No.					
1159A	1887	Spectroscope, miniature, pocket, with fixed slit ...	...	£1	15 0
1159B	1888	" " " adjustable slit ...	...	2	0 0
1159C	1889	" chemical, single prism, 1 in. prism, in polished mahogany case ...	...	5	0 0
1159D	1890	" " 1½ in. prism, extra dense glass, in polished mahogany case ...	...	6	10 0
1159F	1891	" " superior finish do. ...	...	8	15 0
1159G	1892	" " 2 prism, with 1¾ in. prism, divided circle, Vernier and Reader, in polished mahogany cabinet ...	...	20	0 0



1993



1994



1995

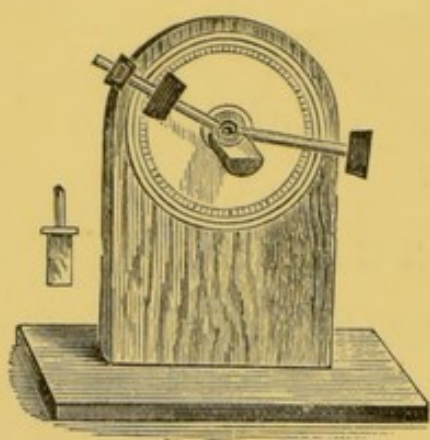


1996

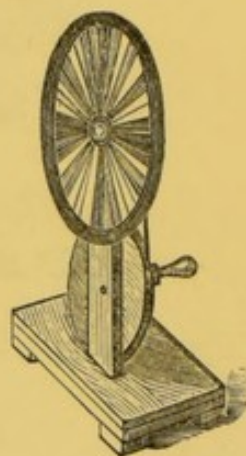
1160	1993	Radiometer, Crooke's	...	...	...	...	...	£0	5 0
1160A	1994	" " double	...	...	...	...	...	0	10 0

Old
Cat.No.

- 1160B 1995 **Tourmaline Forceps**, or Pincette, consisting of 2
Tourmalines mounted in 2 rings of silvered copper,
coiled to form a spring £0 17 6
- 1160c 1996 **Glass Prism**, to contain Indigo Solution for examination
of the colours of blowpipe flames 0 4 0
- 1997 **Tray**, Semicircular, 24 in. diam., 4 in. deep, with glass
window 0 10 0



1998

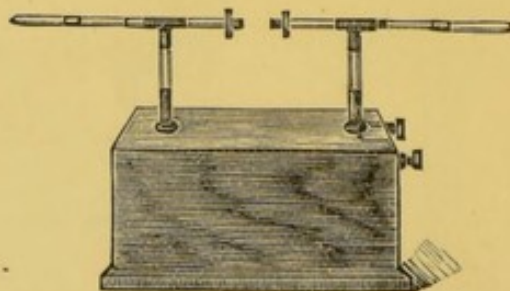


1999

- 1161 1998 **Apparatus for illustrating reflection and refraction
of Light**, a graduated circle on mahogany stand, with
two brass slides which move round the circumference,
semicylindrical vessel in the centre for water, with
mirrors and screens £1 5 0
- 1162 1999 **Newton's Disc**, on Mahogany Stand 1 10 6



2000



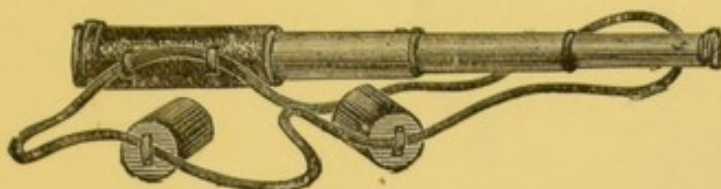
2002

- 1162A 2000 **Kallistochrome or Colour Top**, for illustrating the
beautiful automatic changes of colour, with 12 coloured
discs, glass support, mask, and wood handle £0 7 6

Old
Cat.No.

1163 2001 **Two Tin Plates**, mounted on stand to show absorption £0 4 0

1163A 2002 **Automatic Lamp**, for showing Spectra of Metals and Gases, with Electric Sparks 1 15 0



2003

TELESCOPES.

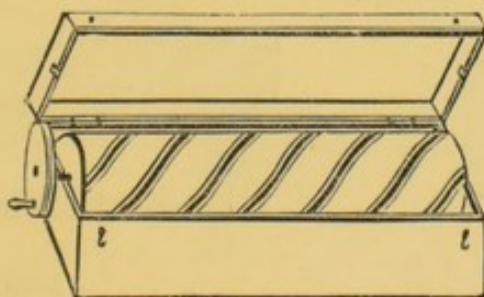
1163B 2003 **Telescope, Tourists'**, covered with hard, black-grained Leather, with Caps and Sling—

12 in.	3 draw closing to	6 in.	When open	15 in.	Diam.	1¼ in.	£1 5 0
18 "	3 "	"	8 "	"	23 "	1⅜ "	1 15 0
24 "	3 "	"	10 "	"	30 "	1⅝ shaded	3 0 0
30 "	4 "	"	11 "	"	36 "	2⅛ "	4 0 0

EXPERIMENTS WITH SOUND.

As recommended by the Educational Department, South Kensington Museum.

Alarum to be rung under exhausted receiver. (See Air Pumps, &c.)

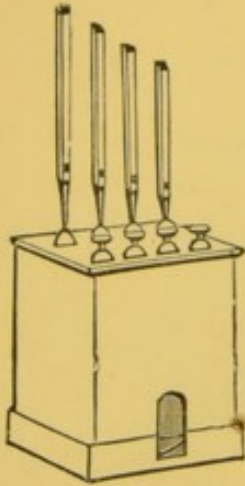


2004

1164 2004 **Apparatus to show the Transmission of Undulations—**
10/6 and £0 12 6

1165 2005 " " **Action of the Larynx** 0 7 6

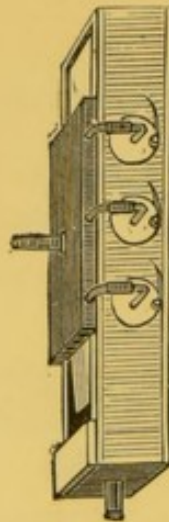
2006 **Box for Vortex Rings** 0 7 6



2007



2009



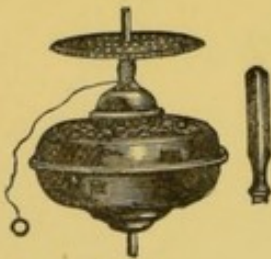
2010



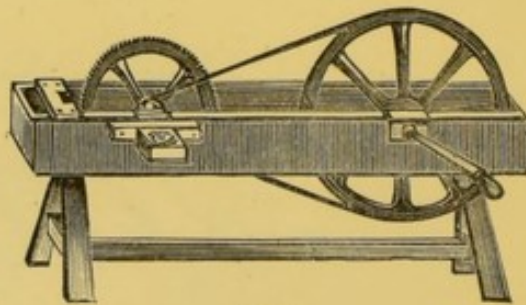
2015

Old
Cat.No.

1166	2007	Double Bellows and Set of 4 Organ Pipes, G to C, mounted on Swiss Pine and Varnished...	£6 0 0
1167	2008	„ „ complete Octave, superior construction	12 10 0
1167A	2009	Organ Pipe, simple, unpolished ... 8/6, 12/, 15/ and	1 0 0
		„ polished ... 10/6, 14/, 17/ and	1 2 0
1167B	2010	„ „ Polished White Wood, for illustrating Nodes and Loops	2 5 0
1167C	2011	„ „ with glass front	1 0 0
	2012	„ „ Set of 8, Swiss Pine, Complete Octave ...	3 0 0
	2013	Reed Pipes, with 2 Horns (Mama)	1 10 0
	2014	„ „ Spotted Metal, Oboe or Clarionet ... each	0 10 6
1168	2015	Hopkin's Forked Tube to show the interference of sound	0 6 0
1169	2016	Hydrogen Bottle to show the effect of a jet of gas burning in a tube	0 2 6
1170	2017	Glass Tubes of different lengths and diameters to be used with hydrogen jet	0 2 0



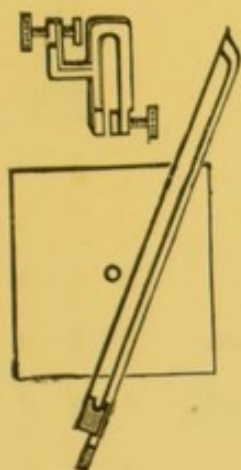
2018



2020

	2018	Humming Top, with Iron Plate pierced with two rows of holes and Toothed Edge	£0 6 0
	2019	Manometric Flame Apparatus Sounding Board ...	2 0 0
1171	2020	Savart's Toothed-Wheel Apparatus, with two wheels, fine and coarse, on polished Mahogany stand ...	2 10 0
1171A	2021	„ „ with Indicator	3 3 0

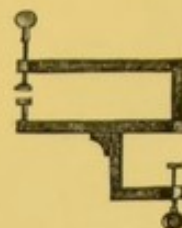
2022	Trough, Wood, with Glass Frame, 4 ft. × 6 in. × 6 in.	£0 12 0
2023	„ Zinc, circular, 24 in. × 18 in.	0 16 0
2024	„ „ 18 × 18 in.	0 12 0
2025	„ „ 24 × 12 × 18 in.	0 18 6
2026	Wooden Block for above $5\frac{3}{4}$ × 4 × 4 in. with handle ...	0 2 0



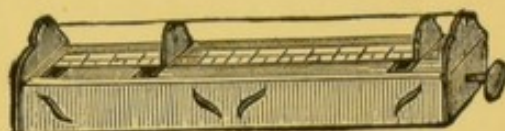
2027



2031



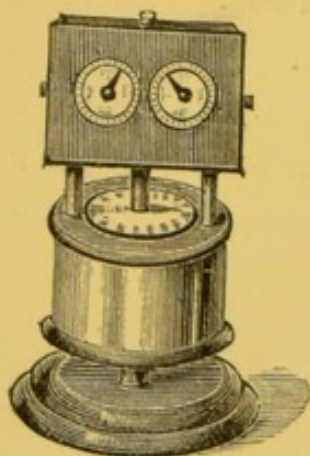
2030



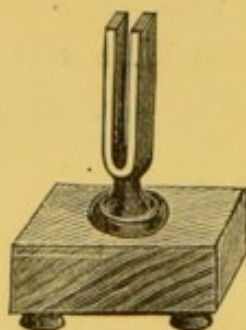
2032

Old
Cat.No.

1172	2027	Clamp with Brass Plate and Bow to show Chladnis figures	£0 16 6
1172A	2028	10 Glass Plates, different forms for above	0 15 0
1173	2029	Clamp and Glass Plates with bell-metal clamp ...	1 5 0
	2030	„ „ „ iron clamp	0 18 6
1174	2031	Cylinder, with moveable piston, to show the effect of sounding boxes in increasing the intensity of sound	0 7 6
1175	2032	Monochord, with two wires, one stretched by a weight, the other by a screw—white wood	1 1 0
1176	2033	„ superior, mounted on legs, with key, and metre scale—mahogany	2 2 0
	2034	Iron Weights, Set of 4, with ring handle, consisting of one 20 lb. and three 10 lb.	0 15 0
	2035	Sounding Board, Deal, 24 in. × 24 in.	0 4 6
	2036	Deal Rod, 12 ft. × 1 in. × 1 in.	0 2 0
	2037	„ 12 ft. × 1 in. × $\frac{1}{2}$ in.	0 1 9
	2038	„ round, 6 ft. by $\frac{1}{2}$ in.	0 1 0
	2039	Oak Rod, „ 6 ft. by $\frac{1}{2}$ in.	0 1 6
	2040	Brass Tube, 3 ft. × $\frac{1}{2}$ in.	0 1 6



2041



2046



2053

Old
Cat.No.

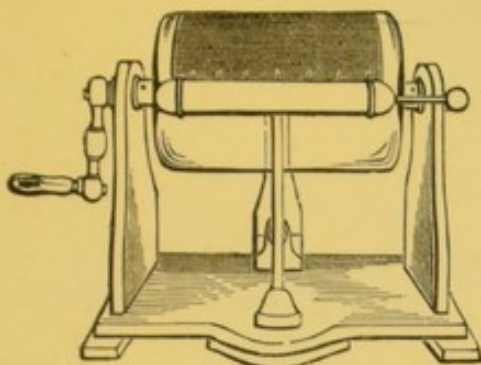
1177	2041	Syren, with indicator for number of revolutions	£2 10 0
	2042	Tin Tubes, 36 in. × 4 in. each	0 3 0
1178	2243	Tuning Fork Simple 1/, 2/6, 4/6 and	0 6 6
1179	2044	Two Tuning Forks of different pitch	0 7 0
1180	2045	„ „ „ mounted 15/ to	2 2 0
1181	2046	„ „ „ in unison with small mirrors attached, mounted	0 16 0
	2047	Tuning Fork, mounted on sounding board ... 6/ to	2 0 0
	2048	„ „ large, C, 64 vibrations	2 0 0
	2049	„ „ untuned	1 5 0
	2050	„ „ Set of 13, Chromatic, C to C, in case ...	1 10 0
	2051	Tonometer, consisting of 65 Forks, commencing at 256 and ending at 512	15 10 0
	2052	Leather Case for ditto extra	3 0 0
1182	2053	Speaking Trumpet, japanned tin	0 3 6



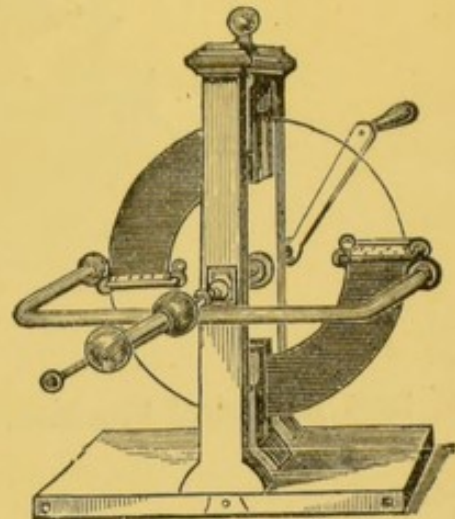
2054

1182A	2054	Trevelyan's Rockers, with lead block	1 10 0
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ELECTRICAL APPARATUS.



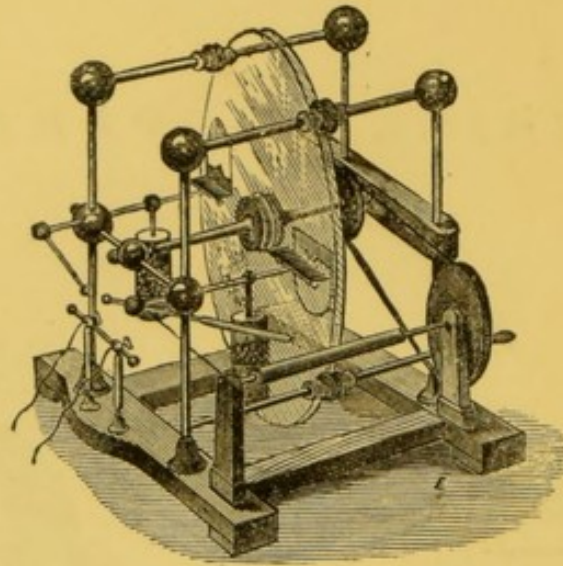
2055



2058

Old
Cat.No.

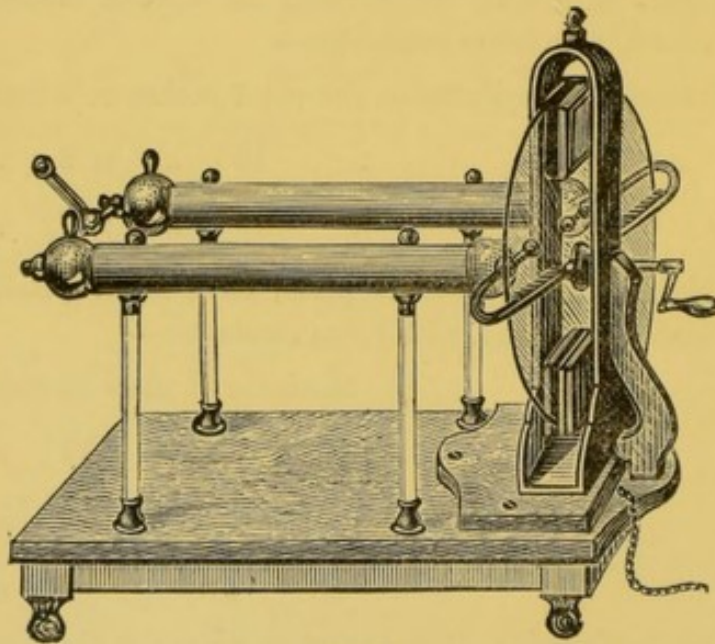
1183	2055	Electrical Machine , cylindrical, on French Polished Stand, with brass conductor—			
		Dimensions of cylinder on the rub 7 inches × 5 inches	£1	1	0
1184	2056	„ „ „ 10 „ × 6 „	1	8	6
1185	2057	„ „ „ 11 „ × 7 „	1	15	0
1186	2058	Electrical Machine , stout plate, on French polished mahogany stand, with brass conductor—			
		Diameter of plate 12 inches	2	15	0
1187	2059	„ „ „ „ 15 „	3	15	0
1188	2060	„ „ „ „ 18 „	4	15	0
1189	2061	„ „ „ „ 24 „	10	0	0
1190	2062	Electrical Machine , Bertsche, with vulcanite plate—			
		Diameter 10 inches	5	5	0
1191	2063	„ „ „ „ 12 „	6	6	0
1192	2064	„ „ „ „ 15 „	8	8	0



2065

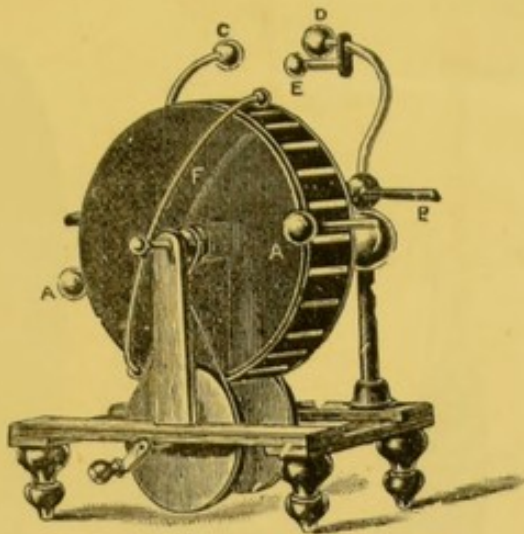
Old
Cat.No.

1193	2065	Electrical Machine, Holtz, with two glass circular plates—							
						Diameter 15 inches	£7	10	0
1194	2066	„	„	„	„	18 „	10	10	0
1195	2067	„	„	„	vulcanite plate	15 „	6	0	0



2068

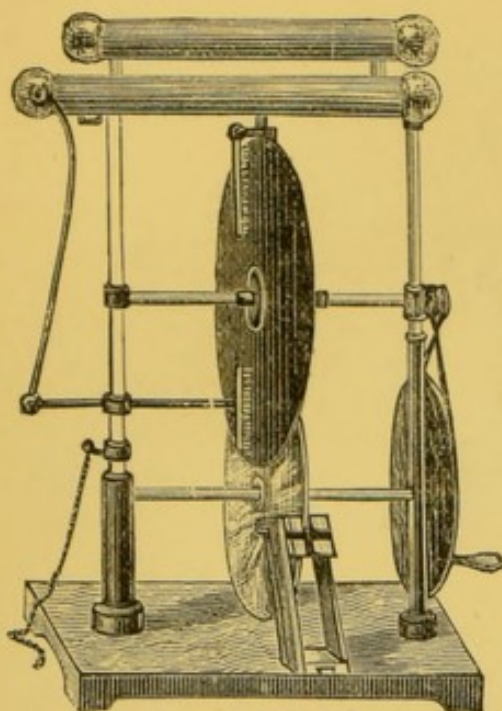
1195A	2068	Electrical Machine, Ramsden's, on Mahogany stand,							
						with 2 Brass Conductors, diameter of plate 18 inches	£5	0	0



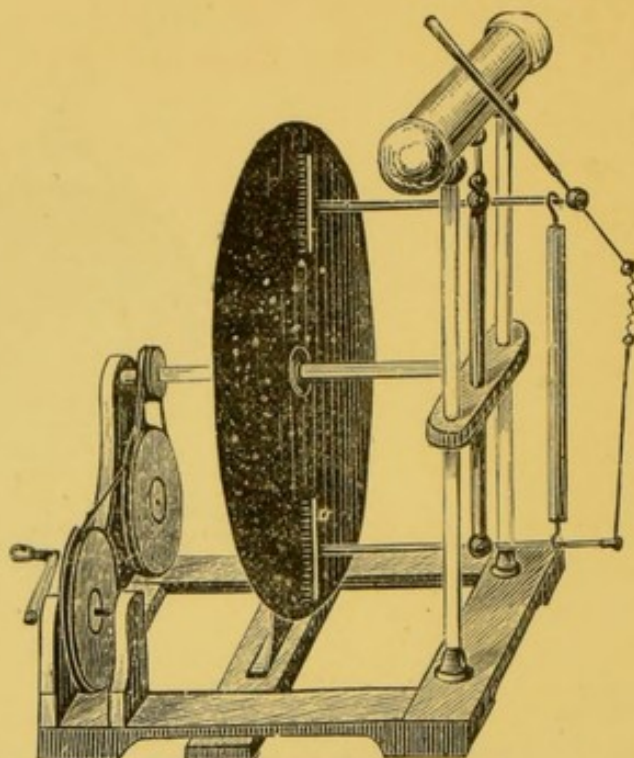
2070

Old
Cat.No.

2069	Electrical Machine, Vulcanite.	The great advantage in these machines is that they can be used in damp weather, which does not affect them in the same manner as the glass cylinders or plates—			
		Plate 6 in. diam., giving spark $\frac{1}{2}$ in. to 1 in.	£0	15	0
2070	„ Double Cylinder „ 6 $\frac{1}{2}$ „ „	1 in. to 2 in.	2	10	0
2071	„ „ „ 9 „ „	2 in. to 4 in.	4	10	0
2072	„ Wimshurst, consisting of two circular discs of glass, rotating in opposite directions, driven by cord or belt from pulley. The conductors consist of two forks furnished with collecting combs, supported on ebonite pillars, or on the Leyden Jars. Diameter of Plates 17 in., giving spark about 4 in. Fitted on mahogany stand, with pulleys and bosses complete	... ..	4	4	0
2073	Glass Plates, drilled hole in centre	... per pair	0	3	6
2074	„ with ground edges	... .. „	0	5	6
2075	„ fitted with sectors of tin foil and varnished	per pair	1	0	0
2076	Leyden Jars, special form 8 in. \times 1 $\frac{3}{4}$ in., set of 4	... ..	0	12	0
2077	Wire Brushes	... .. per doz.	0	2	0



2078



2079

Old
Cat.No.

1195B 2078 **Electrical Machine**, Carre's, on polished mahogany stand, Brass Conductors, and 2 Vulcanite Plates—

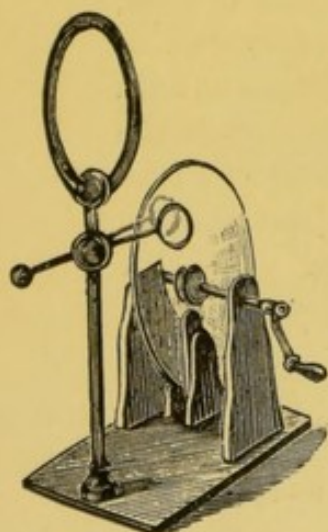
Diameter 12 and 18 inches £12 0 0

1195c 2079 „ Bertsch's, a more simple form of Holtz, but less powerful, with Vulcanite Plate, diameter 12 inches

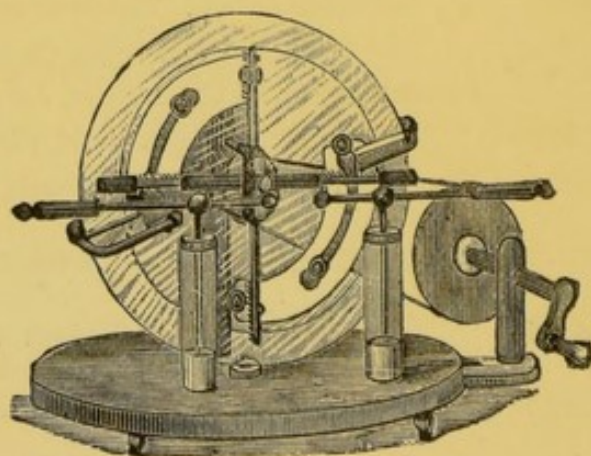
6 0 0

2080 „ „ „ „ 15 „

8 0 0



2081



2087

1196 2081 **Electrical Machine**, Winter's, on polished mahogany stand—

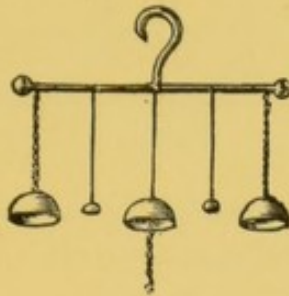
Diameter of Plate, 12 inches £3 15 0

Old
Cat.No.

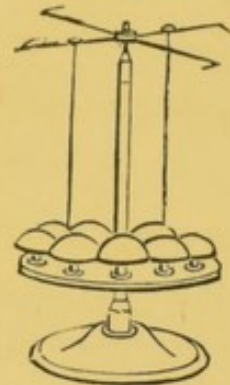
1197	2082	Electrical Machine, Winter's, on polished mahogany stand,						
					diameter of plate 15 inches	£5	0	0
1198	2083	"	"	"	"	18	"	6 15 0
1199	2084	"	"	"	vulcanite plates	12	"	4 10 0
1200	2085	"	"	"	"	15	"	5 15 0
1201	2086	"	"	"	"	18	"	7 10 0
1201A	2087	"	"	Voss', ordinary make, with 2 plates —				
		Size of Fixed Plate	11	14	17	20 inches		
		Length of Spark ...	3	4	5	6½ inches		
			£3 3/	£4 4/	£6	£7 10/		
1202	2088	Electrical Amalgam ...	...	...	...	per oz.	0	0 6



2089

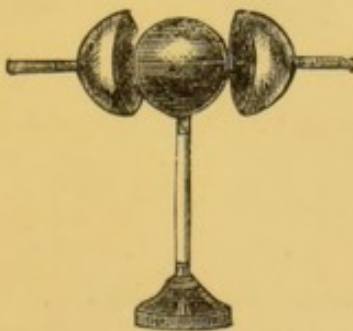


2090



2092

1203	2089	Aurora Flask, with brass cap and valve for exhaustion ...	£0	7	6
1204	2090	Bells, Set of 3, with rod to suspend from Conductor ...	0	5	6
1205	2091	" " 5, on stand, with electrical fly or wheel ...	0	15	0
1206	2092	" " 8, " " " " " " ...	1	10	0
	2093	" " 8, " gamut tuned	2	2	0



2094



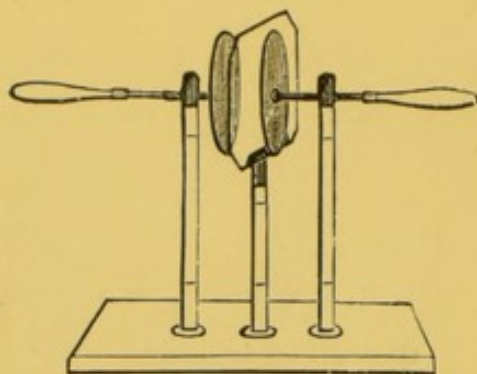
2097



2098

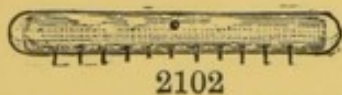
1207	2094	Biot's Apparatus, for illustrating the distribution of electricity on the surface of insulated conducting bodies, consisting of polished Copper Ball 4½ in. diameter, on insulated stand, with 2 Spheres 5 in. diam., and insulated handles	£1	12	6
------	------	--	----	----	---

Old Cat.No.		$\frac{1}{8}$	$\frac{1}{4}$	$\frac{5}{8}$	$\frac{3}{4}$	$\frac{7}{8}$	1	$1\frac{1}{8}$	$1\frac{1}{4}$ in. diam.
1208	2095 Brass Balls	3d.	4d.	4d.	5d.	5d.	6d.	10d.	1/3 each
1209	2096 „ „ with collar and wire for Leyden jar								£0 1 6
1210	2097 Bird on Stand, formed with spangles of tin foil								0 5 6
1211	2098 Bucket and Syphon to suspend from conductor								0 3 6
1212	2099 Cat Skins	...	...	...	...	Each	3/6, 5/, and		0 7 6
1213	2100 Chain, Brass	...	...	...	...			per yard	0 0 4



2101

1215 2101 Condenser, two brass discs and glass plate on mahogany stand with sliding movement 1 0 0



2102



2111



2103



2104



2105

1216 2102 Conductors, Brass, for cylinder machines—

6	7	8	9	10 in.
3/6	4/6	6/	7/	8/6 each

1217 to 1219, 2103 to 2105 Conductors, 3 different forms, tin foil, without stand, each £0 3 6

1217A 2106 Conductors, polished brass, glass insulated support, and iron stand—Spherical 0 12 6

1218A 2107 „ „ „ „ Cylindrical 0 15 0

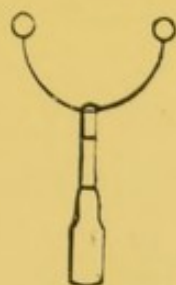
1219A 2108 „ „ „ „ Conical ... 0 17 6

Old
Cat.No. 1220 2109 Stand for Tin Foil Conductors... .. each £0 3 0

1220A 2110 Cork Figures, to attract and repel each 0 1 6

1221 2111 Cylinders, Glass, for Machines, dimensions on the rub—

Length	6	6½	7	8	10	11 inches
Diam.	3½	4	5	5½	6	7 inches
	1/8	2/6	3/	3/6	4/6	6/ each



2112



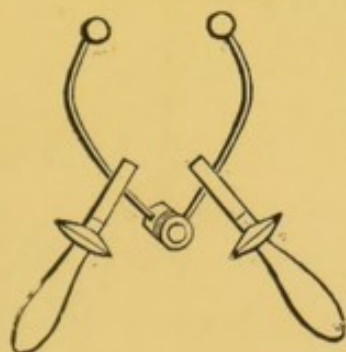
2113

1222 2112 Discharger, plain, with wood handle £0 2 0

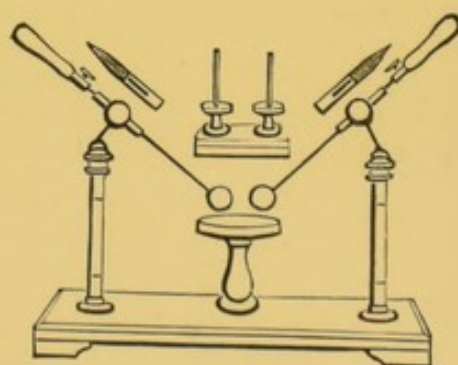
1223 2113 „ jointed „ „ 0 5 0



2114



2115

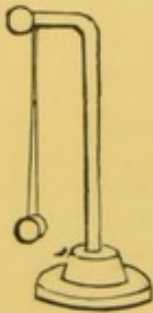


2116

1224 2114 Discharger, jointed, with glass handle £0 6 6

1225 2115 „ with two handles 0 10 6

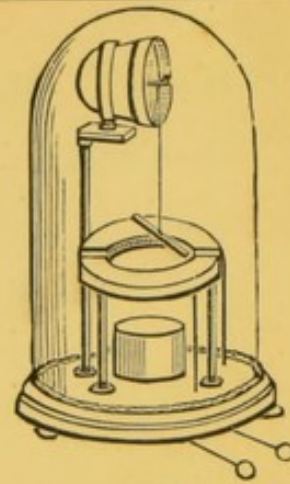
1226 2116 „ Henley's Universal, with press, table and carbon holder, for deflagrating metals or exposing substances to frictional or voltaic electricity ... 1 10 0



2117



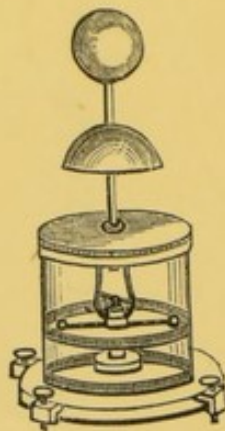
2119



2120



2118



2121

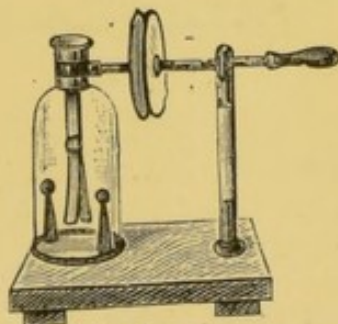


2123

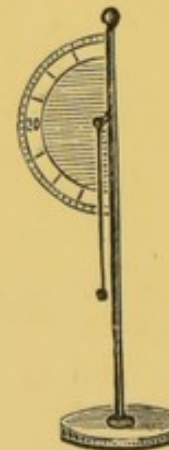


2124

Old Cat.No.									
1227	2117	Electrometer, Pith Ball, Tate's ...	...	...	...	...	...	£0	1 3
1227A	2118	" " Cavallo's	...	...	...	...	...	0	14 0
1228	2119	" Coulomb's Torsion Balance	...	...	...	...	...	3	15 0
1229	2120	" Thompson's	...	...	...	...	...	6	6 0
1230	2121	" Peltier's	...	...	...	...	...	5	0 0
1231	2122	" Saussure's	...	...	...	...	...	0	16 6
1232	2123	" Lane's	...	...	...	...	...	0	5 6
1233	2124	" Gold Leaf	...	...	...	...	...	0	10 6



2125

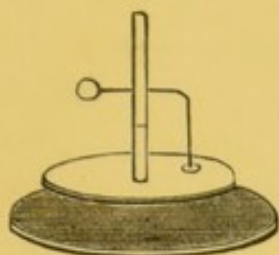


2127

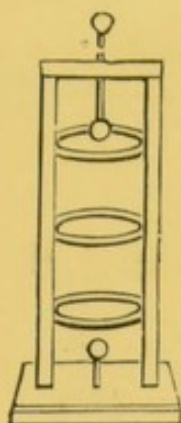
1234	2125	Electrometer, Gold Leaf, with condenser, moveable	...	...	...	...	...	£0	16 0
1235	2126	" " " sliding condenser	...	...	...	...	...	0	12 6

Old
Cat.No.

1236	2127	Electrometer, Quadrant, Henley's, with graduated arc, 4/ &	£0	7	6
1236A	2128	„ with Bohnenberger's dry pile	3	10	0



2129

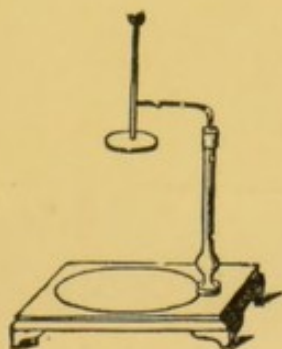


2131



2134

1237	2129	Electrophorus, with vulcanite disc, about 8 in. and 10 in.,	10/ &	£0	15	0
1237A	2130	„ Resin, 10 in. plate, brass cover, and glass handle	0	8	0	
1238	2131	Egg Stand—mahogany	0	5	6	
1239	2132	„ with brass bronzed fittings	0	10	6	
1240	2133	„ with reflector... ..	0	16	0	
1241	2134	Faraday's Butterfly Net, with stand	0	4	6	

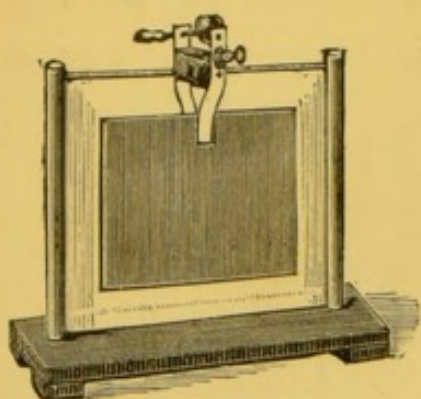


2135

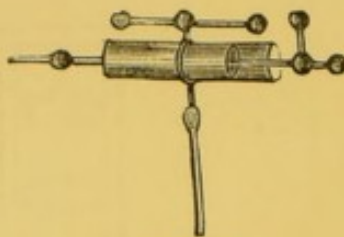


2136

1242	2135	Figure Plate, on mahogany stand, with sliding rod ...	£0	6	6	
1243	2136	„ brass	5/6 &	0	7	6



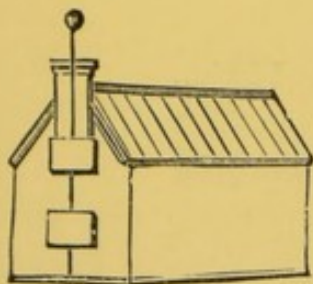
2187



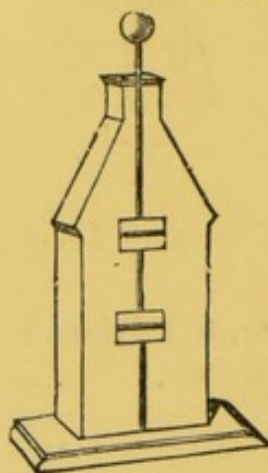
2189



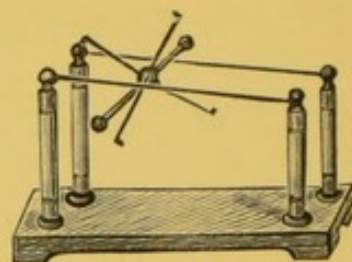
2140



2141

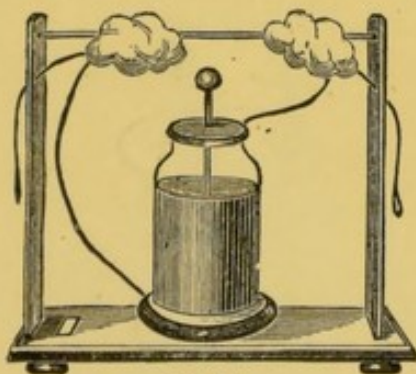


2148

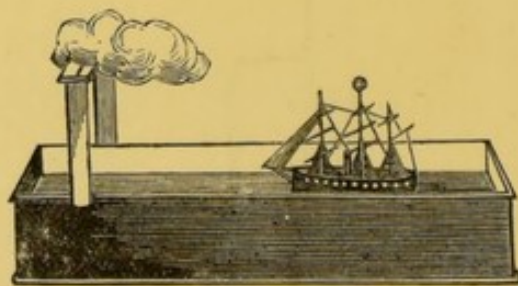


2148

Old Cat.No.	2141	2148	2148				
1244	2187 Fulminating Plate...	...	...	...	...	...	£0 16 0
	2188 " " with Silk Handle	...	...	...	...	...	0 4 6
1245	2189 Harris' Unit Jar	...	...	...	...	...	0 16 0
1246	2140 Head of Hair	...	...	...	...	3/ &	0 5 0
1247	2141 House, Fire ...	...	...	...	...	...	1 2 6
1248	2142 " Powder	...	...	...	...	...	1 5 0
1249	2148 " Thunder	...	...	...	...	...	0 6 6



2145

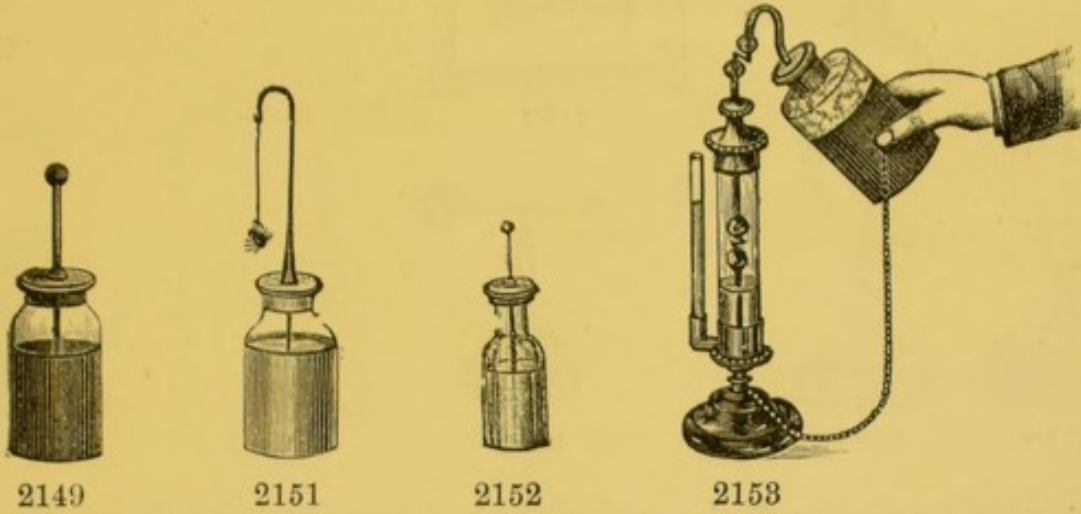


2146

1249A	2145	Apparatus for explaining the theory of the Thunder Cloud	...	...	...	...	£1 12 6
1249B	2146	" for illustrating the effect of Electric discharge on mast of a vessel	...	...	...	...	1 5 0

Old
Cat.No.

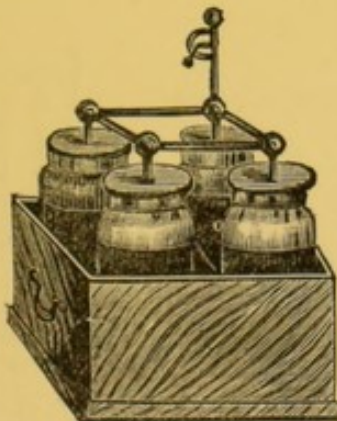
1249c	2147	Fox's Brush	...	...	...	...	...	...	£0 3 6
1250	2148	Inclined Plane	...	...	...	...	...	...	0 16 0



1251 2149 Leyden Jar, mounted, with polished mahogany top, brass rod, &c.—
 $\frac{1}{2}$ 1 $1\frac{1}{2}$ pints 1 quart 2 quarts

2/6 3/6 4/ 5/ 9/6

1251A	2150	„	mounted with Lane's discharging electrometer	...	...	...	...	£0 12 6
1251B	2151	„	mounted with spider	...	...	...	...	0 10 0
1251c	2152	„	Varley's, coated with Platinum	...	...	...	...	0 7 6
1251D	2153	Kinnersley's Thermometer,	for showing atmospheric disturbance by Electric Spark	...	...	...	...	0 12 6



2154

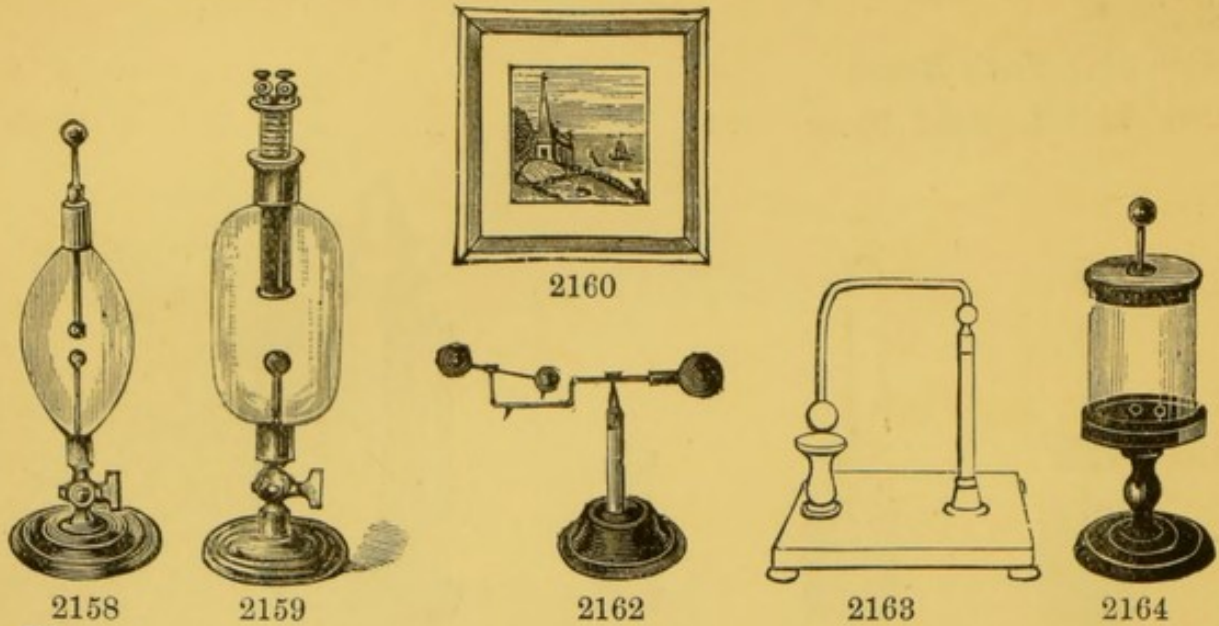


2156

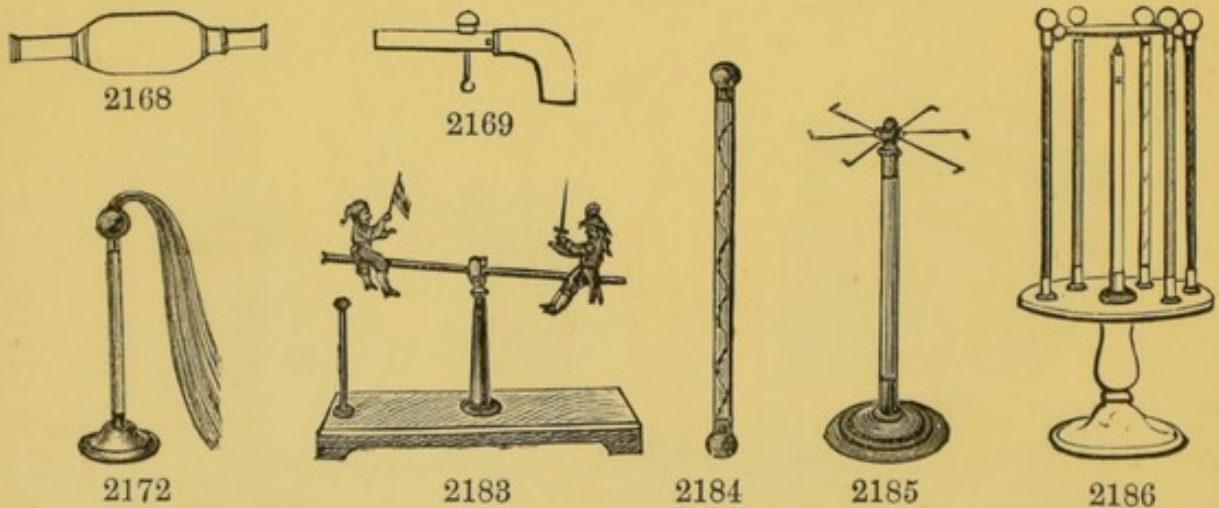


2157

1252	2154	Leyden Jar, Battery of 4, 2 pints in mahogany tray	...	...	...	...	...	£1 5 0
1253	2155	„ „ „ 6, „ „ „	...	...	...	...	...	1 17 6
1254	2156	„ „ with moveable coatings	...	...	1 pint	...	...	0 7 6
					2 „	...	...	0 9 0
1255	2157	Jar, diamond	...	...	1 „	...	...	0 6 0
					2 „	...	...	0 8 6



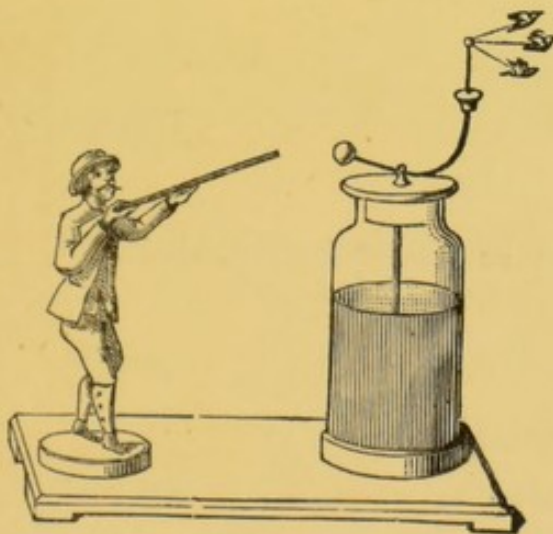
Old Cat.No.		Description	Price
1256	2158	Luminous Globe, with stopcock, sliding wire, and forceps	£2 0 0
1256A	2159	,, ,, to show the Rotation of Current round Magnet in Vacuo	3 0 0
1257	2160	Magic Picture	0 6 0
1258	2161	Mosaic, Gold ... per oz.	0 1 0
1259	2162	Orrery	0 4 0
1260	2163	Phosphorus, or Spirit Cup...	0 10 6
1261	2164	Pith Ball Stand	0 4 0
1262	2165	,, Balls ... per doz.	0 0 4
1263	2166	,, Figures ... each	0 0 9
	2167	,, Rods, in Bundle containing ... 1 doz.	0 0 6



1264	2168	Gas Cannon ...	£0 12 6
1265	2169	Pistol	0 4 6
1265A	2170	Planes, painted	0 14 0
1265B	2171	Proof, for use with metallic roller	0 1 3
1265C	2172	Plume Glass...	0 5 0

Old
Cat.No.

1266	2173	Plates, Glass, for machines :—	9	12	15	18	24 in. diameter			
			6/6	9/	14/	20/	33/ each			
1267	2174	Plates, Vulcanite—	12	15	18	24 in. diameter				
			18/	18/6	30/	50/ each, $\frac{1}{4}$ in. thick				
			20/	30/	40/	70/ ,, $\frac{3}{8}$ in. thick				
1268	2175	Rod Glass for pillars	...	...	...	...	per lb.	£0	1	0
1269	2176	„ „ one half roughened	...	...	...	...	...	0	2	6
	2177	„ Brass, rounded ends	...	...	...	...	...	0	2	0
	2178	„ Sealing Wax	...	...	...	...	...	0	1	6
1270	2179	„ Shellac	...	...	...	...	...	0	1	6
1271	2180	„ Sulphur	...	...	...	...	...	0	2	6
1272	2181	„ Vulcanite	...	...	...	...	...	0	1	6
	2182	„ half Brass and half Glass	...	...	...	...	...	0	2	6
1273	2183	See Saw	...	...	...	...	...	0	12	0
1274	2184	Spiral Hand	...	...	...	...	...	0	2	6
1275	2185	„ Revolving, on stand	...	...	...	...	...	0	10	6
1276	2186	„ „ set of 5 spirals, best coloured glass tubes, with brass caps, on polished mahogany stand	...	...	...	...	...	1	12	6
1277	2187	Silk, unspun	...	...	...	...	per skein	0	0	4

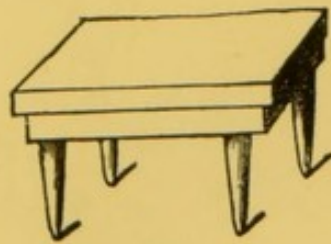


2188

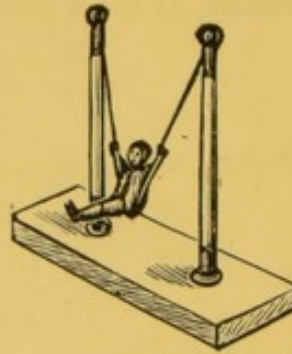


2189

1278	2188	Sportsman, on mahogany stand	...	...	...	...	£1	0	0
1279	2189	Stand, Insulating	...	...	...	...	0	6	0
		„ „ sliding rod	...	...	...	...	0	7	6



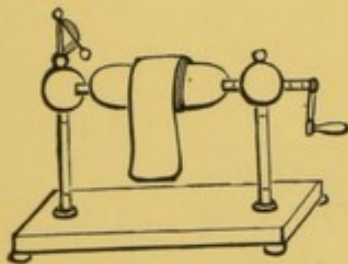
2190



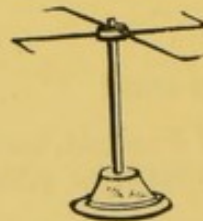
2192

Old
Cat.No.

1280	2190	Stool, Insulated, Black Wood	...	...	...	...	£0 7 6
		" " Mahogany	...	...	...	...	0 12 6
1281	2191	" Legs Glass, Set of 4	...	...	...	...	0 4 0
1282	2192	Swing	...	...	...	...	0 12 6



2194



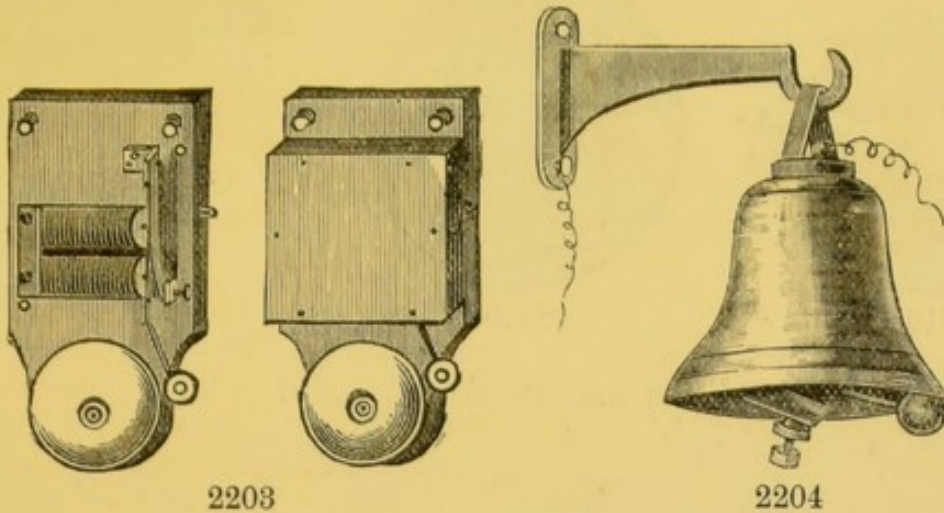
2195



2202

1283	2193	Tin Foil	...	...	...	per lb. 1/6 and	£0 2 6
1284	2194	" Roll on Support	...	...	...	12/6 and	1 0 0
1285	2195	Whirl	...	...	...	...	0 2 6
1285A	2196	Wire Gauze Cylinder, on insulated stand, similar to Biot's Apparatus	...	...	...	...	0 8 6
	2197	Amalgam, Electrical	...	...	...	per oz.	0 0 6
	2198	Aurum Musivum (Mosaic Gold)	...	...	...	"	0 1 0
	2199	Copper Leaf (Dutch Metal)	...	...	...	per book	0 0 2
	2200	Gold Leaf	...	...	...	"	0 2 0
1286	2201	Wood Caps and Handle for Cylinder, the Set...	...	...	...	...	0 2 6
1287	2202	Words, Fire or Light, arranged on glass with pieces of tin foil, in mahogany frame	...	...	...	...	0 6 6

GALVANIC APPARATUS.



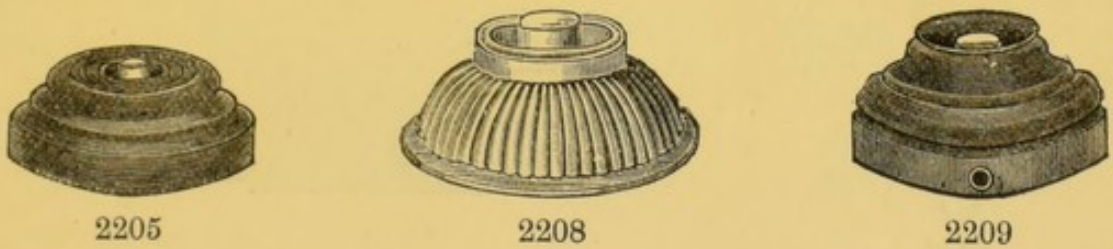
Old
Cat.No.
1288

2203 Alarm or Electric House Bell, on polished mahogany frame and cover, suitable for offices or domestic use, best Nickel Bell—

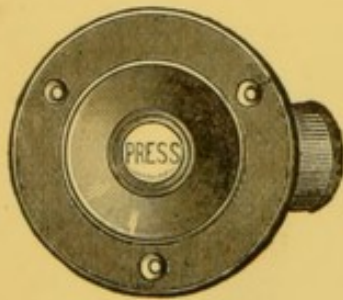
2¾	3	3½	4	4½ inches
5/6	6/3	7/6	10/	13/ each

2204 Bracket Electric Bell, including Bracket—

3½	4½	5	6 inches
7/6	10/	12/6	19/ each



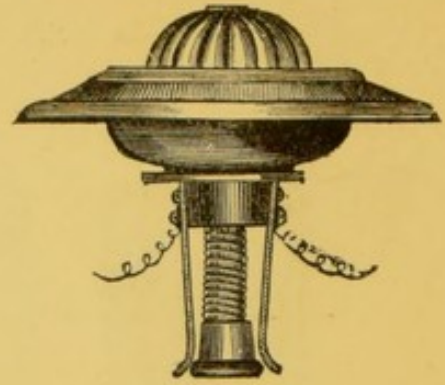
2205	Bell Pushes to be used with the above, Stained Wood,	1¾ in. diam.	each	£0 0 6
2206	„	Boxwood or Ebonized, 2 in. diameter ...	...	0 0 8
		2½ „	...	0 0 9
2207	„	best Woods—		
		2	2½	3 inches
		9d.	1/	1/2 each
2208	„	with double Platinum Contact Springs,		
		3 inch	1/4 and	£0 1 6
2209	„	Wall Rosette	each 1/ and	0 1 6



2210



2210



2211

Old
Cat.No.

2210 Presses, Front or Side Door—

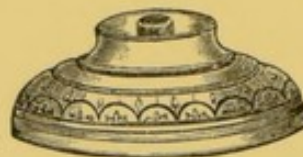
2½	3	3½	4 inch
1/6	1/9	2/3	2/9 each

2211 Barrel Pushes, for Front Door—

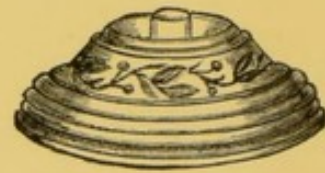
1½	2	2½	3	4 inch
3/9	4/	5/9	6/6	8/6 each



2212



2217

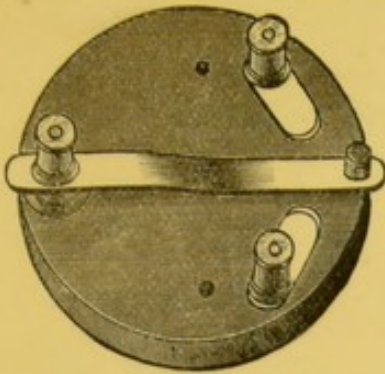


2217

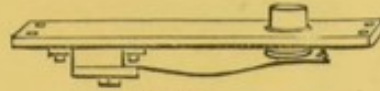


2218

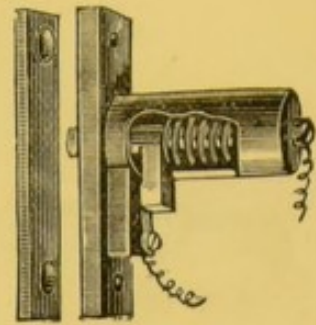
1289A	2212	Bell Pushes, pear shape, small	...	...	...	...	£0	1	3
	2213	" " with ivory fittings	...	...	...	...	0	1	6
1289C	2214	" for Invalids	...	...	...	...	0	1	3
1289D	2215	Pulls, front door, round or square, plain, visitors or servants—							
			4	4½	5	5½ inch			
			7/6	8/6	9/6	11/6 each			
	2216	Push and Pull combined, Patent...	...	...	...	...	£0	4	6
1290	2217	Bell Pushes, china, white or black, with gold lines, 1/6, 1/9 &	...	...	...	...	0	2	0
1291	2218	Indicator, for 4 calls, on polished mahogany or walnut frame, with glass front	...	...	...	...	1	10	0
	2219	" for 6 calls	...	...	...	...	2	0	0
	2220	" for 8 calls	...	...	...	...	2	15	0



2221



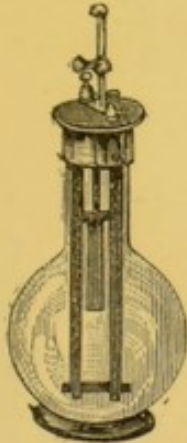
2222



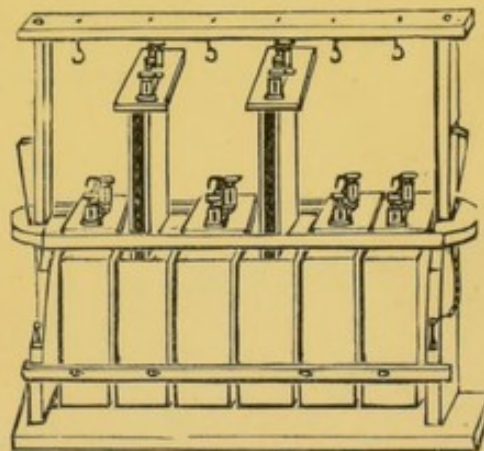
2224

Old
Cat.No.

1292	2221	Switch to change the direction of the current, &c.	1 way	£0 1 9
			2 „	0 2 6
			3 „	0 2 9
1293	2222	Thief Detector, to attach to doors or windows ...	...	0 3 6
1293A	2223	„ folding doors ...	...	0 3 6
	2224	Burglar Alarm, ebonite ...	...	0 1 9
	2225	„ best brass... ..	...	0 2 3
	2226	„ best barrel ... ..	...	0 3 0
	2227	„ floor contact ... ..	...	0 3 6
	2228	„ door trigger ... ..	...	0 2 6



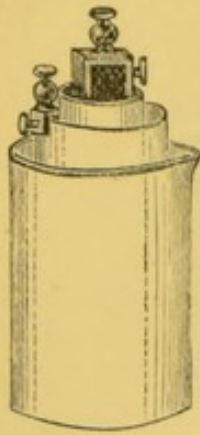
2229



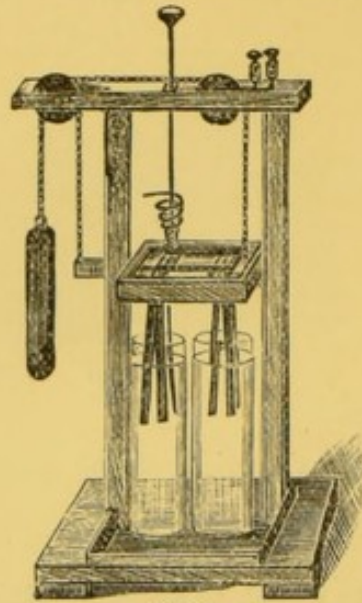
2231

BATTERIES.

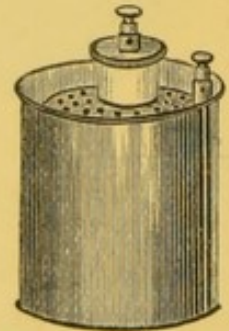
1294	2229	Battery, Bichromate, bottle shape—				
			Capacity $\frac{1}{4}$	$\frac{1}{2}$	1	2 litres
			3/6	5/	7/	10/
1294A	2230	Battery, Bichromate, bottle shape, 2 quarts, with 2 zincs and 3 carbons ... ..	...	...	...	£1 1 0
1295	2231	Battery, Bichromate, set of 6 glass cells in mahogany frame, with arrangement for suspending one or all the zincs and carbons when not required for use. It is sufficiently powerful to heat platinum wire, show the electric light and decompose water. Ebonite covers, with brass screws, hooks and connections, complete ...				1 17 6



2232



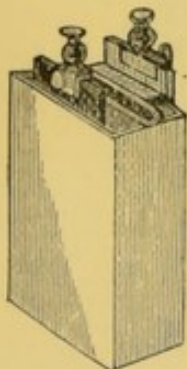
2233



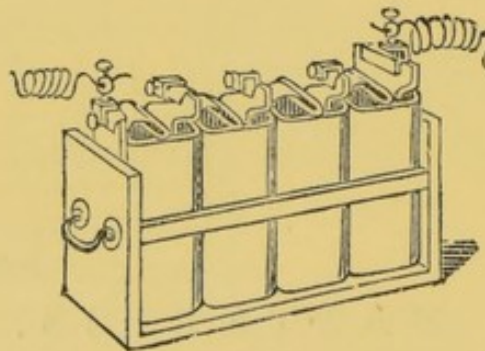
2234

Old
Cat.No.

1296	2232	Battery, Bunsen's outer cell brown stoneware—capacity		
		1½ pint, size of carbon 7 × 1 × 1	... ..	£0 4 0
		2 „ „ „ „ „ „ „ „ „ „	... ..	0 6 0
1297	2233	„ Bunsen's Bichromate, on oak stand, with pulleys and weights complete. 4 glass cells		
		14 × 4 in., carbon plates 9½ × 2 × ½ in.	... ..	3 10 0
1298	2234	„ Daniell's outer copper cell, 4¾ × 4½ in.	... ..	0 5 0
		9½ × 4½ in.	... ..	0 6 6



2235



2236



2240

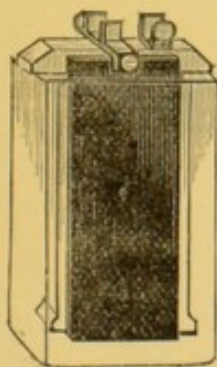
1299	2235	Battery, Grove's, in glass or white stoneware cell, platinum plate 5½ × 2 in., outer cell 4¾ × 3¼ × 1¾ in.	... ..	£0 9 0
1300	2236	„ Grove's, set of 4, in mahogany tray	... ..	1 16 0
1301	2237	„ „ set of 6 „ „	... ..	2 12 0
1301A	2238	„ „ stoneware, outer cell 6½ × 5 × 2¼ in. platinum plate 7 × 3½ in., porous cell 5¾ × 4¼ × 1 in., bent zinc 7 × 4 in.; complete	... ..	0 12 6

Old
Cat.No.

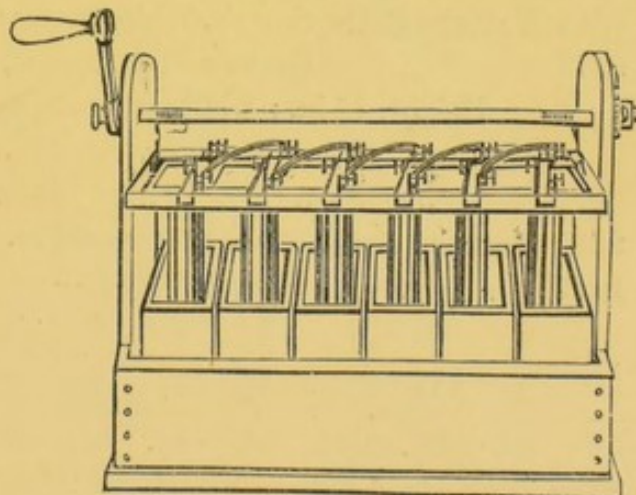
1302	2239	Leclanche's Patent Constant , for Electric Bells, &c., retain the full working power for about eighteen months, and require no further attention after being charged than the occasional addition of a little water ; complete with charging	... ..	No. 3, 1 Pint	£0 2 6
				No. 2, 1½ ,,	0 3 0
				No. 1, 1 Quart	0 4 0

1302A 2240 **Leclanche's Patent**, agglomerate without porous cell,
used for Electric Bells, Railway Signals, Firing pur-
poses, &c. ; will perform three or four times as much
work as the old Porous Pot form—

No.	3	2	1
Capacity	1 Pint	1½ Pint	1 Quart
	3/6	4/6	5/6 each complete
Carbon Plates	... 9d.	1/	1/3 each
India Rubber Rings	... 5d.	6d.	8d. per pair
Zinc Rods	... 4d.	5d.	6d. each
Chargings	... 4d.	6d.	8d. ,,
Glass Jars	... 9d.	1/	1/6 ,,

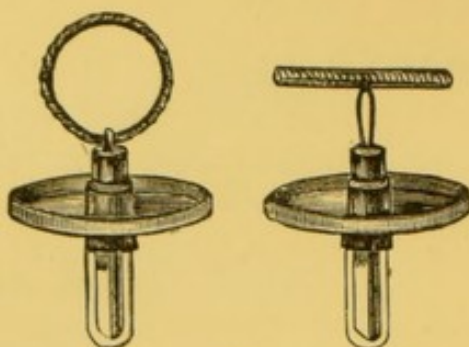


2241

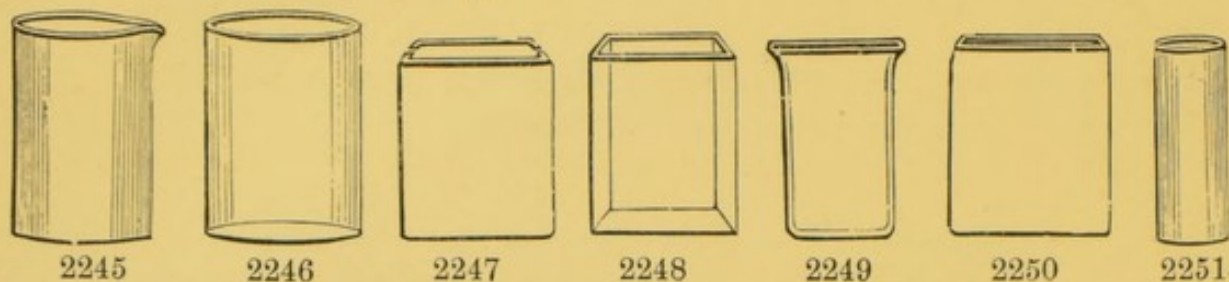


2243

1303	2241	Smee's , in Glass or White Stoneware cell— Size of cell, 5¼ × 4 × 1⅞ in.	... ..	£0 6 0
1304	2242	Smee's Batteries , set of 6, in mahogany Tray, as Fig. 2236		1 15 0
1305	2243	,, ,, set of 6, in mahogany frame, with rack- work arrangement	... ..	2 10 0



Old Cat.No. 2244
 1305A 2244 Batteries, Floating... each £0 5 6



1306 2245 Battery Cells, Bunsen's, Brown Stoneware, with Lip, $5\frac{1}{2} \times 3\frac{3}{4}$ in. £0 0 8

1307 2246 " " " Glass, Stout—
 Height 5 6 8 8 $9\frac{1}{2}$ 10 in.
 Diam. 4 4 4 5 $6\frac{1}{4}$ $8\frac{1}{4}$ in.
 8d. 10d. 1/ 1/6 2/ 4/ each

1308 2247 Battery Cells, Grove's White Stoneware (2247), or glass (2248) £0 1 0

1309 2248 Battery Cells, Smee's, White Stoneware, as fig. 2247 or 2248 0 1 0

1310 2249 " Grove's Flat, Porous, with Lip—
 Height, $4\frac{3}{8}$ in.; width at top, $3\frac{3}{8}$ in.; width at bottom, $2\frac{1}{2}$ in. 0 0 5
 " 5 " " $4\frac{3}{8}$ " " $3\frac{5}{8}$ " 0 0 7
 " $5\frac{3}{4}$ " " $4\frac{1}{4}$ " " 4 " 0 1 0

1311 2250 Battery Cells, Flat, Porous— $6\frac{3}{8}$ in. \times $4\frac{1}{2}$ in. \times 1 in. ... 0 1 0

1312 2251 " Round, Porous—
 2 3 4 5 6 6 7 8 9 10 12 in. diam.
 1 $1\frac{1}{2}$ $1\frac{1}{2}$ $1\frac{3}{4}$ $1\frac{3}{4}$ 2 $2\frac{1}{4}$ $2\frac{1}{2}$ $2\frac{1}{2}$ $2\frac{3}{8}$ $2\frac{3}{8}$ in. long
 2d. 2d. 3d. 3d. 4d. 4d. 5d. 6d. 7d. 8d. 1/4 each

2252 Platinized Silver Sheet, for Smee's Batteries ... per oz. £0 10 0

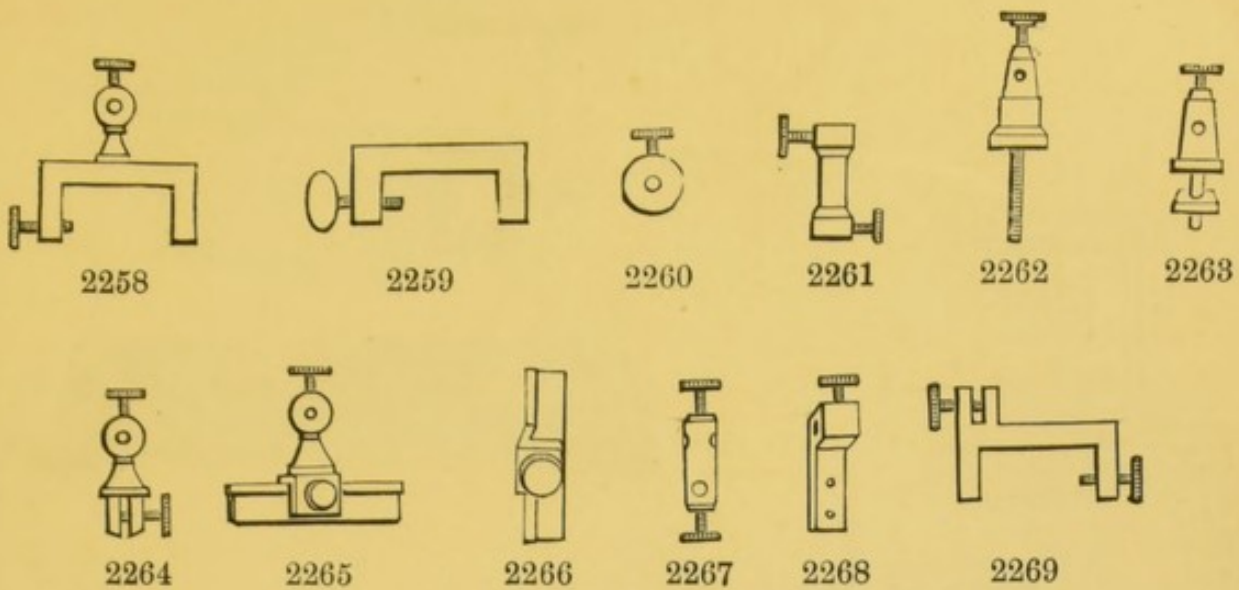
2253 Platinum Sheet, for Grove's ... per dram 5/, or ,, 1 15 0

1313 2254 Carbon Blocks, for Bunsen's Batteries—
 $7 \times 1 \times 1$, 8d. $8 \times 1 \times 1\frac{1}{4}$, 1/. $9 \times 1\frac{1}{2} \times 1\frac{1}{2}$, 1/6 each

1314 2255 Carbon Plates, for Bichromate Batteries, &c.—
 $4 \times 1\frac{3}{4} \times \frac{3}{8}$, 6d. $6 \times 1\frac{1}{4} \times \frac{3}{8}$, 8d. $6 \times 2 \times \frac{3}{8}$, 10d. $6 \times 3 \times \frac{3}{8}$, 1/.
 Carbon Blocks or Plates, any size, made to order.

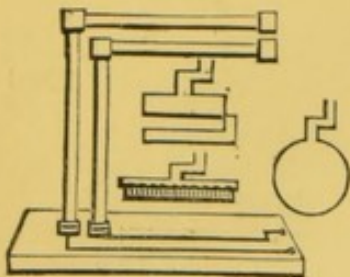
1315 2256 Carbon Pencils, 12 in. \times $\frac{1}{4} \times \frac{1}{4}$... each 0 1 0

1316 2257 " Points, for Electric Light, 3 in. \times $\frac{5}{16}$ per pair 0 0 6

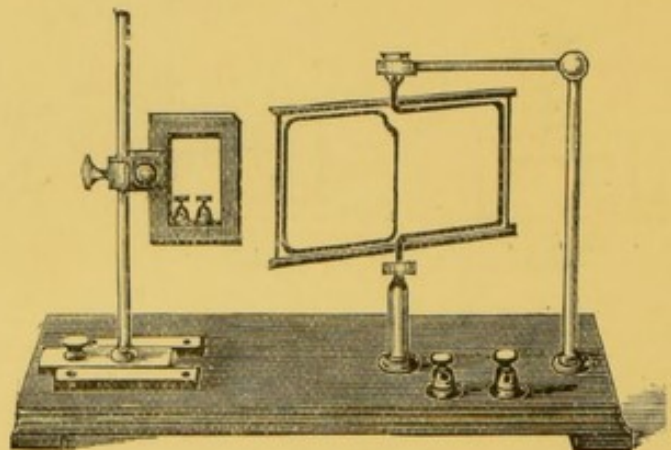


SCREWS FOR BATTERIES.

Old Cat.No.								
1317	2258	Bunsen's	...	...	...	...	each 7d., per doz.	£0 6 6
1318	2259	Clamps	...	...	...	each, 6d. and 8d., per doz.	5/ and	0 7 0
1319	2260	Connector, Single	...	...	...	each 6d., per doz.		0 5 0
1320	2261	,,	Double, each 6d., 8d. & 10d., per doz.	5/, 7/ &				0 9 0
1321	2262	Daniell's, Single, small	...	...	...	each 2d., per doz.		0 1 6
		,, medium	...	...	...	4d.	,,	0 3 0
		,, larger	...	...	...	6d.	,,	0 5 0
1322	2263	,,	with nut, small	...	...	3d.	,,	0 2 0
		,,	larger	...	...	4d.	,,	0 3 0
1323	2264	,,	Double	...	...	5d.	,,	0 4 6
1324	2265	Grove's, Terminal	...	...	...	7d.	,,	0 6 0
1325	2266	,,	Single	...	...	5d.	,,	0 4 6
1326	2267	Connector, Double, small	...	...	...	3d.	,,	0 2 0
		,,	medium	...	...	4d.	,,	0 3 0
		,,	larger	...	...	5d.	,,	0 4 0
1327	2268	Smee's, Single	...	...	...	6d.	,,	0 5 0
1328	2269	,,	Double	...	...	8d.	,,	0 7 0



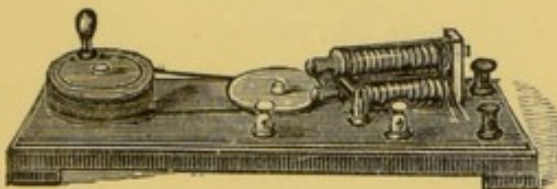
2270



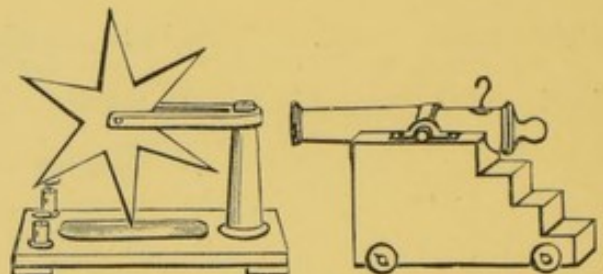
2272

Old
Cat.No.

1829	2270	Ampere's Stand,	with Wires to show attraction of parallel currents	... ..	£1 5 0
1830	2271	„	„ with Reverser	... ..	1 10 0
1830A	2272	„	„ with set of 3 bent Wires on moveable circuit, and mutual action of currents flowing in different directions	2 10 0



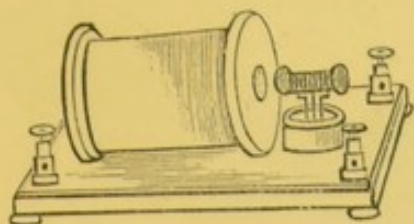
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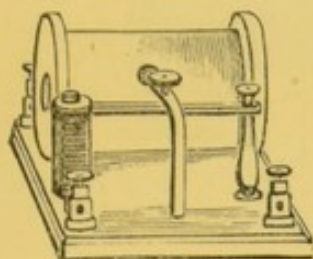
2274

2278

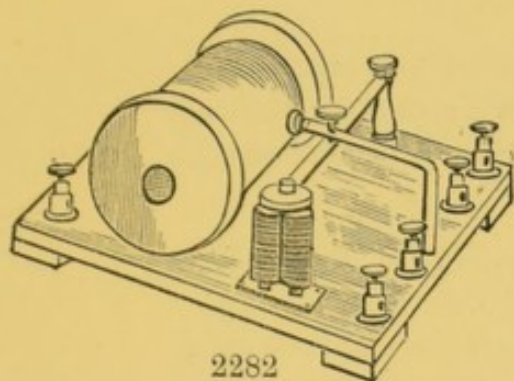
1831	2273	Apparatus to show current produced in a Copper Disc rotating between Poles of Magnet	£2 0 0
1832	2274	Barlow's Stellar Wheel	... ..	0 10 6
1833	2275	Bar, Soft Iron on Disc	... ..	0 2 6
1834	2276	Bars of Antimony, Bismuth and Nickel	... ..	0 4 6
1835	2277	Bobbin of Wire to show induction	... ..	0 5 0
1835A	2278	Cannon, mounted on Mahogany Stand	... ..	0 10 6
1836	2279	Chain, alternate Links Platinum and Silver	5/6 and	0 9 0



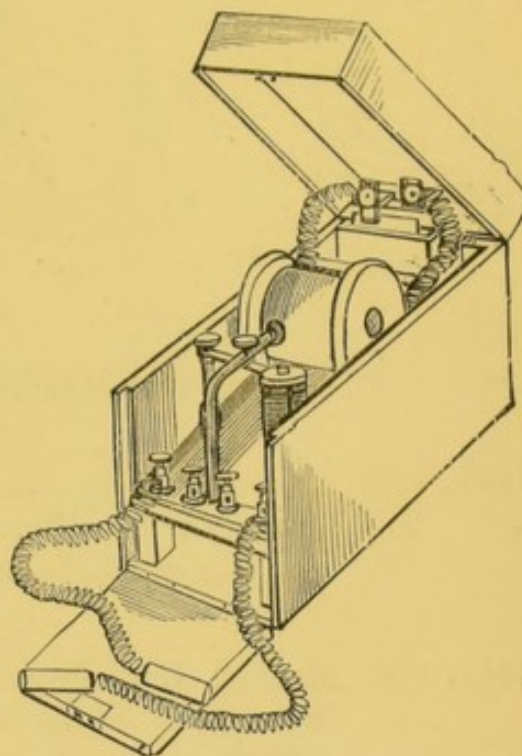
2280



2281



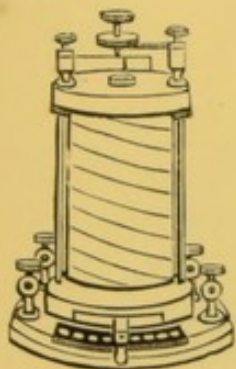
2282



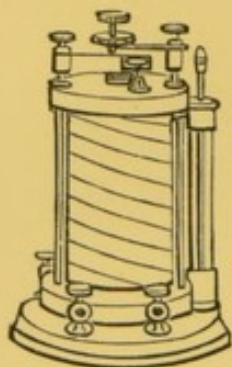
2283

Old
Cat.No.

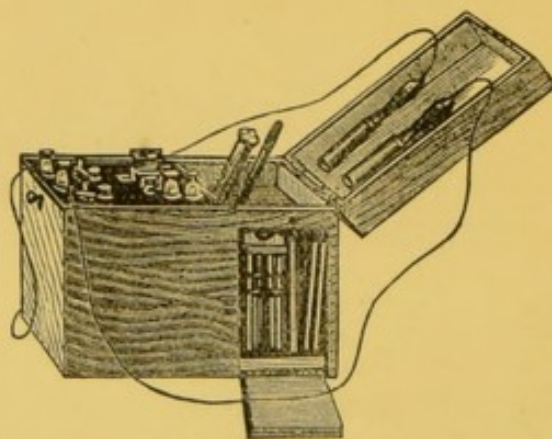
1337	2280	Coil Machine, on polished mahogany stand, with handles for shocks, Mercury Contact Breaker	... £0 12 6
1338	2281	.. and handles for Medical use, with Spring Contact Breaker, and moveable coil of soft iron wire for regulating the intensity	... 0 18 0
1339	2282	.. larger size, with extra screws for arranging the current to either quantity or intensity, and suitable for professional purposes	... 1 4 0
1340	2283	.. for Medical use, with pair of handles, pair of Sponge Directors, Brass Discs on wood handle, Flexible Cord, and Smee's Battery, complete in polished mahogany or teak case	2 10 0
1341	2284	.. very powerful, with additional primary and secondary wire, on substantial polished mahogany stand	... .. 3 15 0



2285



2286



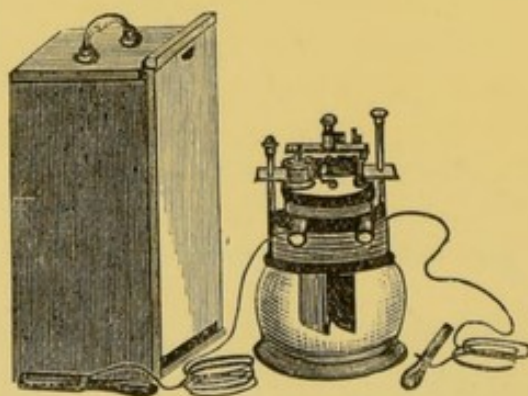
2287

Old
Cat.No.

1342 2285 **Vertical Coil Machine**, best make, with lever regulator £1 15 0

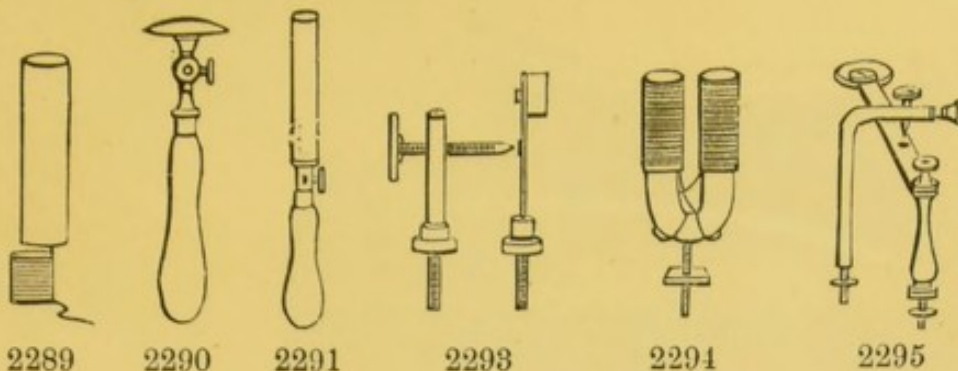
1343 2286 " " " with water regulator arranged for quantity or intensity, and can be either used for Medical purposes or showing the electric light in vacuum tubes ... 2 10 0

1343A 2287 **Medical Coil Machine**, as supplied to the Indian Government for the use of Medical Officers, with simple and effective lever arrangements for regulating the shock, Bichromate Battery, and extra zinc plates, sponge directors, flexible cord and handles complete, in polished mahogany case, convenient for medical practice... ... 4 0 0

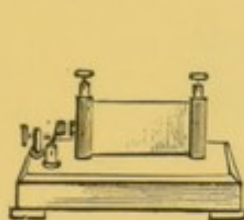


2288

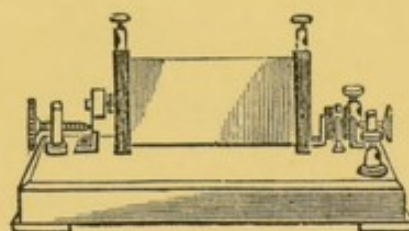
1343B 2288 **Medical Coil**, nickel plated fittings, with Bichromate Battery attached, Handles and Directors, for Medical use, in polished mahogany case, complete £2 0 0



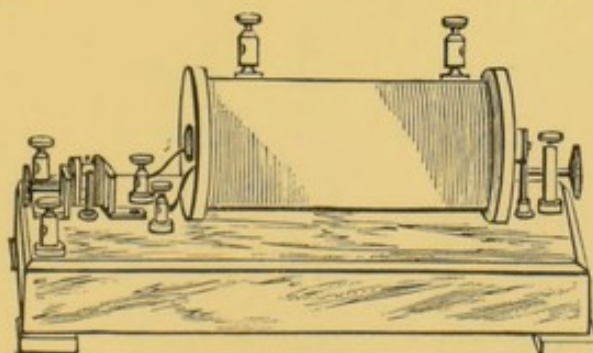
Old Cat. No.	1344	2289	Brass Handles, with wire attached, for shocks...per pair	£0 2 0
1345	2290	Brass Disc, on insulated handle, to direct the current on a particular nerve	,,	0 4 6
1346	2291	Sponge Directors	,,	0 4 6
1347	2292	Flexible Brass Cord, for conductors...per yard, 4d. and <i>(Parts of Coil Machines.)</i>	0 0 6	
1348	2293	Steel Spring Contact Breaker, with brass screws and platinum points for Induction Coil— the set, each 2/9, 3/6, 4/6, and	0 5 3	
1349	2294	Small Electro Magnet, for Contact Breaker	0 1 9	
1350	2295	Spring Contact Breaker, with screw and platinum points the set	0 5 0	



2296

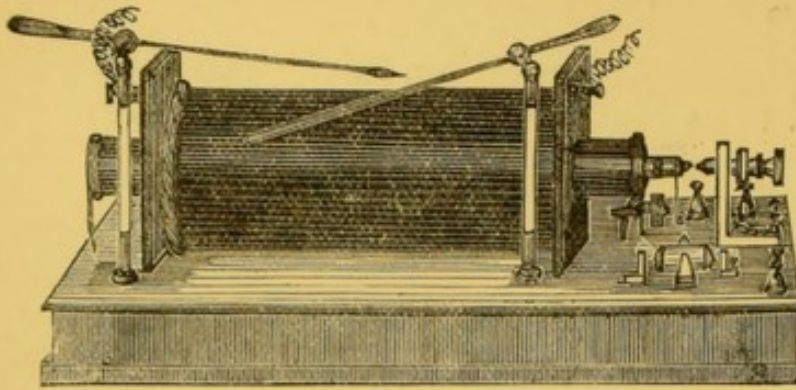


2298

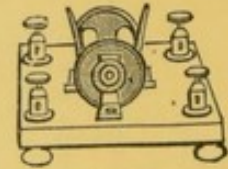


2299

1351	2296	Induction Coil, Ruhmkorff's, will give $\frac{1}{4}$ inch Spark	£0 12 0
1352	2297	,, ,, ,, with Commutator $\frac{5}{16}$,, ,,	0 16 0
1353	2298	,, ,, ,, ,, $\frac{7}{16}$,, ,,	1 10 0
1354	2299	,, ,, ,, ,, $\frac{9}{16}$,, ,,	2 2 0
1355	2300	,, ,, ,, ,, $\frac{13}{16}$,, ,,	3 0 0
1356	2301	,, ,, ,, ,, $1\frac{3}{16}$,, ,,	3 10 0
	2302	,, ,, ,, ,, 2 ,, ,,	6 6 0
	2303	,, ,, ,, ,, 3 ,, ,,	9 0 0
	2304	,, ,, ,, ,, 4 ,, ,,	10 10 0



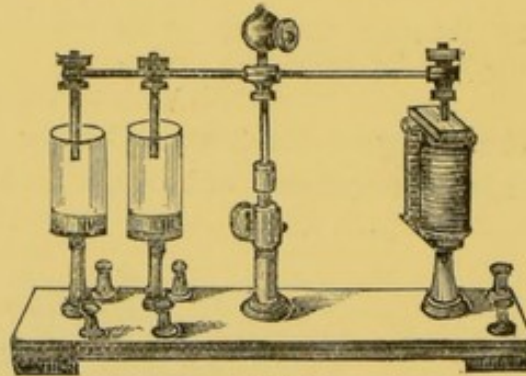
2305



2307

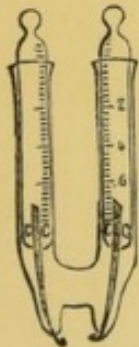
Old
Cat.No.

1356A	2305	Induction Coil, Ruhmkorff's, with Commutator, will give 4 inch Spark... ..	£12 12 0
1356B	2306	" " 6 " "	22 10 0
1357	2307	Commutator on mahogany stand, for changing the current	0 10 6

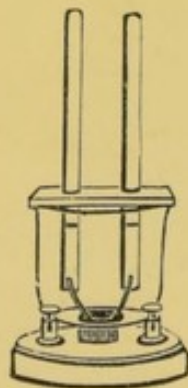


2308

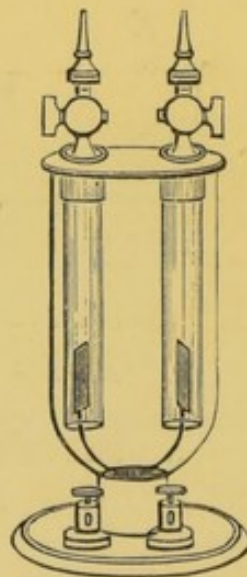
1357A	2308	Foucault's Mercury Break, for use with Induction Coils	2 10 0
	"	" " with Contact Breaker ...	3 5 0



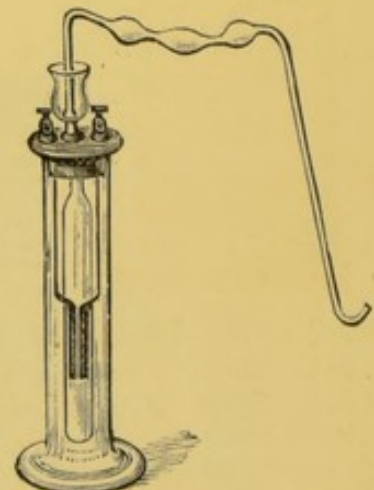
2309



2310



2311

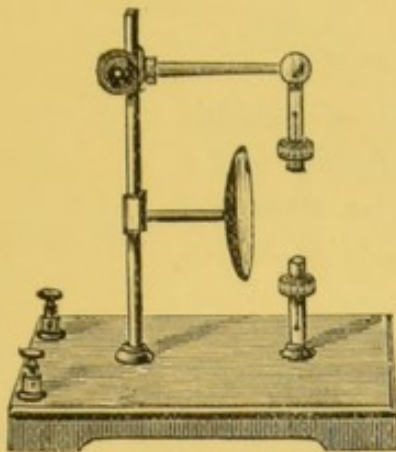


2312

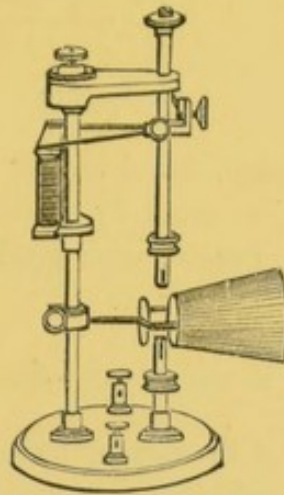
1358	2309	Decomposing Water Tubes, graduated, with Platinum Electrodes	2/6 and	£0 3 6
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Old
Cat.No.

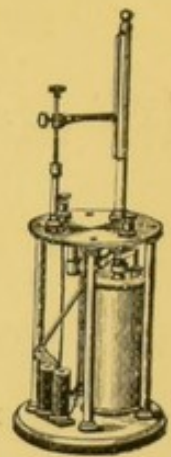
1359	2310	Decomposing Water Apparatus, on stand, with 2 tubes, 8/6 & £0 10 6	
1360	2311	,, ,, large for Lecture Table	1 5 0
1361	2312	,, ,, Bunsen's, with Gas Delivery Table ...	0 8 6
1362	2313	,, ,, 2 Graduated Tubes, Platinum Electrodes, and Stand	0 7 6



2315



2317

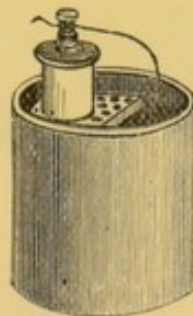


2318

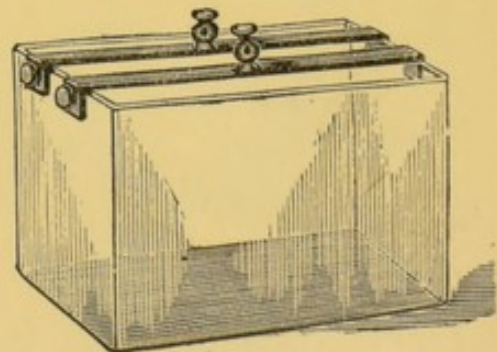
1364	2314	Electric Light Carbon Holders, for the Hand...per pair	£0 3 0
1365	2315	,, ,, ,, ,, on Stand, with Rackwork	0 12 0
1366	2316	,, ,, ,, ,, ,, and Reflector	0 15 0
1367	2317	,, Lamp, with Cone Reflector	2 0 0
1368	2318	,, ,, best, in Brass Body, large size, suitable for Lecture purposes, Theatre, or out-door Illuminations, with Hough's Glycerine Regulator	7 0 0



2319

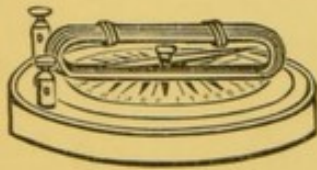


2321

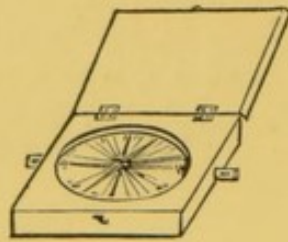


2322

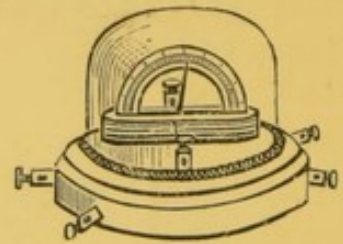
1371	2319	Needle, for Table use or Lecture Demonstration, per pair	£1 5 0
1372	2320	Needle, with fine Wire Coils and Bell, a practical instrument per pair	2 15 0
1374	2321	Electrotype Apparatus, single cell, complete	0 3 0
1375	2322	Decomposing Trough, earthenware, for electro-plating, &c., with 2 bars, and screws, $6\frac{1}{4} \times 4 \times 5\frac{1}{2}$	0 7 6
1376	2323	,, ,, ,, ,, $12\frac{1}{2} \times 8\frac{1}{2} \times 8\frac{1}{2}$	0 10 6



2324



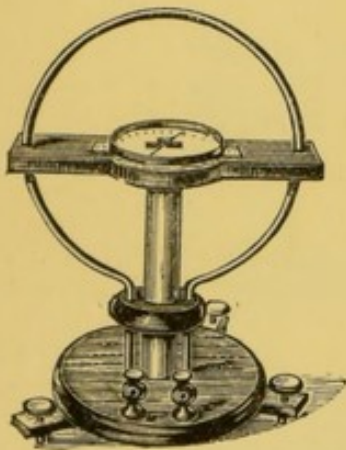
2325



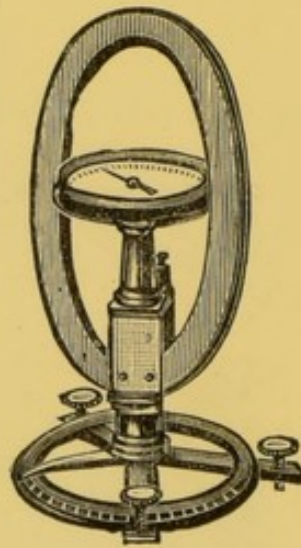
2326

Old
Cat.No.

1877	2324	Galvanometer, for detecting the presence of galvanic currents by the amount of deflection of the needle, with graduated scale, on mahogany stand	£0 7 6
1878	2325	„ in mahogany case	0 5 6
1879	2326	„ with upright metal disc, graduated, in glass shade	0 12 6



2327

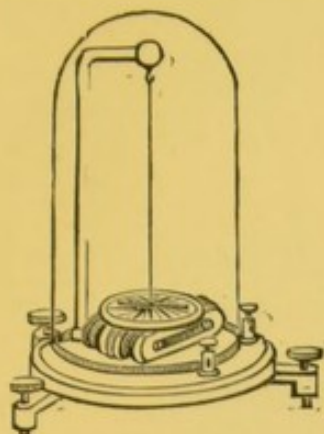


2328

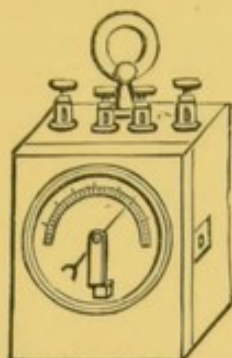


2330

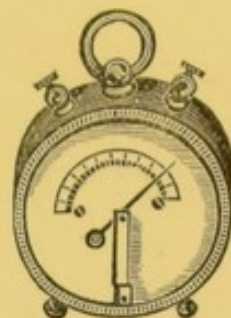
1880	2327	Galvanometer Tangent, very delicate, for Thermoelectric currents	£3 15 0
1880A	2328	„ Sine, with circle divided to 5 Secs.	3 15 0
1880B	2329	„ „ „ „ 2 „	8 10 0
1880C	2330	„ Thompson's Reflecting	6 10 0
	2331	„ „ „ superior make	10 10 0



2332



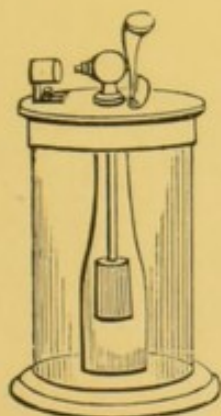
2335



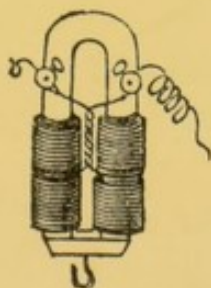
2336

Old
Cat.No.

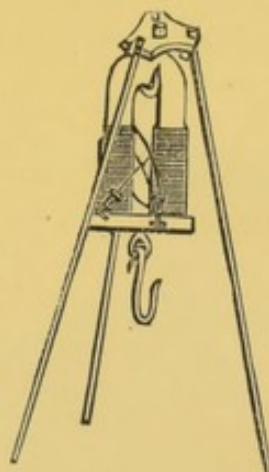
1381	2332	Galvanometer Astatic Needle, in glass shade, silk suspension	£1 5 0
1382	2333	„ „ „ ebonite coil frame, and adjustment for suspension	... .. 2 0 0
1383	2334	„ with silvered dial extra	0 6 0
1384	2335	„ for testing fine and coarse currents, £1 15/ &	2 10 0
1384A	2336	„ for testing fine and coarse currents, in brass case	1 15 0



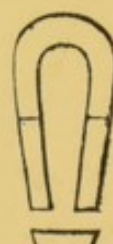
2337



2338



2342

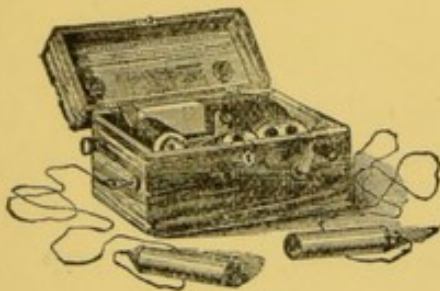


2343

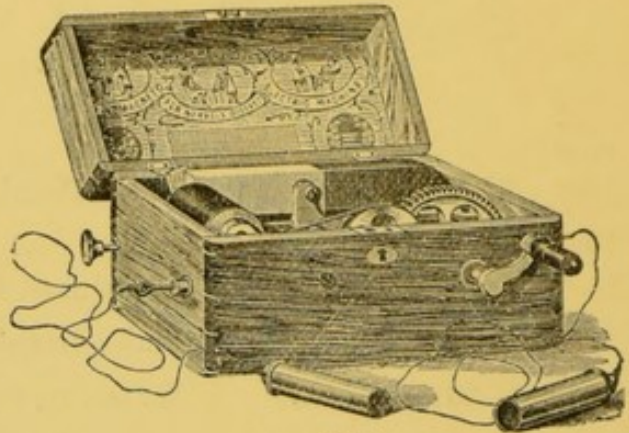
1385	2337	Dobereiner's Lamp, complete	... ..	£0 10 6
1386	2338	Magnet Electro, soft iron, covered with insulated copper wire, with hook or keeper for suspending weights when attached to battery, diameter of iron core, $\frac{1}{2}$ in.	0 2 6	
	2339	„ „ with pair connecting screws	„ $\frac{5}{8}$ in.	0 4 0
	2340	„ „ „ „	„ $\frac{3}{4}$ in.	0 7 6
	2341	„ „ „ „	„ 1 in.	0 12 0
1387	2342	„ „ on tripod stand	„ 1 in.	1 0 0

Old
Cat.No.

1889	2343	Magnets, Horse Shoe—	2½	3	3½	4	5	6	7	8	9	10	11	12 in.
			4d.	5d.	8d.	10d.	1/6	1/9	3/	4/	6/	8/	10/	12/ each
1890	2344	Magnets, Bar Steel, polished—							6	8	10	12 in.		
									2/	3/	4/6	5/6	per pair	
1891	2345	„ „ „							12 × 1½ × ½, pair,	10/6;	each	£0	5	6

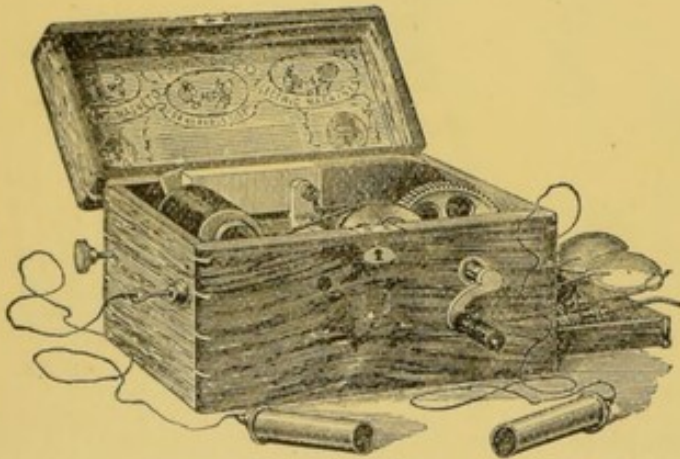


2346

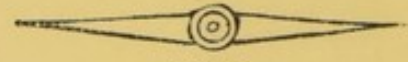


2347

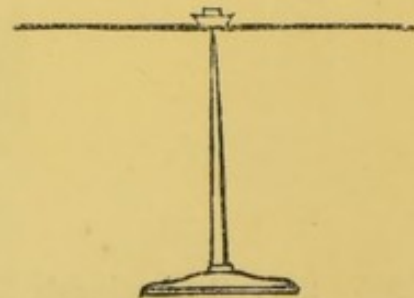
1894	2346	Magneto-Electric Machine, Pocket, with handles for giving shocks, in walnut case	£1	1	0
1895	2347	Magneto-Electric Machine, for medical purposes, with handles, directors, &c. ...	1	10	0



2348

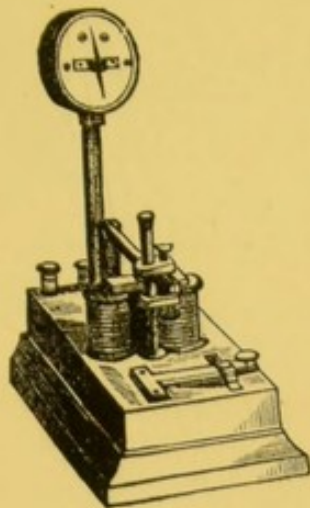


2349

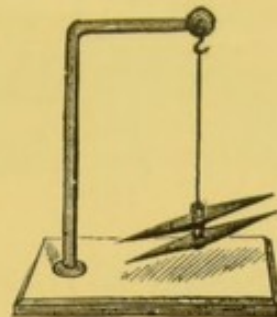


2350

1896	2348	Magneto-Electric Machine, superior make, with drawer and extra directors, &c. ...	£2	2	0
1897	2349	Magnetised Needle, with brass pivot—			
		2 3 4 6 inches length			
		1/6 2/ 2/6 3/6 each			
1898	2350	Magnetised Needle, vertical, on brass stand, with steel point	3/	4/	and
			0	5	0



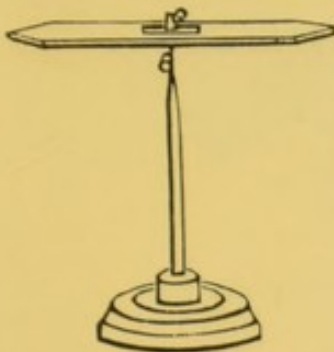
2351



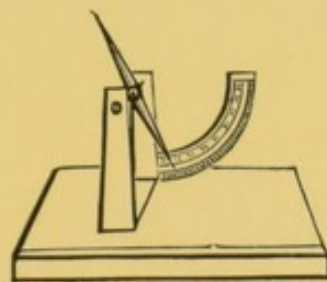
2352

Old
Cat.No.

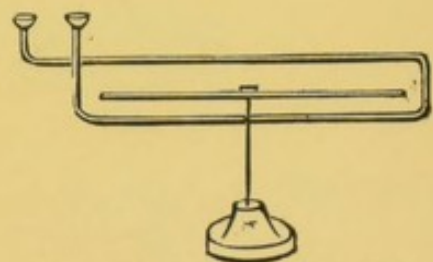
1398A	2351	Morse's Telegraph Sounder	...	...	...	...	£3 15 0
1399	2352	Needle, Astatic, simple, on stand	...	...	...	...	0 7 6



2353

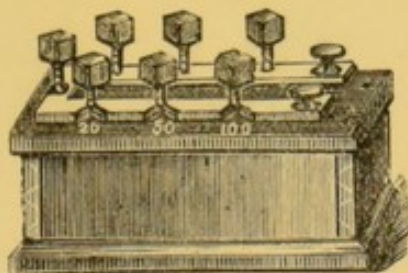


2354

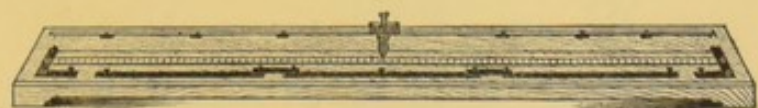


2356

1400	2353	Needle, Dip, polished steel, on pivot, with stand	...	...	...	...	£0 10 6
1401	2354	,, ,, with graduated arc, on mahogany stand	...	...	...	...	0 16 0
1401A	2355	,, ,, without arc	...	...	...	...	0 7 6
1402	2356	Ersted's Apparatus for showing the deflection of the magnetic needle by a copper wire	...	...	.. 3/6 and	...	0 10 0

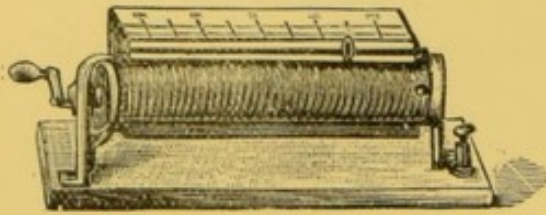


2357

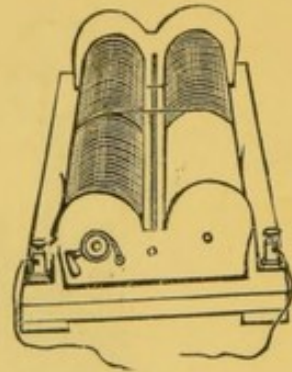


2358

1403	2357	Resistance Box, set of, for use with Rheostat, up to 100 Ohms., best make	£5 5 0
1403A	2358	Wheatstone's Bridge, for use with Rheostat	2 5 0



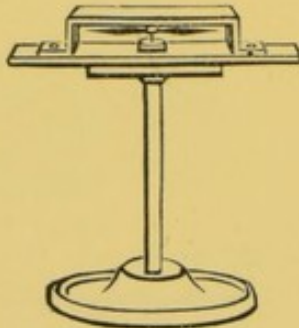
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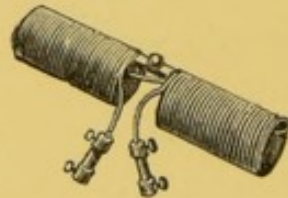
2360

Old
Cat.No.

1403B	2359	Rheostat, for resistances, Wheatstone's	£1 10 0
1403C	2360	Rheocord	„	„	two ways	3 10 0



2361



2362

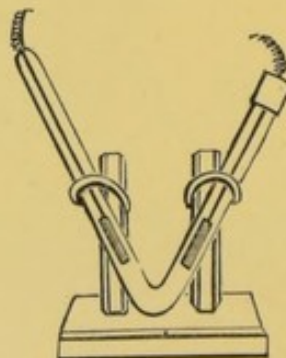
1404	2361	Seebeck's Rectangle, or frame of bismuth and antimony, with magnetic needle suspended	...	...	...	£0 12 0
1404A	2362	Solenoid, for converting a bar of soft iron into a magnet				0 5 0
	2363	Spirals, on board	...	...	...	per pair 0 5 0



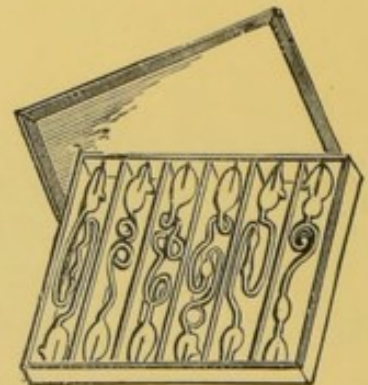
2364



2365



2366



2367

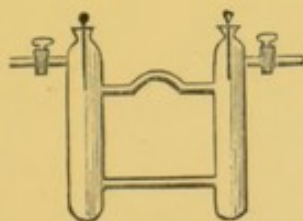
1405	2364	Thermo-Electric Pair of bismuth and antimony, V shape, with wire for connecting with battery, on brass stand				£0 8 6
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Old
Cat.No.

1405A	2365	Thermometer Electric Alarum , for drying closets, &c., can be adjusted to ring a bell at any required temperature	£0 7 6
1406	2366	V Tube , with electrodes for decomposition of neutral salts, and mahogany stand	0 5 6
1407	2367	Vacuum Tubes , for showing the brilliant effects produced by the electric current in vacuo— Set of 4 Tubes, various designs, 4 to 5 in., each 2/, set in box	0 6 6
	„ 6	„ „ 6 in. „ 2/3 „	0 10 0
	„ 6	„ „ 8 in. „ 2/6 „	0 14 0
	„ 6	„ „ 9½ in. „	1 10 0
	„ 7	„ „ 14 in. for Demonstration	3 0 0
	2368	Spectrum Tubes containing the following Gases— O, H, N, CO ₂ , H ₂ O, Cl, H Cl, Br, I, Cy, H Cy, N O, N O ₂ each	0 3 0
	2369	Phosphorescent Powders , in flat Tubes, the Phosphorence being produced on exposure to light— 3 different Colours in case	0 5 0
		5 „ „ „ „	0 8 0
		7 „ „ „ „	0 15 0



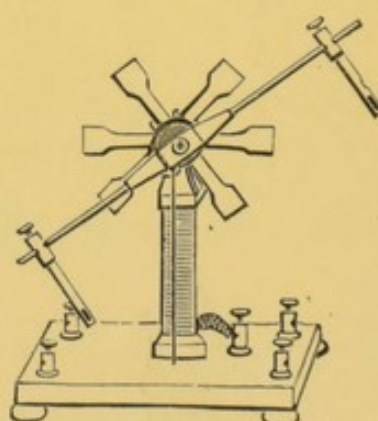
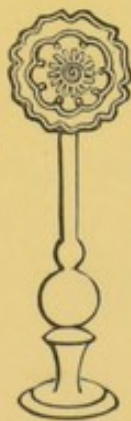
2370



2371



2372



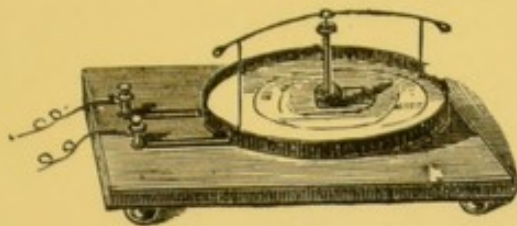
2373

1407A	2370	Vacuum Tube , with 2 Stopcocks and Platinum Wires, for filling with Gases for Spectrum Analysis ...	£0 9 0
1727	2371	Vacuum Tube , with Stopcocks and Platinum Wires, to show the length of spark	0 10 0
1408	2372	Vacuum Tubes , various designs ... from 6/ each to	2 0 0
1409	2373	Vacuum Tube Revolver , or small Magnetic Engine, for 6 inch tubes	1 10 0

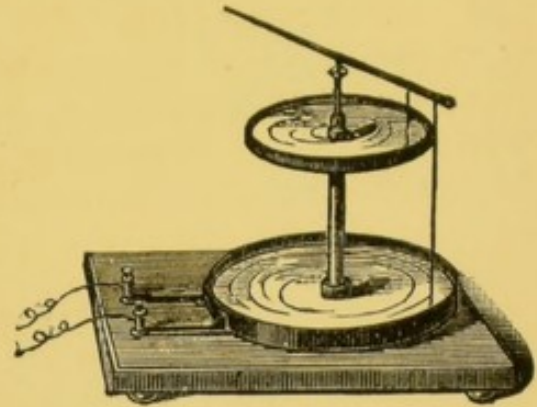
(Other Patterns supplied.)

Old
Cat.No.

1419	2382	Wire, Bent, rotating on an axis in its own Plane	...	£0	10	6
1420	2383	„ rotating	... ..	0	10	6
1421	2384	„ vibrating	... ..	0	5	6

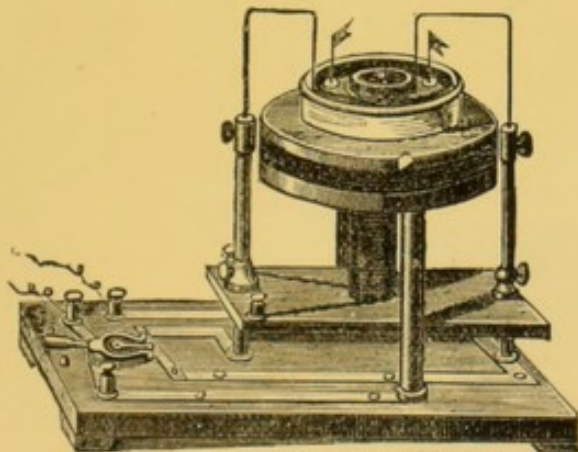


2385

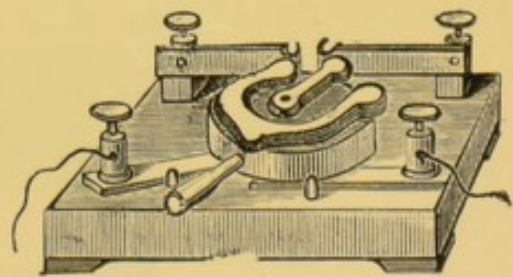


2386

1421A	2385	Apparatus to illustrate the action of the Earth on a horizontal current	...	£1	5	0
1421B	2386	Ditto	Ditto	on a vertical current	...	1 15 0

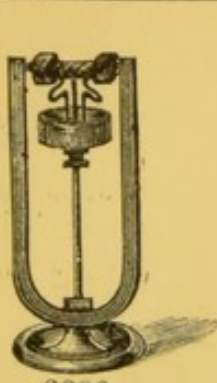


2387

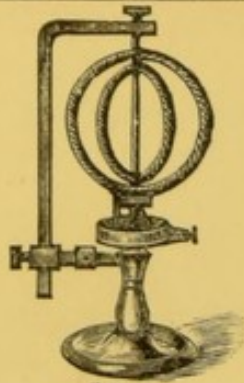


2388

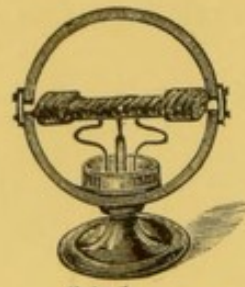
1421c	2387	Apparatus to illustrate Electro-Magnetic Rotation of Liquids, with Bertin's Commutator and moveable stage	£3	5	0
1421D	2388	Bertin's Commutator	1	5	0



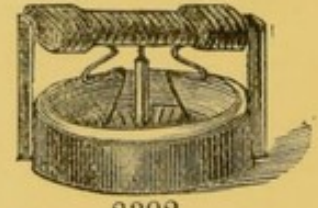
2389



2390



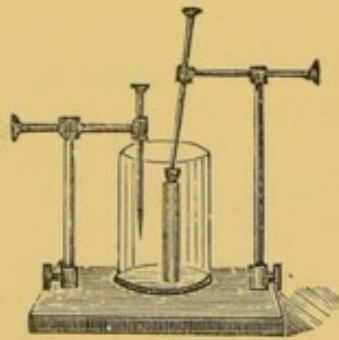
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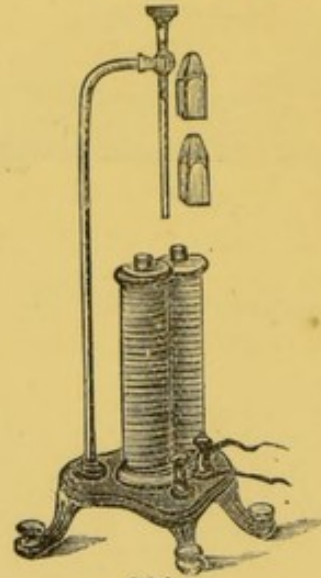
2392

Old
Cat.No.

1421F	2389	Ritchie's Rotating Magnet	£0 14 0
1421G	2390	Ritchie's Wires to show Reversed Currents	1 0 0
1421H	2391	„ Permanent and Electro Magnet	... ..	0 14 0
1421I	2392	Sturgeon's Mercury Break	... .. 5/6, 8/6 and	0 14 0

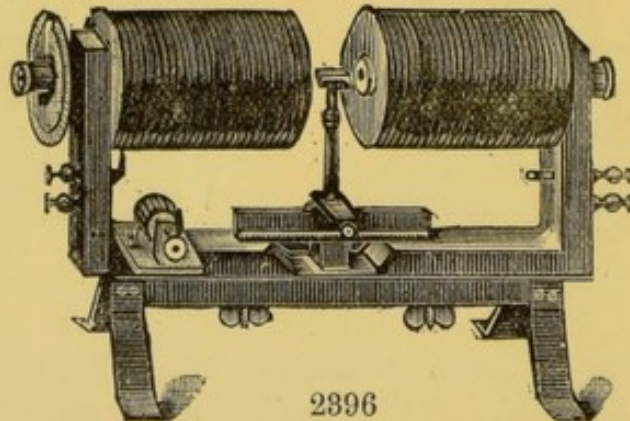


2393



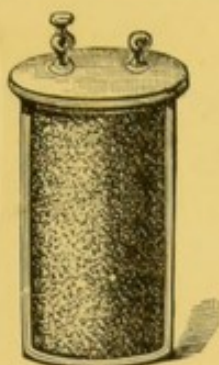
2394

1421K	2393	Faraday's Rotation of Magnets by Currents	... ..	£1 15 0
1421L	2394	Dia-Magnetic Apparatus, with upright Magnets, on Stand with 2 Sets of Poles	... ..	10 0 0
1421M	2395	Coil to show Theory of Induction	... ..	0 15 0

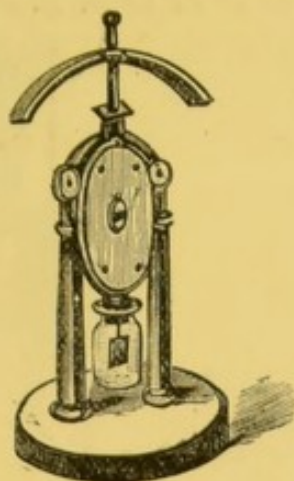


2396

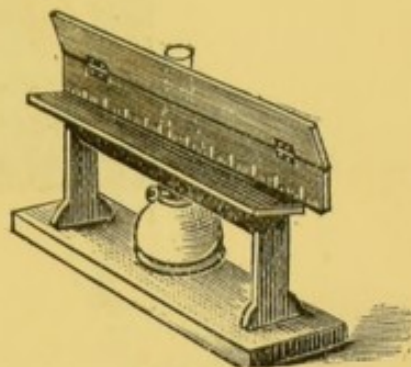
1421N	2396	Dia-Magnetic Apparatus, best quality, with Coils, on Sliding Frame, Vernier, Commutator, Hollow Cylinders, Hollow and Solid Poles, Suspension Apparatus, &c.	£25 0 0
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2397



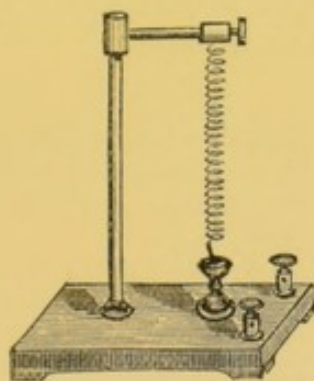
2398



2399

Old
Cat.No.

1421o	2397	Plantes' Secondary Cell, charged by two Bunsen's Batteries or Medium Grammes Machine, experiments may be performed in Dia-Magnetism and Electric Light, the Battery will require re-charging after a few minutes, but will remain in action a sufficient length of time for the experiments; surface of Lead Plates about 125 square inches ...	£0 15 0
1421p	2398	Mirror Galvanometer, for testing purposes	7 10 0
1421q	2399	Lamp and Stand, for use with above	2 10 0



2400



2402



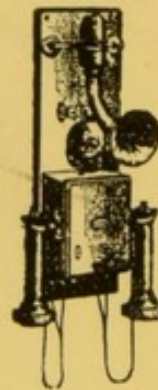
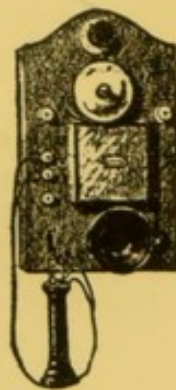
2403



2404

1421E	2400	Copper Helix, to show contraction	£1 8 0
1422	2401	Zinc Plates, for Smee's Batteries, 5 in. × 2½ in. per pair	0 0 8
1423	2402	„ Rod, for Daniell's „ 4½ in. × 1 in. each	0 0 6
		9 in. × 1 in. „	0 1 0
1424	2403	„ Cylinder, for Bunsen's „ 6 in. × 3 in. „	0 1 6
		8 in. × 5 in. „	0 3 6
1425	2404	„ Plate, bent for Grove's 5½ in. × 2½ in. „	0 1 3
		7 in. × 4 in. „	0 2 3

Other Sizes made to order.

TELEPHONES.

2405

Old
Cat.No.
1728 2405

TELEPHONE APPARATUS.

In consequence of the action taken by the United Telephone Company we have been compelled to withdraw from our Catalogue all the parts of Telephone Apparatus which we have been in the habit of supplying to Students, Lecturers, and others desirous of obtaining a knowledge of the working and use of the instrument for experimental purposes, who inflicted on us a penalty of about £500, including costs, which we have paid rather than contest their right, at a cost of probably £2,000 or £3,000 in law costs. As the United Telephone Company will not now sell any of their Instruments, and prosecute any persons using Instruments which are not licensed, we have entered into an arrangement with the New Telephone Company by which we can supply perfect Instruments, with the guarantee from them to indemnify the purchaser against any claim, and will defend any Action brought.

NEW TELEPHONE COMPANY, LIMITED.

(Under License from the Postmaster-General.)

NOTICE.

This Company has just completed new arrangements for manufacturing, and is now supplying the public with two different types of instruments of entirely new design. In each of these designs many important improvements (the result of three years' experience in manufacturing) have been introduced.

Class A—Suitable for short lines, and admirably adapted for Hotels, Hospitals, Clubs, and other large buildings, where they will be found cheaper than speaking tubes; Price £2 per instrument.

Class B—Efficient for Exchanges and on long lines. Price £6 per instrument.

Rental—The Company is prepared either to sell outright or to erect and maintain their Instruments, Lines, &c., in London and suburbs at a fixed charge per annum.

Receivers in Ebonite Cases, same as supplied with Class B Instruments, at 20/ each.

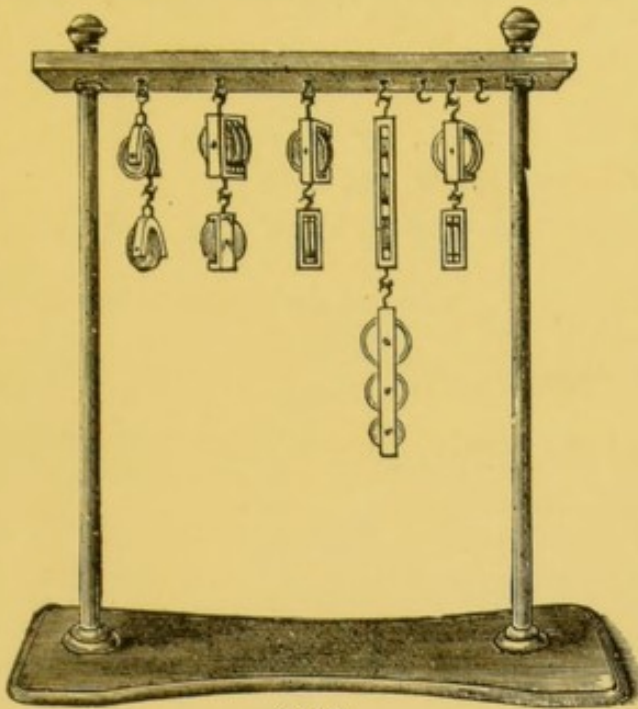
The Instruments above referred to are manufactured under the Patents of Prof. Silvanus P. Thompson and others.

The New Telephone Company's Telephones have been in successful operation in leading towns in the Kingdom during the past three years. They are distinct and clear in articulation, and their fixing is as simple as that of Electric Bells.

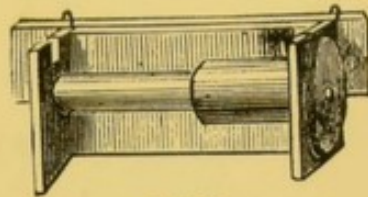
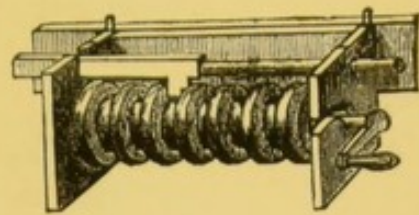
Numerous satisfactory testimonials have been received from the Company's customers and may be seen at the Company's Office. A formal guarantee will be given against any claims which may be made by Trade Rivals for alleged infringement.

Price Lists, Estimates, and Copies of Testimonials free on application.

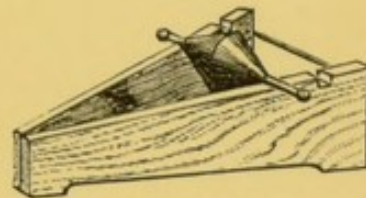
MECHANICS.



2406



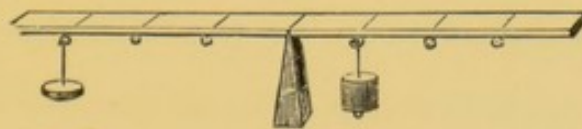
2407



2409

Old
Cat.No.

1469	2406	System of Pulleys, consisting of jappaned iron frame 3 feet high, 2 feet 6 wide, with brass pillars, and set of 10 brass pulleys and cord	... ..	£3 15 0
1470	2407	Wooden Screw, screw flat thread, 6 in. × 3 in., handle and bracket, with wheel and axle adapted to the bracket, black wood	... ..	0 17 6
1471	2408	,, ,, polished mahogany	... ..	1 5 0
1472	2409	Double Cone, and inclined plane, black, cone white wood	... ..	0 8 6
1473	2410	,, ,, mahogany, cone white wood	... ..	0 12 6



2411

1474	2411	Lever and Wedge-shaped Fulcrum, frame 4 feet × 2 feet × $\frac{5}{8}$ in. thick, divided into 8 equal parts, with brass rings below for suspension, without weights, black wood	... ..	£0 5 0
1475	2412	,, ,, ,, ,, polished mahogany	... ..	0 7 6



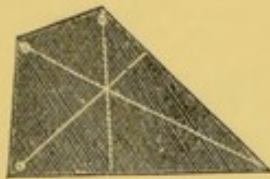
2413



2416

Old
Cat.No.

1476	2413	Lever for Suspension, 3 feet \times 2 in., for supporting weights, divided into 20 equal parts, provided with holes and divisions for supporting weights, black wood	£0 4 0
1477	2414	„ „ „ „ polished mahogany	0 5 6
1478	2415	4 pairs Zinc Weights for ditto	0 6 0
1479	2416	Frame to attach to School Black Board, black wood...	0 4 6
1480	2417	„ „ „ „ mahogany ...	0 7 0



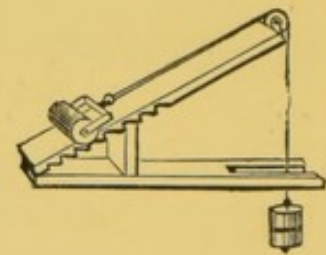
2418



2419

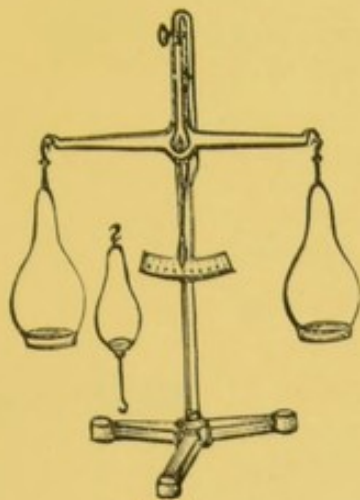


2422

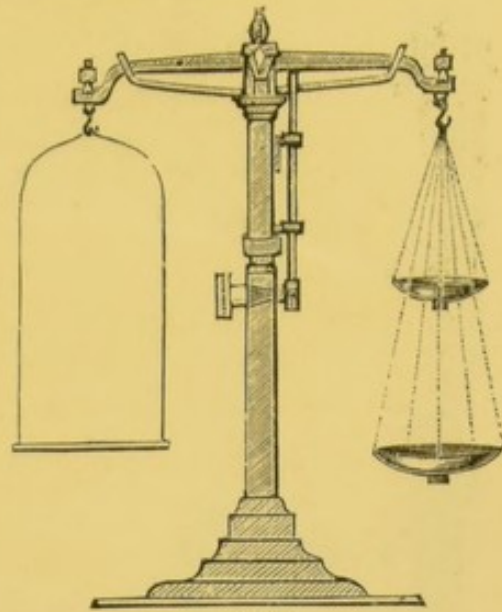


2424

1481	2418	Iron Irregular Plate (marked) with string for showing how centre of gravity may be found	£0 1 9
1482	2419	Cone, for showing Equilibrium, 5 in. high, 4 in. at base, black wood	0 2 6
	2420	„ white wood	0 2 0
1483	2421	„ mahogany	0 3 6
1484	2422	Wedge and Split Block, bound with caoutchouc bands, wedge 6 in. \times 3in., block 7 in. \times 3in., black wood	0 3 6
1485	2423	„ „ mahogany	0 6 6
1486	2424	Inclined Plane, with brass roller and pulley, scale pan and 1 lb. weight, black wood	0 10 6
1487	2425	„ „ polished mahogany	0 15 0



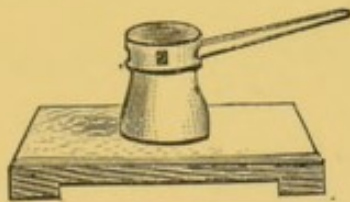
2426



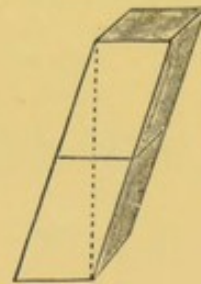
2427

Old
Cat.No.
1488

- 2426 Balance for Physical Experiments, on iron tripod support, 2 ft. high, made to unscrew at the centre for convenience of packing, with index, length of beam 2ft., pair of brass scale pans 5½ in., and small pan with hook at the bottom for taking specific gravities ... £1 10 0
- 2427 Balance, Townson & Mercer's, Brass, for Physical Experiments and Lecture, on Polished Brass Pillar, to carry 2 lbs. in each Pan, and sensible to 10 milligrammes, with Pan for Specific Gravity. Height of Pillar 21 in., diameter of Pans 5 in., length of Beam 16 in.... 2 10 0
- 2428 Set of Weights, Iron, from 1 lb. to ¼ oz. avoirdupois ¼ oz. and ½ oz. in brass ... 0 1 6

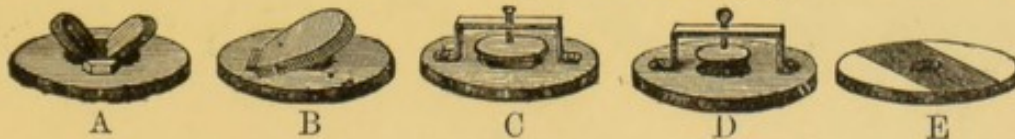


2429



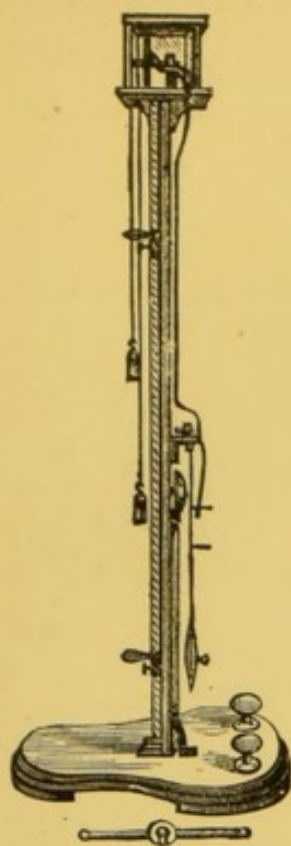
2430

- 2429 Capstan, on mahogany frame, with box wood screw and handle... £0 17 6
- 2430 Parallelopipeds or Centre of Gravity, each block 5½ in. × 4 in. × 2 in., black wood... 0 2 0
- 2431 ,, ,, polished mahogany ... 0 4 0



2432

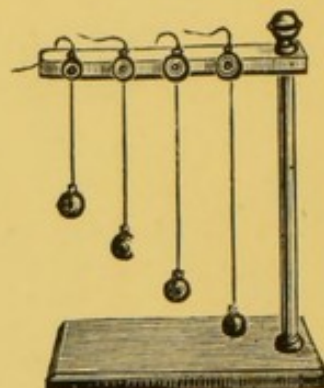
- 2432 Wood Models of Valves, diameter 5 inches. A, Butterfly Valve. B, Bellows Valve. C, Round Spring Valve. D, Conical Valve. E, Oil Silk Valve. Price for the complete set ... £0 8 6



Old Cat.No. 2433

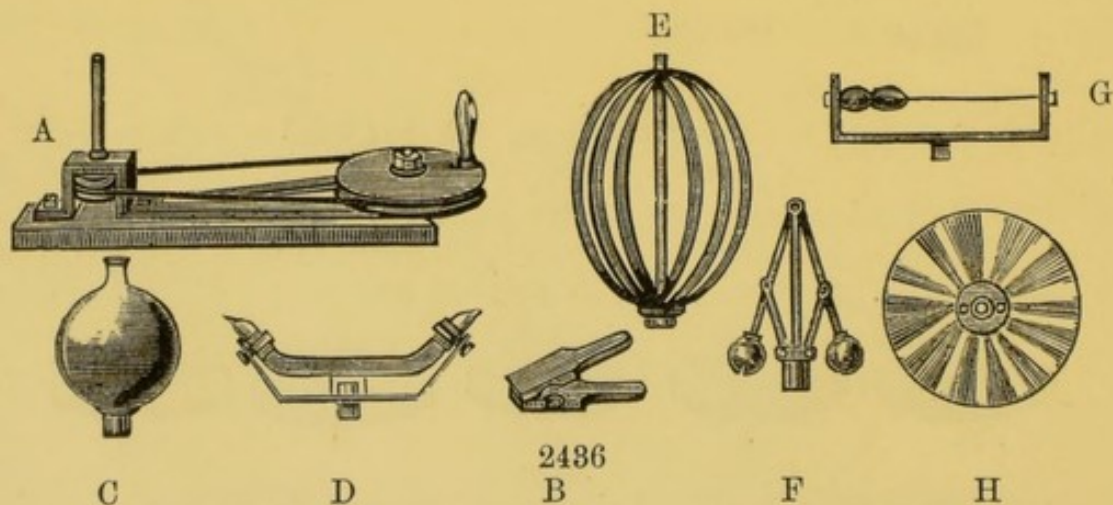


2435



2434

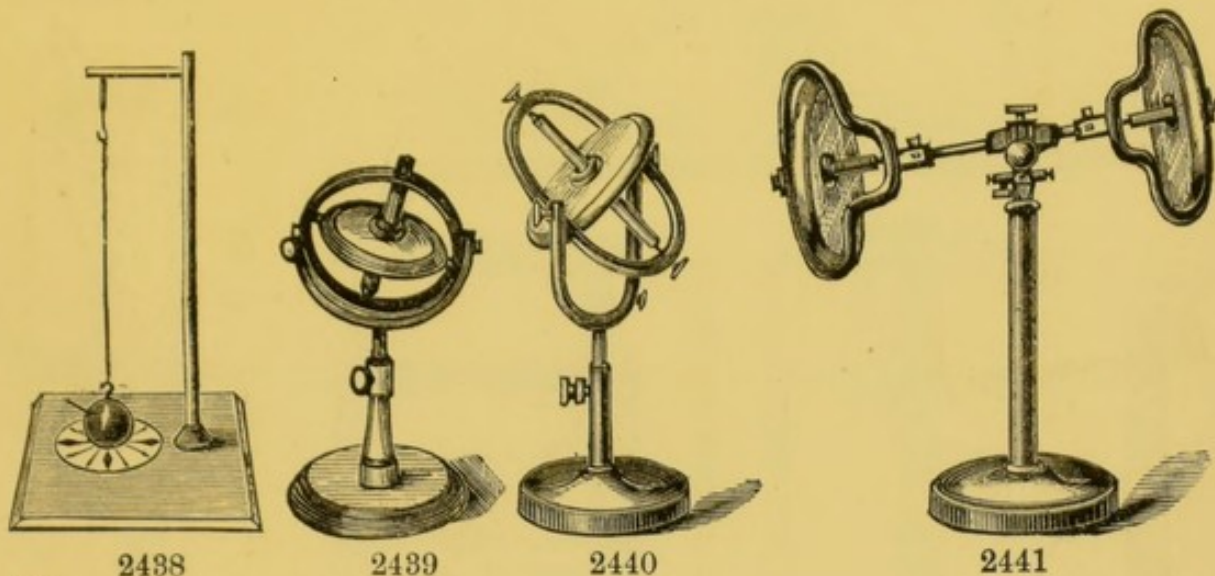
- 1494 2433 **Attwood's Machine**, for illustrating the law of falling bodies, on polished mahogany frame, 8 feet high, with centimetre graduations, large brass pendulum, and gong in glazed frame, 2 brass buckets, 3 brass weights, &c., on solid mahogany base, with levelling screws ... £12 0 0
- 1495 2434 **Apparatus for illustrating the laws of the Pendulum**, on japanned iron stand, with brass supports, the upper rail with brass screws through which the cords with brass balls may be adjusted 0 14 0
- 1496 2435 **Inertia Apparatus**, on mahogany stand, with brass supports 0 5 0



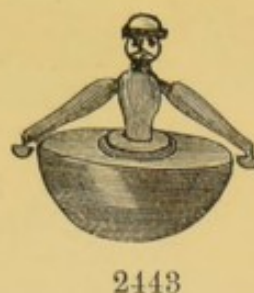
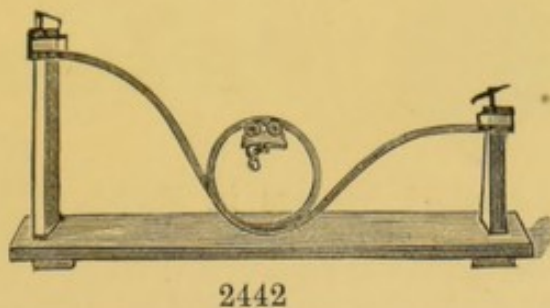
- 1498 2436 **Whirling Table**, on mahogany stand, and apparatus with 5 experiments to illustrate the laws of central force, C, glass globe for water, 3 inch diameter. D, glass

tube on Metal stand. E, brass elastic rings. F, centrifugal regulator. G, two balls on wire. H, Newton's disc, and A and B, brass tube and board for showing Tyndall's heat experiment, all the above mounted with brass female screws, to fit screw on axle pulley complete set £3 15 0

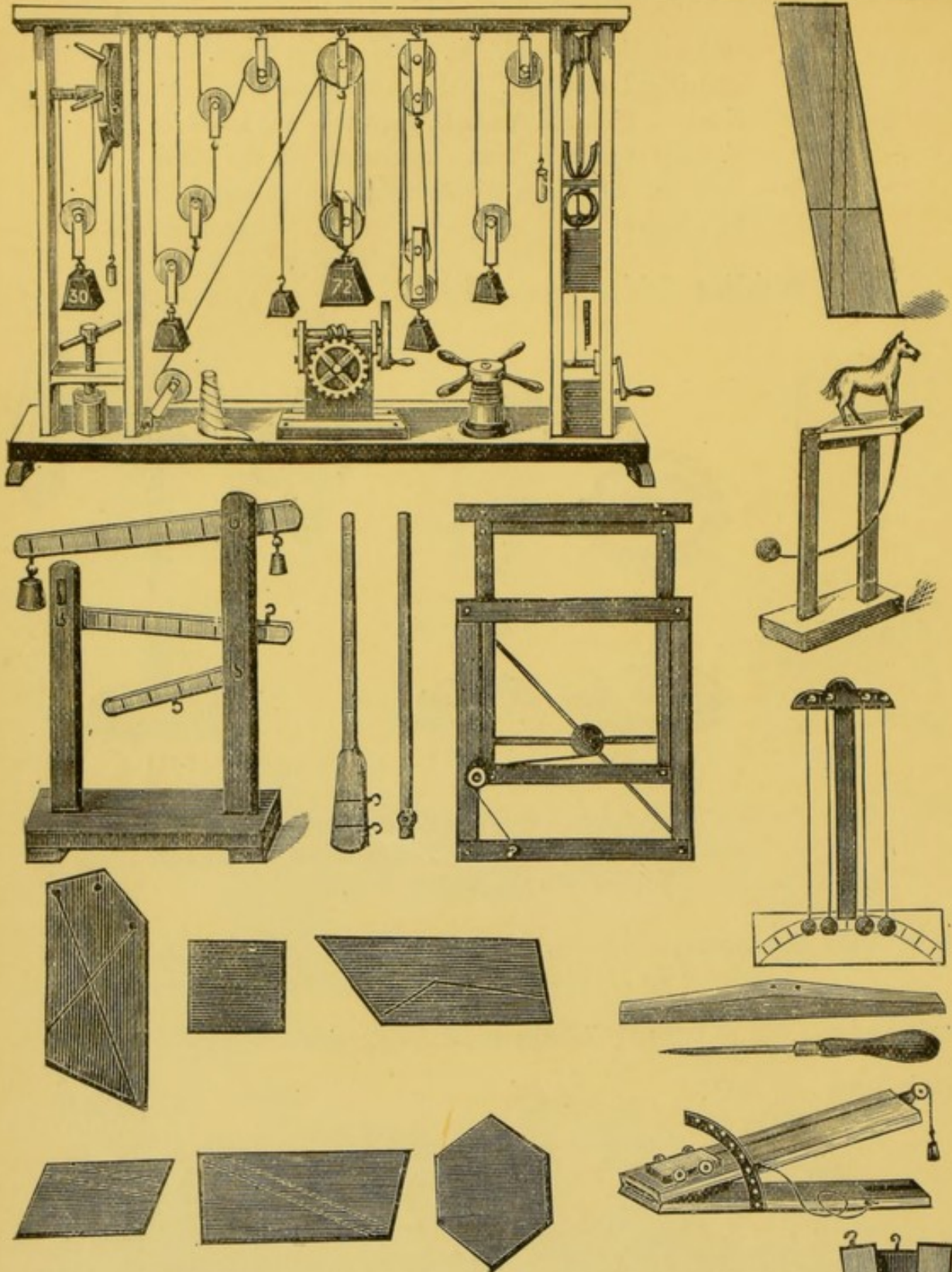
2437 Whirling Table do. larger 5 5 0



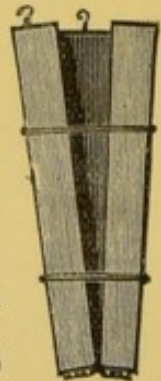
- Old Cat.No. 1499 2438 Torsion Apparatus, consisting of metal ball, with index, and graduated circle, with support on mahogany stand, to illustrate the laws of Torsion £0 17 6
- 1521 2439 Gyroscope, best make, polished gun metal, with weights, &c., to illustrate several Inertia experiments 1 15 0
- 1521A 2440 ,, best polished gun metal, with adjustable supports 1 15 0
- 1521B 2441 ,, ,, ,, ,, double ... 3 10 0



- 1522 2442 Centrifugal Railway, on mahogany stand £0 18 0
- 1523 2443 Chinese Toy, to show Equilibrium 0 2 6

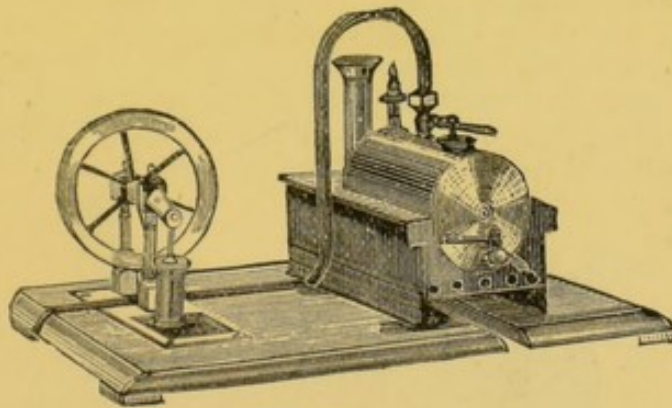


1525 2444 Set of Mechanical Powers in Polished Mahogany, consisting of Sets of Pulleys and Weights, Wheel and Compound Axle, Crank and Pile Driver, Capstan, Endless Screw and Wheel, Screw Press and Screws fitted on Mahogany Frame; also Models Illustrating Centre of Gravity, Sliding Pulley Frame, Collision Balls and Stand, Parallelo-piped, Lever Stand showing three systems, Wedge and Block, Inclined Plane, &c. Complete in Black Wood Case, with Lock and Key £5 0 0



Old
Cat.No.

- 1526 2445 **Gentlemen's Oak Tool Chest, No. 2, with Lock and Key, contains Hand Saw, Hatchet, Hammer, Mallet, Rule, Pincers, 3 Gimlets, 3 Bradawls, 2 Chisels, Gouge, 3 Files, Oil Stone, Marking Awl, Punch, Turncrew, Spokeshave, Square, Claw Wrench, Pliers, Compasses, Nails and Screws** £1 15 0
- 1527 2446 **Chest, No. 3, contains Hand Saw, Hatchet, Hammer, Mallet, Rule, Pincers, 3 Gimlets, 3 Bradawls, 3 Chisels, 2 Gouges, 3 Files, Oil Stone, Marking Awl, Punch, 2 Turncrews, Spokeshave, Square, Claw Wrench, Pliers, Compasses, Lock Saw, Plane, Nails and Screws** 2 5 0
- 1528 2447 **The Norfolk Tool Chest, No. 4, with Drawer, contains Hatchet, Hand Saw, Hammer, Mallet, Rule, Pincers, 4 Gimlets, 4 Bradawls, 4 Chisels, 2 Gouges, 3 Files, Oil Stone, Marking Awl, Punch, 2 Turncrews, Spokeshave, Square, Claw Wrench, Pliers, Compasses, Lock Saw, Plane, Marking Gauge, Glue Pot and Brush, Nails and Screws** 2 15 0
- 1529 2448 **Chest, No. 5, with Drawer, contains Hand Saw, Axe, Hammer, Mallet, Rule, Pincers, 5 Gimlets, 5 Bradawls, 5 Chisels, 3 Gouges, 4 Files, Oil Stone, Marking Awl, Punch, 2 Turncrews, Spokeshave, Square, Claw Wrench, Pliers, Compasses, Lock Saw, Plane, Marking Gauge, Glue Pot and Brush, Drawing Knife, Cutting Punch, Scraper, Bevil, Nails and Screws** 3 10 0

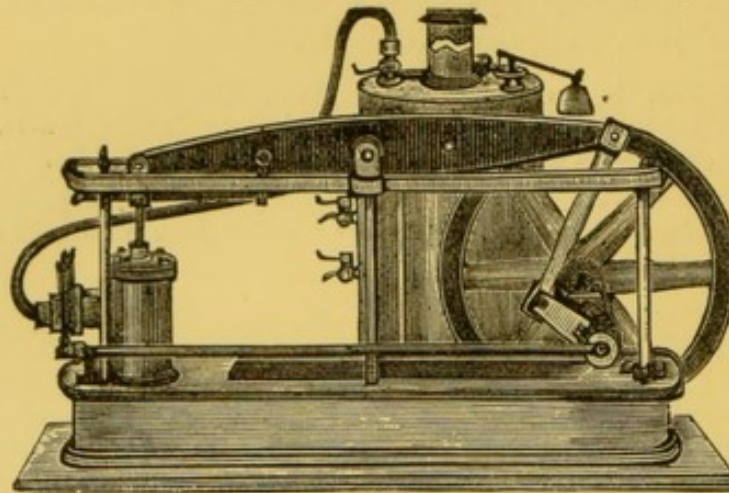


2449

- 1530 2449 **Vertical Engine, highly finished, with Brass Mounts, separate Brass Boiler, fitted with Spring Safety Valve, Steam and Gauge Taps, &c., on Polished Mahogany Board** £1 0 0
- 1531 2450 **Vertical Engine, Brass Vertical Boiler, double action Oscillating Cylinder, Taps, Valves, &c.** 1 10 0
- 1532 2451 **Horizontal Engine, with Slide Valve, Cylinder $\frac{5}{8}$ in. bore, 1 in. stroke, copper $5\frac{1}{2} \times 2\frac{1}{2}$ ins., Lever Safety Valve, 2 Water Taps, &c., with a reversing motion on Mahogany Stand** 3 0 0

Old
Cat.No.

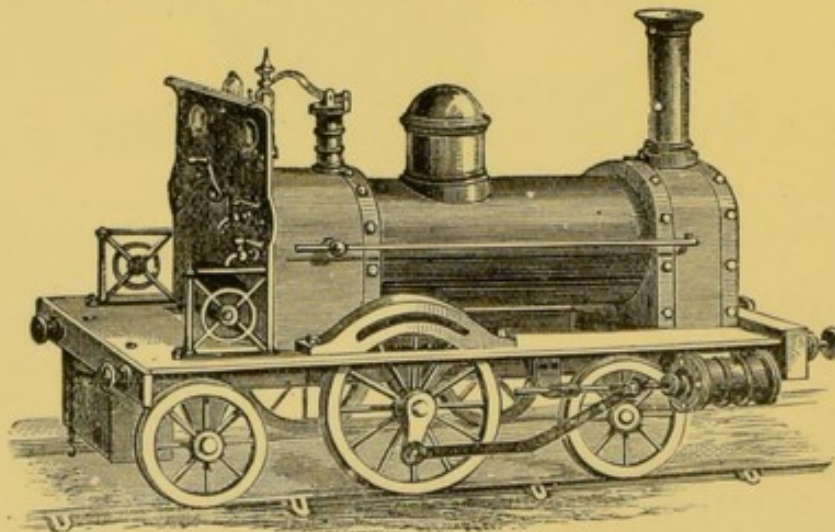
- 1533 2452 **Pump Engine**, Oscillating Cylinder, 2 Brass Supports to Wheel, Glass Cylinder, Suction Tube, Water Receiver, &c., raised Brass Horizontal Boiler, Water and Steam Taps, &c., mounted on Mahogany Stand £2 5 0



2453

- 1534 2453 **Superior Beam Engine**, with Slide Valve, Cylinder $\frac{3}{4}$ in. bore, 1 in. stroke, with Governors, Throttle Valve, parallel motion, Fly Wheel $5\frac{1}{4}$ in. diam., beam mounted on 4 Brass Pillars, bed plate on imitation brick stand, Copper Boiler $4\frac{1}{2}$ ins. diam., 6 ins., high, Lever Safety Valve, Steam Tap, &c., on polished Mahogany Stand 5 0 0

- 1535 2454 **Large Beam Engine**, extra finish, Gun Metal Cylinder, 1 in. bore, 2 in. stroke, Gun Metal eccentric and parallel motion, beam mounted on moulded frame, supported by 5 bright Iron Pillars, Iron Fly Wheel 7 in. diam., bed plate polished bright Iron, on Iron Tank, Boiler outer Copper Casing rivetted, inner Boiler Copper, 7 x 7 in. brazed, Safety Valves, &c., mounted on polished Mahogany Stand 9 10 0

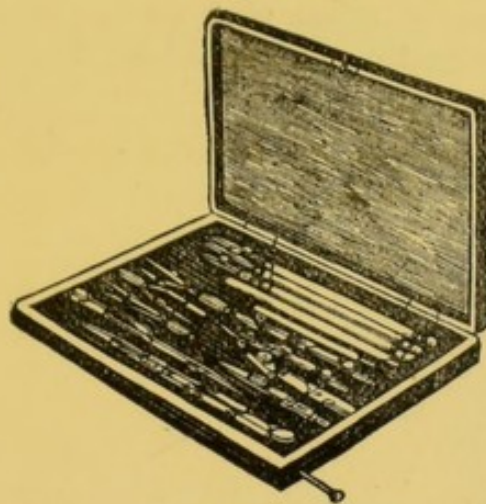


2459

- 1536 2455 **Brass Locomotive Engine**, Gun Metal Dome, Whistle, Safety Valve and Steam Tap, &c., on 4 flanged wheels, with buffers £2 0 0

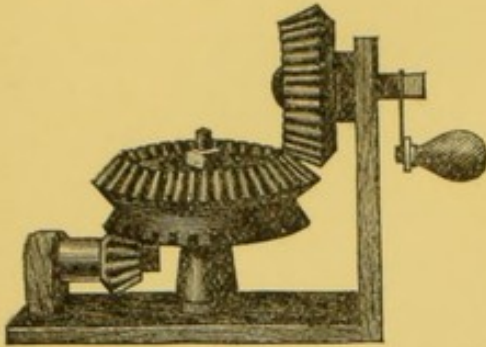
Old
Cat.No.

1536A	2456	Larger size Locomotive Engine, with Safety Valve, Water and Steam Tap, 2 Cylinders, &c., on 4 flanged wheels, with lamp	£2 10 0
1537	2457	Brass Locomotive Engine, with one Cylinder, fitted with Steam Tap, Safety Valve, &c., with 3 ft. Circular Rails	2 15 0
1538	2458	Brass Locomotive Engine and Japanned Tender, to run in a circle, or straight, Brass Boiler, $6\frac{1}{2} \times 2\frac{1}{2}$, 2 double action Oscillating Cylinders, double Steel Crank, Steam Dome, Safety Valve, &c.	5 5 0
1539	2459	Superior Slide Valve Locomotive Engine on six wheels, Polished Brass Boiler 10×3 in., Fire and Smoke Boxes, Steam Dome, Spring Lever Safety Valve, Whistle, Starting Lever, Gauge Taps, &c., to run backwards or forwards, entire length $16\frac{1}{2}$ in.	7 15 0



2460

1540	2460	Mathematical Drawing Instruments, suitable for School Classes, containing Nickel Plated Compasses, ditto with joint, for Pen and Pencil, Pen in white bone handle, case containing lead pencils, 2 palates, metal protractor, wood angle and 6 in. rule, in neat strong case lined with velvet	£0 2 6
1541	2461	„ „ larger size, and better finished, without palates	0 4 6
1542	2462	„ „ superior finish, Jointed Compass with Steel Point, extra Jointed Holder for Pencil, &c.	0 7 6
1543	2463	„ „ best finish, Compass with Steel Ends, ditto double jointed and screws for jointed pen, 2 pencils, steel pen jointed with screw, lead pencils in Nickel Silver Case, straight pen jointed in white bone handle, in leather case lined with velvet	0 12 6



2464

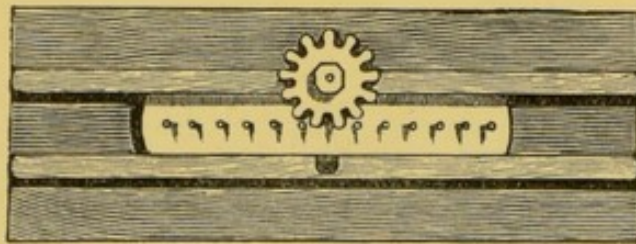


2465



2466

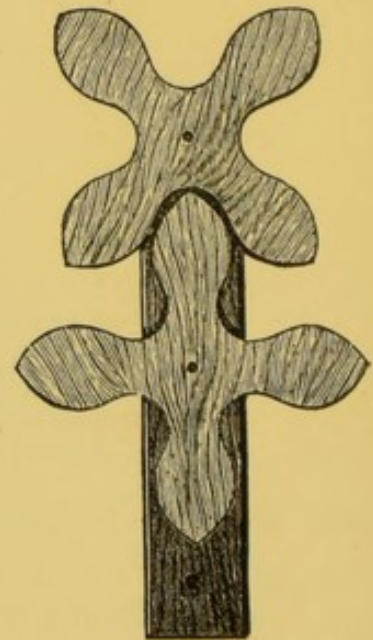
- 2464 Model, to illustrate the action of "Skew Bevels," for communicating motion between axes whose directions neither meet nor are parallel £0 17 6
- 2465 Pair of Ellipses, to explain the mode of obtaining the pitch circles of Toothed Wheels, and general principle of rolling contact 0 15 0
- 2466 Set of Three Eccentric and Elliptic Toothed Wheels ... 1 7 6



2467



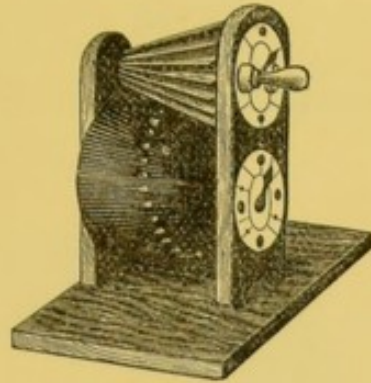
2468



2469

- 2467 Mangle Wheel, reciprocating motion £0 18 6
- 2468 Reciprocating Motion, produced by a double rack and segmental teeth 0 18 6

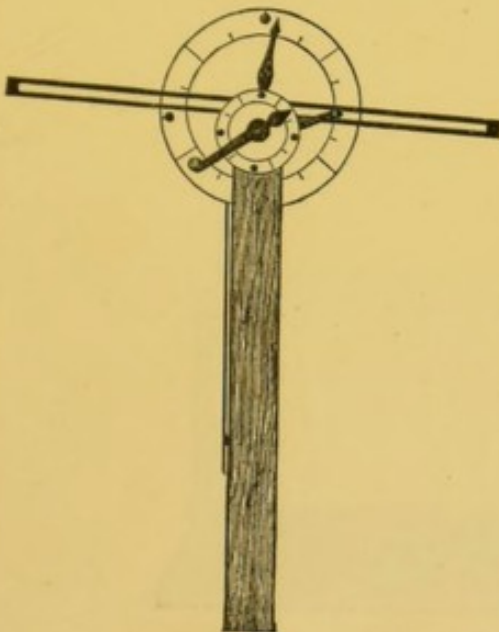
2469 **Two Spur Wheels**, of wood, with teeth of the epicycloidal form and of large size, prepared with surfaces showing the nature and direction of transmitted pressure during their sliding contact £1 0 0



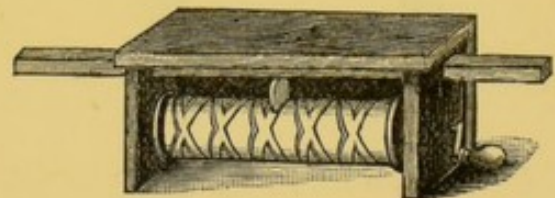
2470

2470 **Model of a Conical Toothed Wheel and Toothed Cone**, to produce a rotation with varying velocity, upon Roemer's principle... 1 7 6

2471 **Odontograph**, in Brass 1 5 0



2472



2473

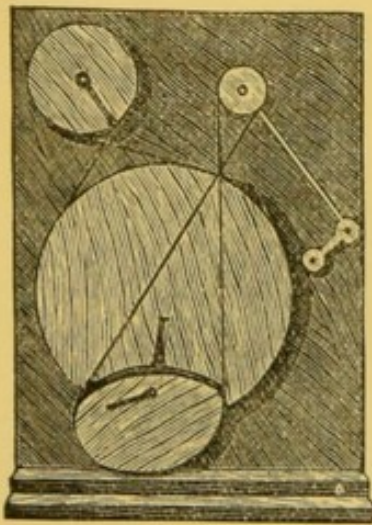


2474

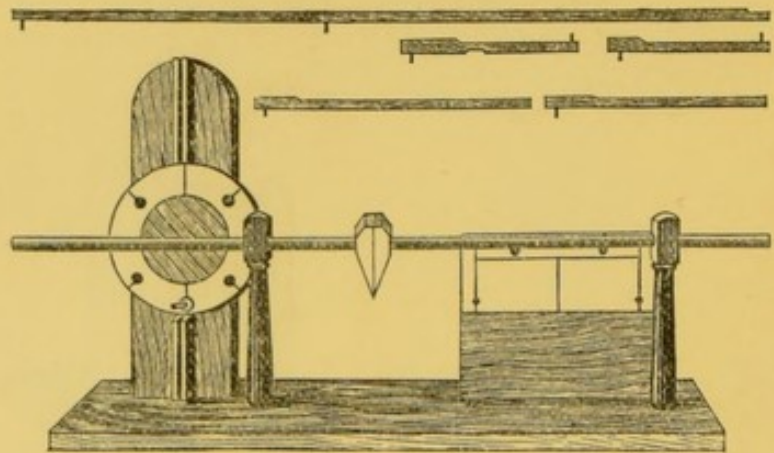
2472 **Eccentric Pin and Slit Bar**, with discs to produce rotatory or oscillatory motions by sliding contact £1 10 0

2473 **Screw**, returning into itself, used for the uniform and alternate traverse of a rod for such purposes as laying the thread on the bobbin in spinning 0 15 0

2474 **Reciprocating Motion**, produced by a triple toothed rack ; this was used about the year 1690 0 12 6

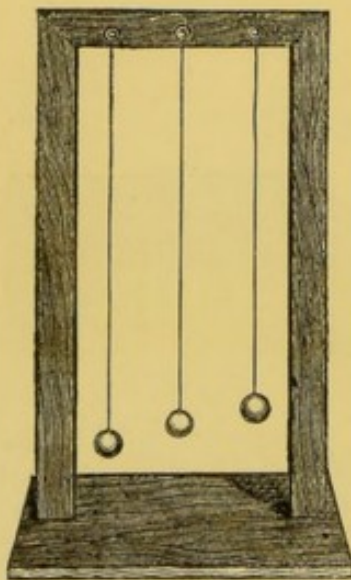


2475

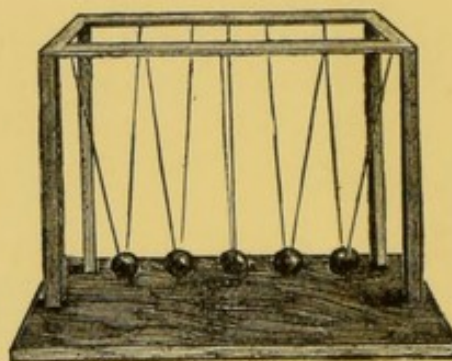


2476

- 2475 Model, to illustrate various conditions of wrapping contact or endless band motions £1 5 0
- 2476 Rod, reciprocating by means of an Eccentric Pin and Link, arranged so as to show the variations of its motion which arise from different lengths of links, and also to exhibit Booth's motion... .. 2 0 0



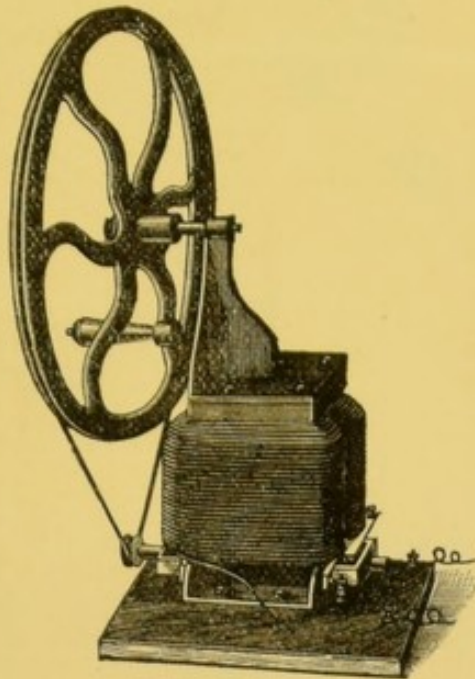
2477



2480

- 2477 Simple Pendulum, 3 Balls £0 6 6
- 2478 Compound Pendulum, 4 pieces 1 4 0
- 2479 Reversible Pendulum 2 0 0
- 2480 Apparatus for Collision, with 5 balls 0 6 6
- 2481 Model of Indicator, Richard's form, for steam 3 5 0
- 2482 Diagrams of the Steam Engine, by Professors Goodeve and Shelley, 41 diagrams, 52½ Sheets, 40 in. × 27 in.... .. 3 3 0
- 2483 Ditto, ditto, varnished and mounted on Rollers 8 13 0

HAND DYNAMO MACHINES.



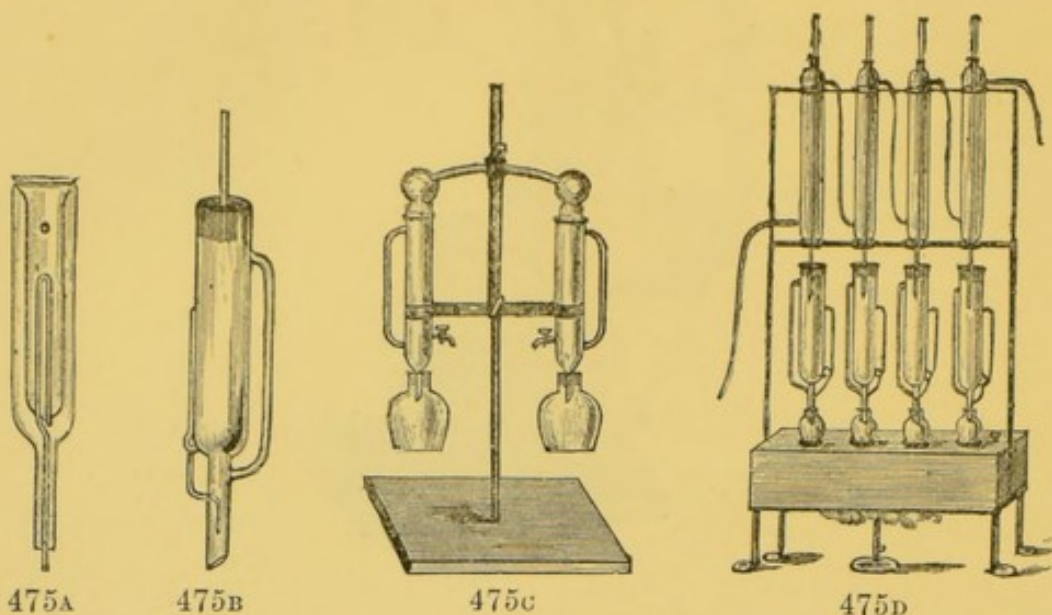
2484

- 2484 **Hand Dynamo Machine, No. 1**, suitable for Lecture purposes.
This machine will give a current equal to five pint Bunsen's Batteries, and will light two 5-candle-power lamps, and is wound with silk covered wire £4 4 0
- 2485 Ditto No. 2, equal to ten Bunsen's pint batteries, and will light six 5-candle-power lamps of 12 Volts; it has a laminated armature which is non-heating, and is wound with silk covered copper wire 6 6 0
- 2486 Ditto No. 3, with foot treadle for driving, equal to twenty Bunsen's pint batteries, and will work four to five 10-candle-power lamps of 20 Volts, armature, &c., as described above 10 10 0

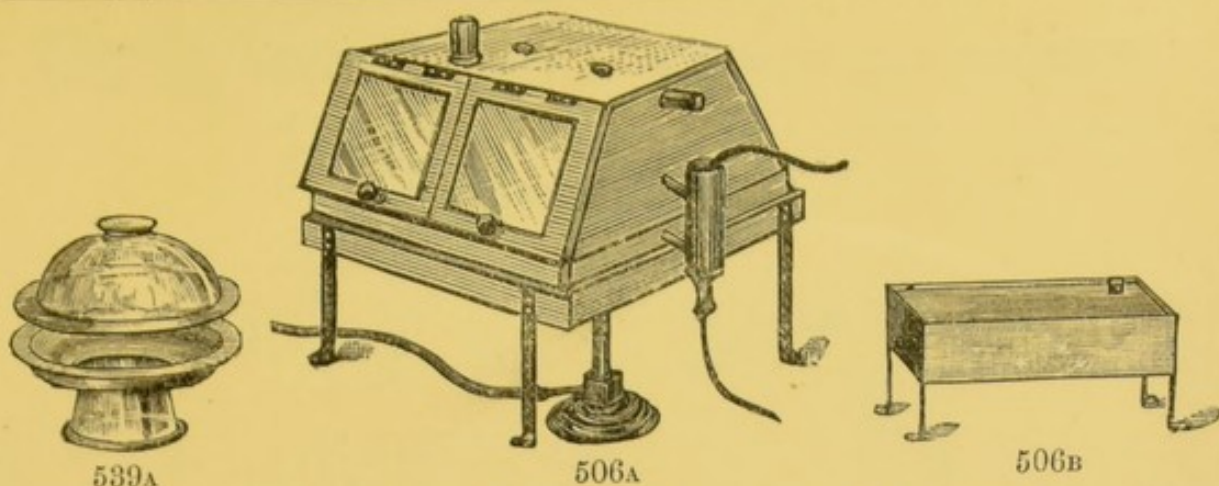
Dynamo Machines, larger sizes—

NUMBER OF LAMPS 20 C.P.	H.P. REQUIRED	PRICE
5	$\frac{1}{2}$	£14 10 0
10	1	22 10 0
20	2	37 10 0
25	$2\frac{1}{2}$	51 0 0
30	$3\frac{1}{4}$	60 0 0

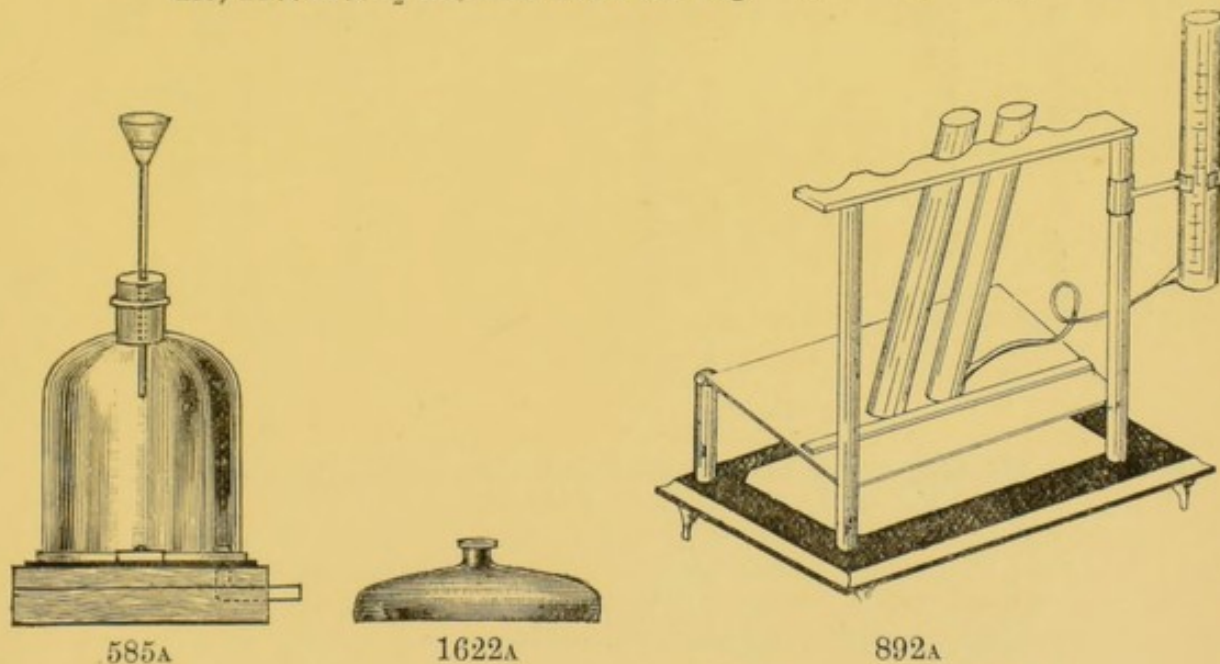
A D D E N D A .



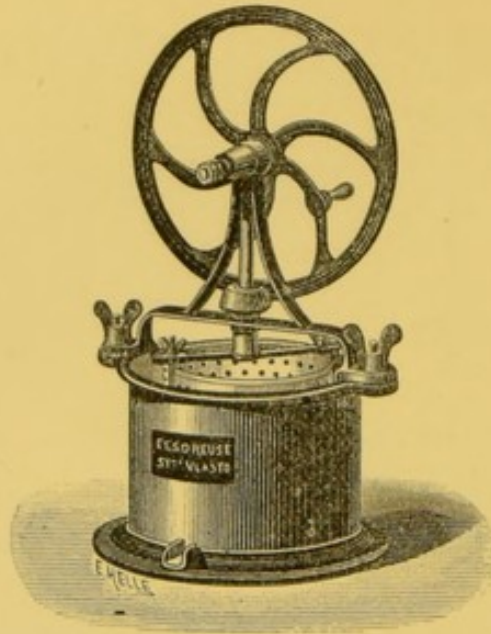
460A	Pencils, Blue or Yellow, for writing on glass	...	each	£0	0	6
475A	Blounts Soxleth's Fat Extraction Apparatus	...	...	0	4	0
475B	Soxleth's Fat Extraction Apparatus, with Tubulure and Stopper at top accurately ground	...	...	0	5	0
475c	Yardley's Fat Extraction Apparatus with Stoppered Condensing or Connecting Tube, accurately ground in to the top of both Cylinders	...	...	0	16	0
	Stand with Clamps	...	...	0	7	4
475D	Iron Stand with Copper Water Bath, arranged for a series of Butter or Fat Extractions, the four (or more if required) inner and outer Tubes of the Condensers are connected with India Rubber Tube; the Copper Water Oven is supplied with India Rubber Rings for the support of the flasks, also with covers so that one or more can be in use. The Stand is made so as to screw on to bench; the upper rings are moveable. Size of Copper Oven 18 × 6 × 4 in. Height of Stand 40 in. Price for Stand and Copper Oven	...	...	2	10	0



- | | | |
|------|--|--------|
| 539A | Desiccator, Bohemian Glass, new form, accurately ground, with flat knob at top ground for writing upon or labelling | £0 5 0 |
| 506A | Copper Water Drying Oven, on Iron Stand, arranged by Prof. Reynolds, Trinity College, Dublin Size of base 17 in. × 14 in., height to top of oven 9 in., with four compartments and glass doors on hinges, with shelves inside for funnels, &c., and water level. Price, without burner ... | 5 0 0 |
| 506B | Copper Forcing Tray, with rim, on Iron Stand, for Brewers' use, 18 × 12 × 2½ in., with Draw-off Tap | 2 0 0 |

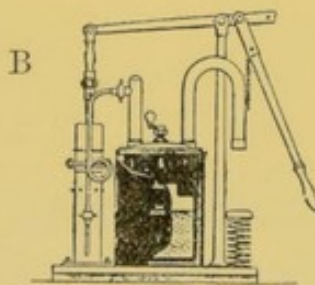


- | | | |
|-------|--|--------|
| 585A | Quick Filtering Apparatus, consisting of Bell Jar, Long Tube Funnel, and Perforated Porcelain Plate; a Sheet of India Rubber is fastened to the Wooden Support, in which is inserted a Bent Tube for attaching to Pump ... | £0 7 6 |
| 1622A | Flasks, Shallow and perfectly Flat at Bottom, for cultivation of Bacteria, 8 oz. capacity each | 0 0 8 |
| " | " " " 16 oz. " " | 0 1 0 |
| 892A | Stokes' Colorimeter, two Nessler Tubes with Tubulure at side, one graduated, Glass Plate on Frame acting as support also for observation, over White Opaque Glass, complete, with two extra Nessler Tubes | 0 16 0 |

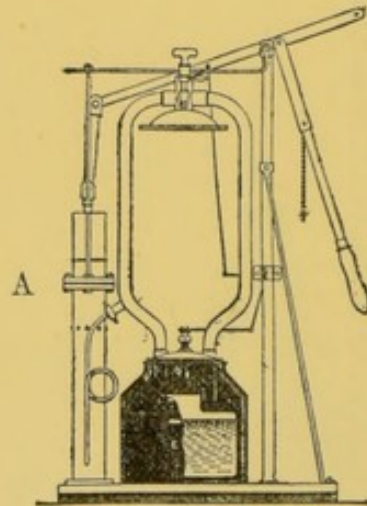


2487

2487 **Vlasto's Practical Hydro Extractor.** A simple Apparatus for Drying Chemicals which cannot be either dried or pressed by ordinary means. The Apparatus is light and of simple construction, and cannot be easily damaged. The Bucket is of enamelled iron, and Basket china or enamelled tin, and is therefore specially adapted for drying Acids or Alkalies; it will also be found very useful in Pharmaceutical Laboratories or Sugar Factories £3 5 0



2488



2489

2488 **Fleuss' Patent Hand Ice-Making Machine,** Pattern B, is very portable, simple, and compact. It is especially suitable for Yachts and the Camp. It will Ice drinking Water or Still Wines, and by means of the Jar and Cover (15/ extra) Block Ice and Ice Creams can be made and the Butter Iced for Table. An attachment for Iceing Bottled Wines, Beer, &c., price 10/ extra; Ice Cream Jar, 5/ extra. Height 24 x 16 x 11 in. price £6 6 0
Weight, packed for Shipment, about 85 lbs.

2489 **Fleuss' Ice Machine**, pattern A, is the most suitable for export, hot climates, and domestic use, and will ice drinking Water, Butter for the table, and will make Ice Creams, or Block Ice. The Absorber is made to contain about 5 quarts of Sulphuric Acid.

Height 37 × 22 × 12½ ins. price £10 10 0

Special Glass for making one quart of Ice Cream at a time extra 0 5 0

Special Zinc Vessel for Icing Wine, Beer, &c., in Bottles extra 0 10 0

Weight, packed for Shipment, 150 lbs.

Instruction Book sent out with each Machine, and every Machine is Tested before leaving the factory. Larger Machines made to order.



2490

Yardley's Patent Contact Apparatus. The advantage in the use of these is that there are no springs used in their construction, contact being made and broken by means of a metallic sphere.

2205A Pushes, Polished Wood for Bells, &c. each 0 1 9

2221A Switches, Polished Wood ,, 0 1 9

2224A Burglar Alarms, for Doors or Windows ,, 0 1 3

2224B Short Circuit Switches, for fixing to Bells, so that when once set ringing by any of the above Communicators they will continue to do so, whether communication be shut off or not (The Bell requires a piece of Wire to be firmly attached to the hammer) 0 2 6

CATALOGUE OF CHEMICAL AND PHYSICAL APPARATUS,

As used and recommended by the Science and Art Department.

The following Prices are subject to a Cash Discount of 10 % to Institutions, &c., if accompanied with the Department Requisition. Platinum and Balances excepted.

Department Number	SUBJECT VIII. SOUND.	Townson and Mercer's Catalogue Number.	Price.			Highest Price on which the Departmental Aid of 50 per cent. is allowed.		
			£	s.	d.	£	s.	d.
	APPARATUS FOR THE ELEMENTARY STAGE.							
1	Air pump	1752	3	10	0	5	0	0
2	Alarum	1761	0	5	6	0	5	0
3	India rubber tubing, 36 feet	1532	0	15	0	0	18	0
4	Wooden trough, glass front, 48 × 6 × 6 in.	2022	0	12	0	0	12	0
5	Round zinc trough, 24 × 18 in. ...	2023	0	16	0	1	0	0
6	" " " 18 × 18 in. ...	2024	0	12	6	0	13	0
7	Zinc trough, 24 × 12 × 18 in. ...	2025	0	16	0	0	19	6
8	Wooden block, with handle, 5 $\frac{3}{4}$ × 4 × 4 in. ... ..	...	0	1	6	...	...	...
9	Box for shewing vortex rings	2006	0	7	6	0	5	0
10	Boyle's tube on board, with scale ...	...	0	5	0	0	5	0
11	Fire syringe	1904	0	5	6	0	5	0
12	2 tuning forks in unison ... ..	...	0	8	0	0	8	0
13	1 ditto an octave higher ... ..	...	0	4	0	0	8	0
14	Deal rod, 12 ft. × 1 × 1 in. uncovered	2036	0	1	6	...	...	...
15	" 12 ft. × 1 × $\frac{1}{2}$ in.	2037	0	1	3	...	...	...
16	Deal sounding board, 24 in. square ...	2035	0	4	6	...	...	...
17	2 tin tubes, 36 × 4 in.	2042	0	6	0	0	6	0
18	Handbell... ..	...	0	6	0	...	...	...
19	Humming top, fitted with iron plate pierced with 2 rows of holes	2018	0	5	6	0	5	0
20	Iron table, vice, and cork-lined clamp	...	0	8	0	0	12	0
20A	Square plate of glass or brass ... ..	...	3/	&	5/	...	...	...
21	Violin Bow ... ..	...	0	4	0	0	4	0
22	Monochord and 2 sets of brass and steel wires	2032	1	1	0	0	10	0
23	Set of weights, 3 of 10 lbs. and 1 of 20 lbs.	2034	0	1	3	...	...	...
24	2 round deal rods, 6 ft. × $\frac{1}{2}$ in. ...	2038	0	1	3	...	...	...
25	2 " oak " 6 ft. × $\frac{1}{2}$ in. ...	2039	0	1	6	...	...	...
26	Brass Tube, 3 ft. × $\frac{1}{2}$ in.	2040	0	1	6	...	...	...
	APPARATUS FOR ADVANCED STAGE.							
27	Pair of telephone models ... ..	...	...	...	...	...	...	...
28	Hopkin's forked tube	2015	0	6	0	0	6	0
29	Organ pipe for illustrating nodes ...	2010	2	5	0	2	0	0
30	Siren, with indicator	2041	...	...	...	2	5	0
30A	Savart's wheel	2020	2	10	0	2	0	0
31	Speaking trumpet	2051	0	3	6	0	5	0
32	Manometric flame apparatus	2019	2	0	0	2	0	0
33	Cladni's plates	2028	0	15	0	0	15	0
34	Sensitive burners ... ..	...	0	10	0	0	10	0

Department Number	LIGHT.	Townson and Mercer's Catalogue Number.	Price.			Highest Price on which the Departmental Aid of 50 per cent. is allowed.		
			£	s.	d.	£	s.	d.
	APPARATUS FOR THE ELEMENTARY STAGE.							
40	Phosphorescence tube ... ..	...	0	3	6	...	...	...
41	Lantern	1986	4	10	0	6	6	0
42	2 Gas bags, with taps	801	4	18	0	6	0	0
43	Set of lenses	1959	1	1	0	1	0	0
44	Frame for holding lenses	1961A&B	0	6	6	0	5	0
45	Concave mirrors, glass (2)	1954	0	18	0	1	10	0
46	Convex ,, ,,	1954	0	18	0	1	10	0
47	2 wedge-shaped cells	1950	0	9	0	0	9	0
48	2 flat glass cells	1949	0	6	0	0	5	0
49	Model of eye on foot	1970	0	10	0	0	10	6
50	Newton's colour disc, with spinning top ... ..	...	0	5	0	0	2	6
51	Semicircular tray, 24 in. diam., 4 in. deep, with glass window	1997	0	10	0	0	10	0
52	Glass trough, 5 divisions	1951	0	7	0	0	6	0
53	Carbon disulphide prism	1975	0	10	0	0	10	0
54	Prisms, triangular 8/6, right-angled 1 in. 8/, obtuse 5/, Nicol's prism 7/6 ... ..	...	1	9	0	0	10	6
55	2 ground glass globes ... ..	...	0	1	6	...	...	...
56	Coloured glass slips, 6 in. square ... ..	...	0	3	6	0	5	0
57	Blackened glass ... ..	...	0	1	0	...	...	...
58	Models of sextant and reflecting circle	1983	0	6	0	0	5	0
	APPARATUS FOR THE ADVANCED STAGE.							
60	Polariscope ... ..	...	5	0	0	1	0	0
61	Plates of quartz, aragonite, calcite, selenite, and nitre	1984	1	10	0	1	0	0
62	Muller's reflection apparatus (model)... ..	...	0	10	6	0	6	0
63	Table spectroscope	1989	5	0	0	5	0	0
64	Camera lucida	1948	2	10	0	2	10	0
65	Camera obscura... ..	1947	0	12	6	0	12	6
66	Photometer	1965	2	15	0	1	0	0
67	Stereoscope	1969	0	10	6	1	0	0
68	Apparatus to shew Newton's rings	1962	0	10	6	0	10	0
69	Two rhombs of Iceland spar	1985	1	10	0	1	0	0
70	Tourmaline pincette	1995	0	17	6	0	10	6
71	Obtuse angle prism	1980	0	5	0	0	7	6
72	Indigo prism	1996	0	4	0	0	5	0
73	Grove's or Bunsen's battery (4 cells)	2236	1	16	0	3	10	0

Department Number	HEAT.	Townson and Mercer's Catalogue Number.	Price.			Highest Price on which the Departmental Aid of 50 per cent. is al- lowed.
			£	s.	d.	
APPARATUS FOR THE ELEMENTARY STAGE.						
80	Cryophorus	1925	0	2	6	0 5 0
81	Water hammer	1921	0	1	6	0 5 0
82	Differential thermometer	1493	0	4	0	0 5 0
83	Thermometer	1476	0	4	0	0 5 0
84	Unequal expansion bar ... ..	...	0	1	6	0 1 6
85	Contraction apparatus with bars	1886	0	9	0	0 9 0
86	Metal bar and gauge to show expansion... ..	1906	0	5	6	0 5 0
87	Gravesande's ring	1909	0	3	6	0 5 0
88	Concave tin reflectors (2)	1938	1	2	6	1 5 0
89	Set of iron balls, 4 lbs. to $\frac{1}{4}$ oz., with ring handles	1891	0	5	6	0 5 0
90	Stand for ball	1892	0	2	0	0 2 0
91	Copper ball, 5 lbs., with ring handle	1890	0	8	6	0 7 0
92	Set of cylinders, copper, tin, lead, iron, zinc, bismuth, cork and wood	1893	0	7	6	0 6 0
93	Regnault's hydrometer ... ..	...	0	5	0	0 5 0
94	Leslie's cube	1916	0	2	0	0 2 6
95	Thermometer tubes (3)	1496	0	1	6	0 1 6
96	Barometer tubes (3)	1884-1885	0	3	0	0 3 0
APPARATUS FOR THE ADVANCED STAGE.						
100	Thermopile (20 pairs)	1931	1	7	6	1 5 0
101	Galvanometer	1935	2	0	0	1 0 0
102	Radiometer	1993	0	5	0	0 10 6
103	Apparatus for shewing absolute expansion of liquids	1888	1	0	0	1 0 0
104	Liquid conductivity cones ... ..	...	...	...	...	0 5 0
105	Ferguson's pyrometer	1903	1	10	0	1 11 6
106	Mercury trough... ..	1135	0	3	0	0 6 0
107	Safety lamp	1899	0	8	6	0 12 6
108	Balance	45	1	15	0	1 10 0
109	Set of weights, 100 grammes to .01 gramme, or 1,000 grains to 1 grain ... ..	...	0	7	6	0 7 6

Department Number	GENERAL APPARATUS.	Townson and Mercer's Catalogue Number.	Price.	Highest Price on which the Departmental Aid of 50 per cent. is allowed.		
				£	s.	d.
120	Retort stands (2)	1312-1311	8/6 & 4/6	0	10	0
121	Wooden supports (2)	1345-1346	6/ & 3/	0	15	0
122	Crook supports (2)	1353	1/9 each	0	5	0
123	Tripod, iron	1362	1/	0	2	6
124	Bunsen's burners (2)	989	1/3 & 2/6	0	7	6
125	Spirit lamp, 4 ozs.	967	1/	0	2	9
126	Test tube (3 dozen) various sizes, 5 × $\frac{5}{8}$ to 6 × $\frac{3}{4}$	1426	2/			
127	Set (6) beakers, 0 to 5	208	2/2			
128	Funnels (3) 4 in. to 1 in.	642	9d.			
129	1 doz. flasks, assorted sizes, 4 to 30 oz.	588	4/6			
130	3 lbs. glass tubing	810	1/ per lb.			
131	1 lb. glass rod	819	1/ per lb.			
132	Wide mouth bottles, 1 doz., wood top	314	2/6			
133	Watch glasses, $\frac{1}{2}$ doz.	1687	1/			
134	Strips of plate and crown and looking glass, 4 × 4 in.		1/			
135	Plate of ground glass, 10 in. square ...		1/6			
136	Platinum wire		2/			
137	India rubber tubing, red, $\frac{5}{16}$ bore ...	1532	5d. per ft.			
138	Tin foil		1/6 & 2/6	per lb.		
139	1 piece wire gauze, fine, 6 in. square ...	1696	4d.			
140	" " coarse " "	1697	4d.			
141	Iron and copper wire		1/ & 1/6	per lb.		
142	Iron plate, 12 in. square		1/			
143	4 saucepans		2/6			
144	Pieces of cork		6d.			
145	Mercury (varies)		3/ per lb.	2	0	0

MATERIALS AND CHEMICALS.

Lime water, 4 oz.	Potassium permanganate, sol., 10 oz.	Sugar, 1 lb.
Powdered lime, 4 oz.	Fluorspar, powdered, 4 oz.	Tincture of iodine, 1 oz.
Sodium carbonate, 2 oz.	Nitric acid, 1 pint	Sulphur, stick and powder
Tartaric acid, 2 oz.	Hydrochloric acid, 1 pint	Resin, powdered, 1 oz.
Ether, 3 oz.	Sulphuric acid, 1 pint	Wash-leather
Turpentine, 2 oz.	Methylated alcohol, 1 pint	Silk thread
Benzine, 2 oz.	Nitre, 1 lb.	Flannel
Alcohol, 2 oz.	Salt, 1 lb.	Isinglass, 2 oz.
Carbon disulphide, 6 oz.	Sodium sulphate, 1 lb.	Acetic acid (glacial), 3 oz.
Copper sulphate sol., 10oz.	Sal-ammoniac, 1 lb.	Coloured card
Silver nitrate, $\frac{1}{2}$ oz.	Copper turnings, 2 oz.	Ice
Bone ash, 7 oz.		Sand

Price for the above 16/, exclusive of bottles.

These articles will be required for the performance of experiments in this subject. They are accordingly added to the Catalogue as a guide to the purchaser. The Department does not grant aid towards their purchase.

APPARATUS AND MATERIALS FOR TEACHING THE ELEMENTS OF MAGNETISM AND ELECTRICITY.

Department Number	MAGNETISM.	Townson and Mercer's Catalogue Number.	Price.			Highest Price on which the Departmental Aid of 50 per cent. is al- lowed.
			£	s.	d.	
APPARATUS FOR THE ELEMENTARY STAGE.						
1	Piece of magnetic iron ore ... ..	...	0	5	0	0 5 0
2	Magnetic needle, on vertical pivot ...	2350	0	4	0	0 5 0
3	Dipping needle	2355	0	7	6	0 7 6
4	Pair of bar magnets	2344	0	3	0	0 10 6
5	Horseshoe magnet	2343	0	1	9	0 2 6
6	Iron and steel filings ... ..	...	6d. per lb.			...
7	Pieces of soft iron ... ..	...	0	1	0	...
8	Knitting needles ... ..	...	0	0	6	...
9	Compass card ... ..	...	0	0	6	...
APPARATUS FOR ADVANCED STAGE.						
11	Astatic needle	2352	0	7	6	0 10 6
12	Large electro-magnet	2342	1	1	0	1 10 0
13	Bars of antimony, bismuth and nickel	2276	0	4	6	...

FRICTIONAL ELECTRICITY.

APPARATUS FOR THE ELEMENTARY STAGE.

20	Electrical glass tube	2184	0	2	6	0 3 6
21	Fur and silk rubbers ... ..	...	0	3	6	...
22	Stick of shellac	2178	0	1	6	0 2 6
23	Stick of sulphur	2180	0	2	6	0 2 0
24	Stick of sealing wax	2178	0	1	6	0 2 6
25	Brass tube or rod with rounded ends ...	2177	0	2	0	0 2 0
26	Electrical machine, plate or cylinder, or	2055-2058	...			5 0 0
26A	Winter's electrical machine ... ..						2071
27	Amalgam ... ..	...	6d. per oz.			...
28	Electroscope	2124	0	7	6	0 7 6
29	Leyden jars (4 two-pint in tray) ...	2154	1	5	0	1 10 0
30	Leyden jar, with moveable coating ...	2156	0	7	6	0 7 6
31	Discharger	2114	0	6	6	0 5 0
32	Sheet of caoutchouc ... ..	...	0	2	0	...
33	Electrophorus	2129	0	10	0	0 10 0
34	Pith ball electrometer	2117	0	1	3	0 2 6
35	Insulating stand	2189	0	6	0	0 7 6
36	2 conductors, cone, cylinder, and balls to fit on stand ... ..	...	0	7	6	0 7 6
37	Roll of tin foil on glass tube ... ..	...	0	2	0	0 2 0
38	Fulminating pane with silk handles ...	2138	0	4	6	0 5 0
39	Electric whirl	2195	0	2	6	0 2 6

Department Number	FRICTIONAL ELECTRICITY, <i>Continued.</i>	Townson and Mercer's Catalogue Number.	Price.	Highest Price on which the Departmental Aid of 50 per cent. is allowed.
				£ s. d.
APPARATUS FOR THE ADVANCED STAGE.				
41	Bohnenberger's electroscope	2128	£ 3 10 0	0 15 0
42	Electrical machine, Voss or Wimshurst	2072-2087	...	6 10 0
43	Thomson's quadrant electrometer	2120	6 6 0	6 0 0
44	Henley's universal discharger	2116	1 10 0	0 10 6
45	Faraday's butterfly net	2134	0 4 6	0 4 6
46	Coulomb's torsion balance	2119	3 15 0	4 0 0
47	Aurora flask	2089	0 7 6	0 7 6
48	Bucket and syphon	2098	0 3 6	0 3 6
49	Unit jar	2139	0 16 0	0 4 6

VOLTAIC ELECTRICITY.

APPARATUS FOR THE ELEMENTARY STAGE.

51	Strips of copper and zinc ... ..	...	...	...
52	Daniell's cell	2234	5/ & 6/	...
53	Smee's cell	2241	0 6 0	...
54	One metal cell ... ..	...	...	...
55	Bunsen's battery	2232	5/ & 6/	...
	" "	2233	3 10 0	...
	Grove's "	2236	1 16 0	...
56	Copper covered wire, cotton (No. 18)...	2374	2/3 per lb.	...
57	" " " silk (No. 20)...	2377	5/	...
58	" " " gutta percha	2379	2d. per yd.	...
59	Oersted's experiments	2356	0 3 6	...
60	Floating battery	2244	0 5 6	...
61	Electro magnet	2340	0 7 6	...
62	Electrolysis apparatus	{ 2310	8/6&10/6	...
		{ 2311	1 5 0	...
63	Pair of flat spirals, on boards	2363	0 5 0	...
64	Galvanometer	{ 2324	0 7 6	...
		{ 2326	0 12 6	...
65	Model of single needle telegraph	2319	0 12 6	...
66	Induction coil	2299	2 2 0	...
67	Mercury (price varies) ... ..	...	and upwards 3/ per lb.	...

Department Number	VOLTAIC ELECTRICITY, <i>Continued.</i>	Townson and Mercer's Catalogue Number.	Price.			Highest Price on which the Departmental Aid of 50 per cent. is allowed.		
			£	s.	d.	£	s.	d.
APPARATUS FOR THE ADVANCED STAGE.								
71	Bichromatic battery	2229	0	7	0	0	7	6
72	Leclanché battery	2240	0	4	6	0	4	6
73	Electric bell	2203	0	5	6	0	5	0
74	Wheatstone's bridge	2358	2	5	0	2	10	0
75	Set of resistance coils	2357	5	5	0	5	0	0
76	Commutator	2307	0	10	6	0	10	0
77	Tangent galvanometer	2327	3	15	0	5	0	0
78	Chain of alternate links, silver and platinum	2279	5/6 & 9/			0	6	6
79	Apparatus to shew currents produced in a copper disc, rotating between the poles of a magnet	2273	2	0	0	2	0	0
80	Barlow's wheel	2274	0	10	6	0	12	6
81	Magneto-electric machine	2348	2	2	0	2	10	0
82	Thermo-electric pair	2364	0	8	6	0	10	6
83	Secondary battery	2397	0	15	0	1	0	0
84	Electric lamp	2318	7	0	0	6	6	0
85	Astatic galvanometer	2332	1	5	0	1	5	0
		2333	2	0	0			
86	Reflecting galvanometer and scale	2398	7	10	0	1	10	0
		2399	2	10	0			
87	Rheostat... ..	2359	1	10	0	3	0	0

MATERIALS AND CHEMICALS.

	£	s.	d.		£	s.	d.	
Glass rod, 2 lbs., various sizes	0	2	0	Iron ball ... ..	...	...	...
„ tube, 1 lb.	0	1	0	Iron hook for above ... ..	...	...	...
India rubber tubing, $\frac{5}{8}$ in. diam., 6 in.	0	0	6	Insulating hook ... ..	...	...	...
Sheet of vulcanite or gutta-percha	0	1	0	Lath, 4 ft. ... ..	...	...	...
Iron binding wire	0	0	3	Wood rod ... ..	...	...	...
Copper wire	0	0	6	Tinfoil ... ..	...	0	0	6
Platinum wire, fine, 6 in.	0	0	3	Resin ... ..	...	0	0	4
Unspun silk	0	0	4	Collodion, 1 oz. ... ..	...	0	0	2
White silk ribbon, 1 yard	0	0	4	Red lead powder, 1 oz. ... ..	...	0	0	2
Mahogany board, 12 in. square	...	...	...	Sulphur flour, 1 oz. ... ..	...	0	0	2
4 varnished tumblers ... ..	...	...	...	Gunpowder, 1 oz. ... ..	...	0	0	2
Piece of flannel	0	0	6	Starch powder, 1 oz. ... ..	...	0	0	2
Piece of muslin	0	0	3	Potassium iodide, solution, 1 oz.	0	0	6	
Book of gold leaf, or imitation gold leaf	0	0	2	Sulphuric acid, 1 pint ... ..	...	0	0	4
Metal tray ... ..	...	...	...	Nitric acid, 1 pint ... ..	...	0	0	9
				Copper sulphate, 1 lb. ... ..	...	0	0	5
				Potassium bichromate, $\frac{1}{2}$ lb. ...	0	0	4	
				Ammonium chloride, $\frac{1}{4}$ lb. ...	0	0	3	

These articles will be required for the performance of experiments in this subject. They are accordingly added to the Catalogue as a guide to the purchaser. The Department does not grant aid towards their purchase.

CHEAP SETS.

THE CHEAP STÖCKHARDT'S CHEMICAL SETS.

Arranged according to the Directions of PROFESSOR STÖCKHARDT.

FIRST SET, 16s. Packed in a Case, 17s.

- | | |
|--|---|
| <ul style="list-style-type: none"> 1 Holder for Retorts, Tubes or Flasks 2 Hard Glass Retorts, 4 oz. and 12 oz. capacity 2 Hard Glass Receivers, 4 oz. and 12 oz. capacity 1 Spirit Lamp, with single jet, 2 oz. capacity 2 Hard Glass Flasks for boiling, 4 oz. and 8 oz. capacity 1 Hard Glass Flask with jet for washing precipitates, 12 oz. capacity, or for burning hydrogen as generated, or as Marsh's Arsenic Apparatus 2 Gas Cylinders with ground edges 2 Ground Glass Plates for the Cylinders 3 Bottles to hold gases 1 Hard Glass Tube for preparing oxygen gas 1 Test Tube Stand, with 12 holes 12 Test Tubes, 5 in. \times $\frac{5}{8}$ in. 1 Test Tube Cleaner 2 Analytical Glass Funnels for filters 1 Brass Blowpipe 1 Tripod to support a sandbath or flask for digestion, or retort for distillation 2 Wire Triangles for tripod 2 Iron Dishes for sandbaths, 4 in. and 5$\frac{1}{2}$ in. diameter | <ul style="list-style-type: none"> 3 Porcelain Evaporating Dishes, 2$\frac{1}{2}$ in., 3$\frac{1}{2}$ in., and 4$\frac{1}{2}$ in. diameter 2 Porcelain Crucibles and Covers, $\frac{1}{2}$ oz. and 1 oz. capacity 3 Hessian Crucibles, $\frac{1}{2}$ oz., 1 oz., and 2 oz. capacity 1 Mortar and Pestle 3 Cork Borers for perforating corks 12 Assorted Corks for flasks, tubes, &c. 1 Round File for enlarging holes in corks 1 Piece of Wire Gauze 1 ditto of Platinum Foil 1 ditto of Platinum Wire 1 ditto of Copper and Zinc, united for galvanic depositions 1 Iron Spoon for fusions 2 Glass Stirring Rods 3 Tubes for the reduction of arsenic according to the forms of Berzelius, Clark and Rose 2 Bent Leading Tubes for fitting up flasks, &c., for preparing oxygen, hydrogen, and other gases 8 Bent and other Tubes for leading and washing gases, also as syphons A piece of Wood Charcoal for blowpipe |
|--|---|

SECOND SET, 25s. Packed in a Case 26s. 6d.

Includes the First Set, with the extra Apparatus undermentioned.

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 Stoppered Hard Glass Retort, 4-oz. capacity 1 Hard Glass Flask 16-oz. capacity 1 Pipette or Dropping Tube 1 Woulffe's Bottle with 3 necks for washing gases, &c. 1 Spoon with Cap, for charcoal, sulphur, &c., when deflagrated in oxygen 3 Bohemian Beaker Glasses for hot solutions, 4 oz., 6 oz., and 10 oz. capacity 1 Metal Spirit Lamp, with double current and arms to support sand bath, dishes, crucibles, with hot plate and 2 rings | <p><i>Where gas is obtainable a Bunsen's Gas Lamp with Arms and Rings may be substituted for the Spirit Lamp above mentioned.</i></p> <ul style="list-style-type: none"> 1 Thistle-headed Glass Safety Funnel to introduce acid in the preparation of gases 1 Chloride of Calcium Tube for drying gases 1 Berzelius' Blowpipe, with moveable Platinum jet, to prevent oxidation and Horn Mouth-piece (<i>instead of Brass Blowpipe as contained in former set</i>) 1 pair of Crucible Tongs Book containing upward of 400 Re-agent Labels, gummed, with symbols |
|--|--|

THIRD SET, 50s. Packed in a Case, 52s.*Includes the Second Set, with the following additions.*

- | | |
|---|---|
| 1 Box of Scales and Weights with glass pans | 2 Hydrometers for ascertaining the density of fluids, taking 1,000 grains of distilled water at 60° Fahr. as standard, one for fluids lighter than water, as Spirits, &c., 700° to 1,000°, one for heavier fluids, 1,000° to 1,850° |
| 1 Graduated 2 oz. Glass Measure | |
| 1 Gas Receiver, 20 oz. capacity, with brass cap, stopcock, bladder ferrule and jet, for holding or conveying gases into bladders, balloons, &c. | 1 Solution Tube for holding the fluids for Hydrometer during immersion |
| 1 Pneumatic Trough, 1 gall. | 1 Graduated Test Measure 1,000 grains in 100 divisions |
| 1 Thermometer, graduated on stem to 400° Fahr., to pass through corks into flasks, &c., in Case | |

SET OF STÖCKHARDT'S RE-AGENTS, 21s.

A Test Cabinet containing the following Re-agents in closely Stopped Bottles from which Testing Solutions may be made.

- | | |
|----------------------------------|------------------------------------|
| Potassium Antimoniate | Barium Chloride |
| Peroxide of Mercury | Calcium Hydrate |
| Solution of Chloride of gold | Calcium Sulphate |
| Solution of Chloride of Platinum | Sodium Phosphate |
| Solution of Nitrate of Silver | Sodium Carbonate |
| Solution of Nitrate of Cobalt | Sodium and Ammonium Phosphate |
| Indigo Sulphate | Potassium Hydrate |
| Ammonia Solution | Potassium Chromate |
| Potassium Ferrocyanide | Tincture of Nutgalls |
| Tin Protochloride | Granulated Zinc |
| Lead Acetate | Ammonium Chloride |
| Iron Sulphate | Oxalic Acid |
| Iron Sulphide | Tartaric Acid |
| Ammonium Sulphide | Hydrochloric Acid |
| Ammonium Oxalate | Sulphuric Acid |
| Dried Borax | Nitric Acid |
| Ammonium Carbonate | Test Papers for Alkalies and Acids |

A POLISHED TEAK CASE, with Hinges, Lock, and Key, Divisions for Bottles, &c. substantially made for any climate, containing the Third Set and Re-agents. Price £5 ; an Outer Packing Case, 3/6 extra.

THE CHEAP ANALYTICAL SET FOR BEGINNERS, 7s. 6d.

Packed in a Case, 8s.

- | | |
|------------------------|---|
| Spirit Lamp | Charcoal for Blowpipe |
| Test Tube Stand | Test Tube Cleaner |
| Retort Stand with ring | Porcelain Evaporating Basin |
| Sandbath Dish | Porcelain Capsule |
| 6 Test Tubes | 2 Glass Funnels |
| Test Tube Holder | 100 Cut Filters |
| Hard Glass Flask | 2 Watch Glasses |
| Bohemian Beaker Glass | Glass Tubes and Rods |
| Black's Blowpipe | Mortar and Pestle |
| Platinum Wire and Foil | Sulphuretted Hydrogen Flask and Acid Funnel |

For this Set Bloxam's Laboratory Teaching is most suitable.

THE CHEAP ANALYTICAL SET, FOR TEACHERS. Packed, 40s.

As supplied under the authority of the Privy Council Board of Education,
Science Form, No. 402.

Conical Brass Blowpipe with bone mouthpiece
6 inches Platinum Wire
Platinum Foil, 2 inches long and 1 inch wide
Test Tube Stand, 24 holes
18 Test Tubes 6 in. \times $\frac{3}{4}$ in., and 12 5 in. \times $\frac{1}{2}$ in.
2 Boiling Tubes, 8 in. \times $1\frac{1}{4}$ in.
2 Test Tube Brushes
Set of 3 Beakers
German Flasks, 1 each—2, 4, 8, 16, 30 oz. capacity
Berlin Porcelain Crucible, $1\frac{1}{2}$ in. diameter
Berlin Porcelain Evaporating Basins, 1 each
2 $\frac{3}{4}$ in. and 3 $\frac{1}{2}$ in. diameter
English Filter Paper, 2 packets of 100 each 2 $\frac{3}{4}$ in.
and 4 $\frac{1}{2}$ in. diameter
Funnels, one each 1 $\frac{1}{2}$, 2, and 3 in. diameter
Iron Retort Stand, with 2 rings, clamp and
square block
Iron Wire Gauze, 5 in. square, 2 pieces
Tinplate Sandbath, 5 in. diameter
6 Watch Glasses, 2 in. diameter
 $\frac{1}{2}$ lb. each, soft Glass Tube $\frac{1}{4}$ in. diameter, and
Combustion Tube $\frac{3}{8}$ in. diameter
 $\frac{1}{4}$ lb. Glass Rod $\frac{3}{16}$ in. diameter
2 ft. each, Black Caoutchouc Tube, $\frac{1}{8}$ in. and
 $\frac{3}{8}$ in. bore

Thistle Funnel, 18 in. long
3 dozen assorted Corks
Woulffe's Bottle, 2 necks, pint capacity
Stoppered German Glass Retort, 2 oz.
Set of 3 Corkborers, $\frac{3}{16}$ in., $\frac{1}{4}$ in., and $\frac{5}{8}$ in., with
Iron Rod
Triangular File, and 5 in. Round File, and
Handles
Bunsen's Gas Burner, with blowpipe jet, star
support, chimney, and rose burner
Iron Crucible Tongs
4 in. Porcelain Mortar and Pestle
Box of Test Papers, blue and red litmus
Solution of Cobaltous Nitrate, $\frac{1}{2}$ oz. Stoppered
Bottle
" Argentic " " "
" Platinic Chloride " "
1 pint Methylated Alcohol, in Bottle
Glass Spirit Lamp, 4 oz. capacity

*Deal Box to contain the set included.
For this set "Valentin's Chemistry" is most
suitable.*

Additional Apparatus for Quantitative Analysis, £2 2s.

THE CHEAP LECTURE SET FOR EXPERIMENTS WITH THE GASES, 42s.

Hard Glass Flask, with safety funnel and
leading tube, arranged for the preparation
of hydrogen, carbonic acid, chlorine gases, &c.
Hard Glass Flask, with leading tube, for the
preparation of oxygen, laughing gas, &c.
1 Flask Holder, for the Hand
Sheet Iron Retort, for oxygen
Japanned Tin Pneumatic Trough, with side
shelves
Metal Spirit Lamp with double current, and
ring to support flasks; or where gas is
obtainable a Bunsen's Gas Lamp instead of
the Spirit Lamp
1 Iron Tripod, with sandbath dish
1 Gas Receiver, capacity one pint, fitted with
brass cap, stopcock, bladder and ferrule,
and brass jet for burning hydrogen
3 Gas Receivers, One quart capacity, one plain
and two stoppered

2 Earthenware Trays, for removing gas receivers
from pneumatic trough when filled
3 Ground Glass Plate Covers, for gas receivers
Deflagrating Jar, one pint capacity, with ground
edge, brass cap and spoon, for phosphorus,
sulphur, &c.
1 Taper Holder
1 Extra Deflagrating Jar
Woulffe's Bottle, with tubes arranged for
purifying gases
Strong Glass Tube, for exploding the mixture of
hydrogen and oxygen
Iron Wire Gauze, for Davy's experiment
2 Goldbeater's Skin Balloons, for hydrogen
Mouthpiece, for inhaling laughing gas from a
bladder or gas bag
3 ft. Caoutchouc Tube

Packing Case for the Set, 2s.

*When it is desirable to make larger quantities of Gases than the above receivers will hold, 1 or more
4-gallon Gas Holders of Japanned Tin, with Stopcock, at 28s. each, or Vulcanized Rubber Gas Bags,
19 in. by 17 ins., at 12s. 6d., may be added to the Set.*

CHEAP SETS OF APPARATUS FOR 500 CHEMICAL EXPERIMENTS.

FIRST SET, PACKED IN BOX, 5s.

Test Tube Stand
6 Test Tubes
Test Tube Cleaner
Test Tube Holder
Bohemian Glass Flask
Glass Tube for bending
Stirring Rod
Glass Funnel

Spirit Lamp
Wire Tripod
Sand Dish
Porcelain Evaporating Basin
Mortar and Pestle
Brass Blowpipe
Charcoal

SECOND SET, PACKED IN BOX, 10s.

Test Tube Stand
6 Test Tubes
1 Large Test Tube
Test Tube Cleaner
Test Tube Holder
2 Bohemian Glass Flasks
Glass Tube for bending
Stirring Rod
Glass Funnel
100 Cut Filters
Retort Stand, with two rings
Retort
Bohemian Glass Beaker

Spirit Lamp
Wire Tripod
Sand Dish
Porcelain Evaporating Basin
Mortar and Pestle
Brass Blowpipe
Charcoal
Platinum Wire and Foil
Gas Cylinder, with ground edge, 6 in.
Ground Glass Plate
Woulffe's Bottle
Thistle-Head Funnel
Pipette

THIRD SET, PACKED IN BOX, 15s.

Test Tube Stand
1 doz. Test Tubes
1 Large Test Tube
Test Tube Cleaner
Test Tube Holder
2 Bohemian Glass Flasks
Glass Tube for bending
2 Glass Stirring Rods
2 Glass Funnels
Wire Triangle
3 Bohemian Beakers
100 Cut Filters, $3\frac{3}{4}$ in.
Retort Stand, with two rings
Tubulated Retort
Plain Receiver
Pneumatic Trough Shelf

Spirit Lamp, 2 oz.
Wire Tripod
Sand Dish
2 Porcelain Evaporating Basins
Mortar and Pestle
Brass Blowpipe
Charcoal
Platinum Wire and Foil
Gas Cylinder, with ground edge, 8 in.
Ground Glass Plate
Woulffe's Bottle
Thistle-Head Funnel
Pipette
2 Watch Glasses
Chloride Calcium Tube
Deflagrating Spoon and Cap

FOURTH SET, PACKED IN CASE, £1.

Test Tube Stand	Spirit Lamp, 2 oz.
1 doz. Test Tubes	Iron Tripod
2 Large Test Tubes	Sand Dish
Test Tube Cleaner	3 Porcelain Evaporating Basins
Test Tube Holder	Mortar and Pestle
3 Bohemian Glass Flasks	Brass Blowpipe
Glass Tube for bending	Charcoal
2 Glass Stirring Rods	Platinum Wire and Foil
2 Glass Funnels	2 Gas Cylinders, with ground edge. 8 in.
Pipeclay Triangle	2 Ground Glass Plates
3 Bohemian Beakers	Woulffe's Bottle
100 Cut Filters	Thistle-Head Funnel
Retort Stand, two rings	Pipette
Tubulated Retort	2 Watch Glasses
Plain Receiver	Chloride Calcium Tube
Japanned Tin Pneumatic Trough	India-rubber Tube
Set 3 Brass Cork Borers	Deflagrating Spoon and Cap
Porcelain Crucible and Cover	Assorted Corks

SETS OF APPARATUS.

Arranged by Mr. WANKLYN, for the use of Medical Officers of Health, in the
Analysis of Water, Milk, Tea, Coffee, and Cocoa.

WATER SET.

Chemical Balance, in glass case	2 Graduated Pipettes
Set of Chemical Weights, 50 grammes to 1 centigramme	Porcelain Evaporating Basin
Liebig's Condenser, japanned copper body, with joint and telescope slide, on tripod stand	3 Flasks, marked in the neck
3 extra Condenser Tubes	Galvanized Iron Retort Stand, with 3 rings
6 Stopped Retorts, 1 litre capacity	Bell-metal Clamp
1 doz. Nessler Tubes, marked at 50 c.c.	Bunsen's Burner, with regulator
Mohr's Burette, with stopcock	4 feet Vulcanised Rubber Tube
Mahogany Burette Stand, with clamp	Platinum Dish, 3 in. diameter
	Chromate of Potash, in stoppered bottle

Complete Set, £10 10s. Packing Case, 5s. extra.

RE-AGENTS FOR WANKLYN'S WATER ANALYSIS.

Prepared specially, and of guaranteed accuracy,

Quick Nessler Test	15s. per litre.
Standard Ammonia	5s. "
Permanganate Potash	12s. "
Standard Nitrate Silver	8s. "
„ Soap Test	8s. "

MILK ANALYSIS SET.

Chemical Balance, in glass case	4 feet Vulcanized Rubber Tube
Set of Chemical Weights, 50 grammes to 1 centigramme	Platinum Dish
Copper Water Bath, with 6 holes and covers	Methylated Ether
Iron Stand for ditto	Alcohol
6 Platinum Capsules, numbered	Nest Bohemian Beakers
Marked Pipette	Wood Funnel Holder
Flask, marked in the neck	Glass Funnel
Bunsen's Burner, with regulator	Packet Cut Filters

Complete Set, £10 7/- Packing Case, 3/ extra.

TEA, COFFEE, AND COCOA ANALYSIS SET.

Chemical Balance, in glass case	Porcelain Evaporating Basin
Set of Chemical Weights, 50 grammes to 1 centigramme	Flask, with bent Tube fitted
Platinum Crucible and Cover	2 Flasks, marked in neck
Platinum Dish	Pipette, marked
Platinum Wire for Stirrer	Thermometer, graduated on stem
Bunsen's Burner, with regulator	Mortar and Pestle
4 feet Vulcanized Rubber Tube	White Porcelain Tile, for colour testing
Retort Stand, with rings and bell-metal clamp	3 Pipe Clay Triangles
Glass Liebig's Condenser	Wood Filter Stand
Bohemian Glass Beaker	2 Glass Funnels
	Packet Cut Filters

Complete Set, £9 17/. Packing Cases, 3/ extra.

Where great accuracy is required, Chemical Balances are supplied varying in prices from £6 6/ to £18 18/, each in glass case. Chemical Weights in Mahogany Box, 35/ per set (see TOWNSON & MERCER'S Illustrated Catalogue, "Balances and Weights").

**THE ROYAL VETERINARY COLLEGE SET OF
CHEMICAL APPARATUS.**

Arranged by PROFESSOR TUSON.

$\frac{1}{2}$ lb. Glass Tube	3 Berlin Porcelain Evaporating Basins
Round File and Handle	1 Berlin Porcelain Crucible
Triangular ditto	Wire Triangle
1 doz. Test Tubes	3 Glass Stirring Rods
2 Boiling Flasks	1 Stoppered Retort
Test Tube Stand, with Pegs	6 Watch Glasses
Thistle-Head Funnel	Box Test Papers
1 ft. Vulcanized Rubber Tube	Black's Blowpipe
Retort Stand, 17 in. Rod, with two rings	Test Tube Brush
Sand Dish	Platinum Wire and Foil
2 Bohemian Beakers	Pair Crucible Tongs
2 Phillips' Precipitating Beakers	Mortar and Pestle
Packet of Cut Filters	Set of 3 Cork Borers
3 Glass Funnels	2 doz. assorted Corks

Packed in Case, 21/.

SET OF APPARATUS AND RE-AGENTS,*For the Analysis of Malts, Saccharine Materials, Beers, &c.*

Arranged by PROF. GRAHAM, D.Sc., (Lond.), &c., University College, London, W.C.

Chemical Balance	1 lb. Glass Tubing assorted
Pair Glass Scale Pans for do.	Metal Clamp for Retort Stand
Set Chemical Weights	2 Bunsen's Burners with 1 Rose Top
Taylor's Drying Oven, Japanned Tin	1 Packet Swedish Filter Paper
Retort Stand, Galvanized Iron	1 Do. English do.
2 Tripod Stands	12 Sheets Rhenish do.
Geissler's Burette with Stopcock, 50 cc. in 10ths.	1 Book of Tables of Original Gravities of Beer
Glass Liebig's Condenser	Pair Brass Crucible Tongs
5 Pipettes marked to deliver specific quantities	Porcelain Testing Tile
1 Pipette Graduated, 10 cc.	Specific Gravity Bottle and Counterpoise
3 Berlin Porcelain Evaporating Basins	Thermometer Graduated on Stem
2 Doz. Test Tubes assorted	3 Sand Dishes
Test Tube Stand with Pegs	3 feet Black Vulcanised Rubber Tube assorted
7 N.M. Stopped Bottles 8 oz.	12 feet Vulcanised Gas Tubing
6 Do. do. 16 oz.	4 doz. Assorted Best Corks
6 Each W.M. do. 8 oz. and 16 oz.	Set of 8 Bohemian Beakers
6 Do. do. 1 oz.	6 Glass Stirring Rods
5 Do. do. 2 oz.	2 Squares Fine Wire Gauze
2 Tin Water Baths	1 Each Round and Triangular Files with Handles
5 Bohemian Flasks assorted	Test Tube Cleaner
4 Bohemian Funnels assorted	1 Berlin Porcelain Crucible
4 Stopped and Marked Flasks	4 Nessler Tubes assorted
4 Light Glass Evaporating Basins	3 N.M. Corbyn Qts. stoppered
1 Pipeclay Triangle	1 Packet Plain Labels
1 Burette Stand	Mortar and Pestle 5in.
1 India Rubber Cork 2 holes	

CHEMICALS.

Acetic Acid	Potassium Iodide
Ammonia Solution	Do. Permanganate
Animal Charcoal	Ammonium Chloride
Sulphuric Acid	Potash Caustic
Dried Carbonate of Soda, Pure	Oxalic Acid
Caustic Soda	Alcohol Absolute
Infusion of Litmus	Potash Chromate
6 Books Test Papers assorted	Ammonium Oxalate
Iodine	Do. Carbonate
Iron Sulphate	Sodium Phosphate
Copper Sulphate, Pure	Barium Chloride
Rochelle Salt	Hydrochloric Acid
Mercury Chloride	

Set Complete £10 10s. 0d.With Balance in Glass Case, £1. 5s. extra. *Packing Case, 5/- extra.***The CHEAP SET of BLOW PIPE APPARATUS, 21s.***(See page 36.)***OXFORD LOCAL EXAMINATION.**

Candidates for Examination must provide themselves with the following Apparatus for the Examination.

3 Glass Funnels, 2½ in.	2 Pieces Platinum Foil, 2 × 1 in.
Packet Cut Filters 3½ in.	2 Platinum Wires, 3 in.
1 doz. each Test Tubes, 6 × 5/8 in. and 6 × 7/8 in.	3 Pieces Blowpipe Charcoal
Test Tube Stand, 24 holes	3 Tubes, closed, 4 × 1/4 in.
1 Glass Stirring Rod, 8 in.	Bent Tube fitted with Cork
Retort Stand	Pair Crucible Tongs
Spirit Lamp, 3 oz., and Wick	Spatula
¼-pint Methylated Spirit, in bottle	Test Tube Brush
Washing Bottle, ½-pint	Cloth
Blowpipe, Japanned Tin	

Price of the Set in Smooth Deal Case, 14s. 6d.

RE-AGENTS, SOLUTIONS IN WELL STOPPERED BOTTLES, 2 oz.

Hydrate of Potassium
 Ferrocyanide of Potassium
 Carbonate of Sodium
 Phosphate of Sodium
 Ammonia
 Bitartrate of Sodium
 Carbonate of Ammonium
 Chloride of Ammonium
 Oxalate of Ammonium
 Sulphide of Ammonium
 Lime Water

Sulphate of Calcium
 Nitrate of Barium
 Sulphate of Magnesium
 Nitrate of Silver
 Sulphuretted Hydrogen
 Sulphuric Acid
 Nitric Acid
 Hydrochloric Acid
 Acetic Acid
 Chlorine Water
 Nitrate of Cobalt

Price of Set in Smooth Deal Case, 20s., or with the following:—

SOLID SUBSTANCES IN STOPPERED WIDE MOUTH BOTTLES, 2 oz.

Carbonate of Sodium. Borax. Sulphate of Iron.
 Peroxide of Manganese. Bichromate of Potassium. White Starch.
 Litmus and Turmeric Papers.

Price in Smooth Deal Case, 25s.

CAMBRIDGE LOCAL EXAMINATION SET.

6 Glass Funnels, 2 in.
 25 Cut Filters for ditto
 2 doz. Test Tubes, $6 \times \frac{5}{8}$ in.
 Test Tube Stand, 24 holes
 2 Glass Stirring Rods, 9 in.
 3 Porcelain Evaporating Basins
 Gmelin's Washing Bottle
 3 Tubes, closed, $4 \times \frac{1}{2}$ in.
 Spirit Lamp, 3 oz., and Wick

$\frac{1}{2}$ -pint Methylated Spirit, in bottle
 Lamp Cylinder
 Triangle for ditto
 Blowpipe
 Platinum Foil, 2×1 in.
 Platinum Wire, 3 in.
 3 pieces Blowpipe Charcoal
 Penknife or Spatula

Price of the Set in Smooth Deal Case, 12s. 6d.

SCIENCE TEACHERS' SET.

Science Teachers attending the Course of Instruction in Practical Hygiene, at the Normal School of Science, South Kensington, will be required to provide themselves with the following articles:—

12 Test Tubes, 8 in. $\times \frac{3}{4}$ in.
 2 Test Tube Brushes
 1 each Berlin Porcelain Basin, 4 in. and 6 in.
 1 each Glass Stirring Rod, 8 in. and 10 in.
 1 each German Flask, 16, 20, 40 oz.
 1 Gas Generating Flask, fitted, 16 oz.
 2 India-rubber Corks to fit 20 & 40 oz. Flasks
 2 Watch Glasses
 2 Glass Basins, $3\frac{1}{2}$ in. diameter
 2 Funnels, 3 in. diameter
 4 ft. Glass Tube, $\frac{3}{16}$ to $\frac{1}{4}$ in. diameter
 Nest of Beakers, 10 to 20 oz.
 Iron Tripod Stand, 8 in. high, 5 in. Triangle

1 ft. Wire Gauze, fine Mesh
 3 Pipeclay Wire Triangles
 3 ft. Black Caoutchouc Tube, $\frac{3}{8}$ in.
 1 Triangular File
 1 Pair Brass Crucible Tongs, 6 in.
 Mortar and Pestle, 4 in.
 Assorted Test Papers
 W. M. Bottle, with cork, 10 to 15 oz.
 Ditto ditto 20 oz.
 Packet Cut Filter Paper, 4 in.
 Bunsen's Gas Burner
 Glass Cloth
 Duster

CHEMICALS IN STOPPERED BOTTLES.

$\frac{1}{2}$ oz. Nitrate Silver	$\frac{1}{2}$ oz. Oxalate Ammonia
$\frac{1}{2}$ oz. Solution Chloride Gold	$\frac{1}{2}$ oz. Permanganate Potash
$\frac{1}{2}$ oz. Iodide Potassium	3 oz. Sulphide Ammonium
$\frac{1}{2}$ oz. Bichloride Mercury	4 oz. Zinc, pure

Price in Case complete, £1 10s.

FOR MICROSCOPIC WORK.

1 Knife or Scalpel	$\frac{1}{4}$ oz. Thin Covering Glasses
1 Pair Forceps	Camel's Hair Brush
$\frac{1}{2}$ doz. Thin Glass Slips	2 Mounted Needles

Price, 5s. 6d.

SETS OF APPARATUS AND CHEMICALS

Used at the Birkbeck Laboratory, University College, London.

For Beginners, Price 14s.

Bunsen Burner	2 German Basins, 3 in.
2 ft. Grey I. R. Tube $\frac{1}{2}$ in.	1 " " 5 $\frac{1}{2}$ in.
Retort Stand	$\frac{1}{2}$ in. Glass Tube
Test Tube Stand	Triangular File
2 doz. Test Tubes	2 German Funnels, 2 in.
German Flask	1 " " 3 in.
Florence Flask	I. R. Cork, 2 holes for Flask
2 Bohemian Flasks	pkt. English Filter Paper
4 Beakers	Square Fine Wire Gauze

SET OF CHEMICALS &c., FOR QUANTITATIVE ANALYSIS.

Price £3 3s.

1 Thermometer, enamelled, 300° Cent.	2 oz. Ammonium Chloride
1 each Stoppered Flasks, graduated to deliver 250, 500, and 1000 c.c.	1 " Copper Sulphate
1 each Pipettes, graduated to deliver 25, 50, and 100 c.c.	1 " Iceland Spar
1 Pipette, 10 c.c. graduated in $\frac{1}{10}$	2 " Iodine resublimed
1 Pair Watch Glasses and Clip	1 " Pure Iron
1 Small Stoppered Weighing Bottle	$\frac{1}{2}$ " Mercury Chloride
1 Tile, 6 in., glazed, both sides	$\frac{1}{2}$ " Lead Nitrate
1 Packet Swedish Filter Paper, 4 $\frac{1}{2}$ in.	1 " Potassium Chromate
2 Berlin Crucibles and Covers	2 " " Iodide
1 Geissler Burette, 100 c.c. in $\frac{1}{5}$	1 " " Nitrate
1 Stand for ditto	1 " " Permanganate
6 Beakers, 20 oz., and Covers	1 " " Sulphate
1 Glass Desiccator	2 " Sodium Carbonate
3 oz. Acid Arsenious	2 " " Chloride
2 " " Oxalic	4 " " Hyposulphite
$\frac{1}{2}$ " " Potash Alum	1 " Tin, granulated
	1 " Uranium Nitrate
	$\frac{1}{2}$ " Zinc Sulphate

All Chemicals for the Set in corked wood top bottles, and stoppered bottles where necessary.

TOWNSON AND MERCER'S USEFUL SET OF APPARATUS AND CHEMICALS.

Suitable for a Present or School Prize. Price £2 2s.

Mortar and Pestle	Black's Blowpipe
2 Gas Cylinders	Charcoal
2 Glass Plates	Platinum Wire and Foil
Woulfe's Bottle	Chloride Calcium Tube
Thistle Funnel	Deflagrating Spoon and Cap
Pipette	Assorted Corks
India Rubber Tube	1 dozen Test Tubes
Pneumatic Trough Shelf	2 Boiling Tubes
2 Funnels	Test Tube Stand
Packet Cut Filters	" Holder
Berlin Crucible and Cover	Box Scales and Weights
Retort Stand, 3 rings	3 Boiling Flasks
$\frac{1}{2}$ lb. Glass Tube	Pipe Clay Triangle
2 Stirring Rods	Set 3 Beakers
Stoppered Retort	Set 3 Cork Borers
Receiver	Spirit Lamp
Sand Dish	Iron Tripod Stand
3 Porcelain Basins	Book 500 Chemical Experiments

CHEMICALS IN STOPPERED BOTTLES.

Hydrochloric Acid	Barium Chloride
Nitric Acid	Ammonium Chloride
Sulphuric Acid	Iron Sulphide
Ammonia	Borax
Potass Ferrocyanide	Lead Acetate
Potass Chlorate	Ammonium Oxalate
Sol. Nitrate Cobalt	Sodium Phosphate
Sol. Nitrate Silver	Blue and Red Litmus Books

In Black Stained Wood Box, with Divisions for Bottles, &c., Hinges, Lock and Key, and Handles.
Size 20 × 14 × 10 $\frac{1}{2}$ in.

APPARATUS AND CHEMICALS.

Arranged by PROFESSOR WANKLYN, for "Gas Engineers' Chemical Manual."

Becker's Balance	4 feet India Rubber Tubing for ditto
Set Becker's Weights	Trumpet Tube
2 Stoppered Gas Bottles	1 Vertical Glass Cylinders
Bent Tube for ditto	100 Glass Marbles
Mohr's Burette with Stopcock	Glass Beaker
Burette Stand	Bent Condenser Tube
2 Graduated Measures	Wood Table Support
Twaddell's Hydrometer	1 foot India Rubber Tubing for connections
Platinum Crucible	Castor Oil in bottle
Tripod Stand	Barium Hydrate in bottle
Pipeclay Triangle	Lead Acetate, pure, in bottle
Bunsen Burner	Litmus, in bottle
4 feet India Rubber Tubing for ditto	Soda Caustic, stick, in bottle
pair Iron Crucible Tongs	Sulphuric Acid, pure, in bottle
6 Flasks, with side tube	Iodine, in bottle
White Metal Burner	Copper subchloride, in bottle

Price Complete in Case, £13.

THE PHARMACEUTICAL SET.

As arranged by PROF. ATFIELD for the Students at the Laboratory of the Pharmaceutical Society, Bloomsbury Square.

Packed in Smooth Deal Case, 25s.

THE CITY OF LONDON SCHOOL SET OF APPARATUS AND CHEMICALS.

Arranged by MR. H. DURHAM, for the Pupils at the City of London School.

Packed in Smooth Deal Case, 12s.

THE ROYAL COLLEGE OF CHEMISTRY SET OF APPARATUS, £3.

In consequence of the reduction in the prices of the various articles comprised in this set, TOWNSON & MERCER are now prepared to supply the same at £2 10/, delivered free at the Laboratory, provided that the order is sent *direct* to the firm, and accompanied by a remittance for the amount.

TOBACCO DUTY.

APPARATUS required by Tobacco Manufacturers for ascertaining the amount of moisture in Tobacco, as recommended by the authorities of the INLAND REVENUE LABORATORY, Somerset House, London.

Becker's Balance, No. 29, in French Polished Mahogany Glass Case, with counterpoised sliding front, brass Pans, and provided with set screws and level for a charge up to 750 grains and sensible to $\frac{1}{50}$ th grain, or 50 grammes and sensible to $\frac{1}{2}$ milligramme.

Set of Weights in Polished Mahogany Box, 1000 grains to $\frac{1}{1000}$ th grain, or 50 grammes and intermediate weights to 1 milligramme.

Copper Water Drying Oven, with sliding shelf to take 6 Tin Pans, on Iron Stand.

Thermometer, Graduated on stem.

Six Tin Pans with Covers numbered 1 to 6

Bunsen's Burner, $\frac{9}{16}$ in. best with Rose Top.

5 feet Red Vulcanized Rubber Tube.

Complete, including Packing Case, £6 6s.

Or With Patented Hot Water Oven 11/6 Extra.

DIRECTIONS to be observed in using the Apparatus for ascertaining the amount of moisture in Tobacco.

1.—Adjust the Balance with the set screws at the bottom of the Mahogany Case so that the bubble in the Spirit Level shall be in the centre; in fixing the parts of the Balance in their relative positions, take notice that the marks . : on the beam and pan supports correspond, which must be particularly attended to; the Balance must be kept in a dry place on a firm table, and free from the vibration caused by machinery in motion.

2.—Take the 6 Tin Capsules numbered 1 to 6, weigh accurately, and scratch on each one the weight with and without the cover.

3.—The Copper Drying Oven is to be placed on the stand, having been first about half filled with water at the screw orifice placed for that purpose on the top of the Oven, make the water boil by means of the Rose Gas Burner supplied.

4.—Take 100 grains of the manufactured Tobacco selected from at least six various parts of the bulk, and put into one of the Capsules without the cover, place this in any part of the Hot Water Oven and allow to remain for about 6 hours, remove from the Oven, replace the cover, allow to become cool, then weigh and take down weight; remove the cover and re-place in Oven, and allow to remain in Oven for 2 hours longer, replace the cover, and after cooling weigh; should there be any variation in the weight, it must be returned to the Oven and the operation repeated until the weight is constant.

The loss on the 100 grains represents the percentage of moisture. Thus—

Capsule and Cover, weight	.. .. .	500 grains
Tobacco	.. .. .	100 „
		<hr/>
Weight after drying	.. .. .	600 grains
		570 „
		<hr/>
	Loss	30 grains

Which represents 30% moisture.

Copy of Instructions issued by the Inland Revenue Authorities for the guidance of Tobacco Manufacturers.

To manufacture Tobacco which when finished for sale is, according to the proposed new Regulation, not to contain more than 35 per cent. moisture.

To each 100 lb. of leaf containing—

12 per cent. original moisture may be added	.. .. .	35 lb. 6 oz. of water.
13	.. .. .	33 „ 14 „ „
14	.. .. .	32 „ 5 „ „
15	.. .. .	30 „ 12 „ „
15	.. .. .	29 „ 4 „ „
17	.. .. .	27 „ 11 „ „

In the above table no allowance is made for loss by Stoving, &c.

THE CHEAP SET OF AIR PUMP APPARATUS. No. 1, £5 5s.

This Set is intended to illustrate the properties of the atmosphere—its pressure, elasticity, resistance to falling bodies, and comprises an Air-pump, with Plate 5 $\frac{3}{4}$ in. diameter, a Clamp to fix the pump on a table, 3 Glass Receivers (one closed and two open), the Barometer or Torricellian Experiment, Magdeburg Hemispheres, Filtering Cup or Mercury Shower, Fountain in Vacuo, Bladder or Hand Glass, Capillary Tube, Balloon, Bladder and Lead Weight, Cartesian Figure in Tube, Water Hammer, Bell Experiment, Guinea and Feather Experiment.

Packing Case, 2s. 6d. extra.

No. 2.

The same Apparatus as above, with Tate's Air-pump in exchange, £7.

Packing Case, 3s. 6d. extra.

CHEAP SETS OF ELECTRICAL APPARATUS.

First Set, £2 5s., with a Cylinder Machine.

Consists of an Electrical Machine, with cylinder about 10 in. by 6 in., on French Polished Mahogany Stand, with Brass Conductor; also a pint Leyden Jar, Discharger, Pith Ball Electrometer, Head of Hair, Pith Ball Stand, Whirl or Fly, Hand Spiral. Chain and Box of Amalgam.

Packing Case, 2s. 6d. extra.

Second Set, £3 10s., with a Cylinder Machine.

Consists of a Machine of similar construction to the above, but with cylinder about 11 in. by 7 in. and a pint Leyden Jar, Jointed Discharger, Quadrant Electrometer, Pith Ball Stand, 2 Pith Figures and Insulated Plate, Head of Hair, Orrery, Whirl, Hand Spiral, Set of 3 Bells, Chain and Box of Amalgam.

Packing Case, 3s. extra.

Third Set, £6 10s., with a Plate Machine.

Consists of a Machine with a Plate 15 in. diameter, and a Quart and Pint Leyden Jar, Diamond Jar, Jar with moveable coating, Insulating Stool, Jointed Discharger, Quadrant Electrometer, Pith Ball Stand, 2 Pith Figures and Insulated Plate, Head of Hair, Orrery, Whirl, Hand Spiral, Set of 3 Bells, Chain and Box of Amalgam.

Packing Case, 3s. 6d. extra.

THE CHEAP SET OF GALVANIC APPARATUS.

£5 15s.

Consists of a Battery of Four Cells of Grove's, or Eight Cells of Bunsen's, giving sufficient power to decompose water into its constituent gases, heat platinum wire to redness, deflagrate iron wire, show the electric light, decompose neutral salts, ignite alcohol, gunpowder, phosphorus, &c., and enable an electro magnet to sustain nearly 100 lbs. weight. The set also includes the following apparatus for the above experiments, viz.:—Decomposing Water Apparatus with 2 Tubes in Pneumatic Trough, Tube sufficiently strong to bear the explosion of the mixed Gases, Iron Wire, Platinum Wire, Electro Magnet, Carbon Holder on Stand, with Rackwork and Reflector for the Electric Light, Neutral Salts Solution Tube with Electrodes, Ruhmkorff's Induction Coil with Commutator to give $\frac{1}{2}$ in. Spark, Galvanometer in Glass Shade, and set of 6 Vacuum Tubes.

Packing Case, 2s. extra.

One Grove's or Bunsen's Battery only is sufficient for the Induction Coil in showing the Vacuum Tubes, &c. The Induction Coil may be exchanged for a Coil Machine of the same price, with Handles for giving Shocks.

Short Courses of Instruction to Science Teachers, 1888.

LIST OF APPARATUS, &c.,**REQUIRED FOR THE COURSE IN AGRICULTURE AND AGRICULTURAL CHEMISTRY.**

Teachers attending the short course of instruction in **Agriculture and Agricultural Chemistry** at the Normal School of Science, South Kensington, will be required to provide themselves with Apparatus as detailed on this Form.

I.—List of Apparatus required for Qualitative Chemical Analysis.

Conical brass blowpipe with bone mouthpiece	Glass tubes, combustion, $\frac{3}{8}$ in. bore, $\frac{1}{2}$ lb., in lengths of about 2 feet
6 inches platinum wire (or if intended for use in Quantitative Analysis 12 inches will be required)	Thin glass rods, $\frac{3}{16}$ in. diameter, $\frac{1}{4}$ lb., in lengths of about 2 feet
Platinum foil, 2 inches long and 1 inch wide	4 feet black caoutchouc tube, $\frac{3}{8}$ in. bore
Test tube stand, 24 holes	2 feet black caoutchouc tube, $\frac{1}{2}$ in. bore
18 Test tubes, 6 in. by $\frac{3}{4}$ in.	2 Thistle headed funnels
12 Test tubes, 5 in. by $\frac{1}{2}$ in.	3 dozen assorted corks
Basket for holding test tubes	Stoppered German retort, 2 oz.
2 Boiling tubes, 8 in. by $1\frac{1}{2}$ in.	Set of three cork borers, $\frac{3}{16}$, $\frac{1}{4}$, and $\frac{3}{8}$ in., with iron rod
2 Test tube brushes	Triangular file to cut glass tubes, in handle
Set of six beakers	5 inch round file, in handle
German flasks, one of each, 2 oz., 4 oz., 8 oz., and 30 oz.	Pair of scissors
Berlin porcelain crucible, $1\frac{1}{2}$ in.	Bunsen's gas burner, with blowpipe jet, star support, chimney, and rose
Berlin porcelain evaporating basins, one of each, $2\frac{3}{4}$ in. and $3\frac{1}{2}$ in. diameter	Brass or iron crucible tongs
Funnels, three of $2\frac{1}{4}$ in., one of 3 in.	4 inch porcelain mortar
Black wood funnel holder	Steel spatula, 5 in., coco handle
English filter paper, cut, two packets of 100 filters each, $2\frac{3}{4}$ in. and $3\frac{1}{2}$ in. diameter	Box of test papers
Iron retort stand, with two rings, clamp, and square iron block	Solution of Argentic nitrate, $\frac{1}{2}$ oz. stoppered bottle
Iron gauze, 5 in. square, two pieces	Solution of Platinic chloride, $\frac{1}{2}$ oz. stoppered bottle
Tin-plate sand bath, 5 in.	2 Dusters
6 Watch glasses, 2 in.	Deal box to contain the set of apparatus
Soft glass tubes, $\frac{3}{16}$ to $\frac{1}{4}$ in. diameter, $\frac{1}{2}$ lb., in lengths of about 2 feet	

Price, Set Complete, £2.

II.—List of Apparatus required, in addition to Qualitative Set, for Quantitative Analysis.

Platinum crucible and capsule
2 weighing tubes

Packet of Swedish filter paper

GREVILLE'S VOLUMETRIC TEST FOR SULPHURETTED HYDROGEN IN GAS LIQUOR.

APPARATUS AND CHEMICALS REQUIRED.

Standard Copper Solution	per quart	10	6
Liquor Ammonia	per lb.	1	6
100 Septem Burette		4	0
Burette Stand		4	6
Pipette marked to deliver 100 grains		0	6
A 4 oz. White Porcelain Capsule, with glass stirring rod		1	0

This test admits of an accurate estimation of sulphuretted hydrogen in gas liquor being made by a comparatively unskilled person in a few minutes. One hundred grains of the liquor to be examined are placed in the porcelain capsule, diluted with a little water, a few drops of ammonia added, and the standard copper solution run in from the Burette, at the same time that the contents of the capsule are briskly stirred. When all the H_2S has become neutralized, the copper sulphide settles rapidly down, leaving a clear supernatant fluid which is neither blue on the one hand nor brown on the other. For further details, see "King's Treatise on the Manufacture and Distribution of Coal Gas," article, "Gas Liquor."

Sets of Apparatus arranged for Class Teaching at Colleges,
Schools, &c., as desired by the Professors or Teachers.

BOOKS ON CHEMISTRY, PHYSICS, &c.

	£	s.	d.
Bloxam's Chemistry	0	14	6
" Laboratory Teaching	0	4	9
Blyth's Foods, Composition, and Analysis	0	14	6
" Poisons, Effects, and Detection	0	14	6
Buckmaster's Inorganic Chemistry	0	1	9
" Acoustics, Light and Heat	0	1	9
" Magnetism and Electricity	0	1	9
Five Hundred Chemical Experiments for One Shilling	0	1	0
Fownes' Inorganic Chemistry	0	7	6
" Organic Chemistry	0	9	0
Fresenius' Qualitative Analysis	0	11	0
" Quantitative Analysis	0	16	6
Ganot's Physics	0	13	6
Gore's Electro-Deposition	0	1	6
Guthrie's Magnetism	0	2	9
Huxley's Physiography	0	5	3
Makin's Manual of Metallurgy	0	14	0
Shenstone on Glass Blowing	0	1	0
Sutton's Volumetric Analysis	0	13	6
Stöckhardt's Experimental Chemistry	0	4	0
Table for Estimating the Original Gravities of Beer	0	1	6
Tate's School Series—Chemistry, Magnetism, Electricity, and Pneumatics	each	0	0
Tyndall on Sound	0	9	6
Wanklyn's Milk Analysis, including Cream, Butter and Cheese	0	4	6
" Tea, Coffee and Cocoa Analysis	0	4	6
" Water Analysis	0	4	6

Messrs. TOWNSON & MERCER are Agents to the
SCIENCE AND ART DEPARTMENT,

For the Supply of Apparatus to Science Classes, &c., towards the purchase
of which the Department grant aid of 50 per cent.

DIRECTIONS TO TEACHERS AND SECRETARIES.

Write to Department for Form 49.

Fill in the form for the Apparatus required, with prices attached, and forward to TOWNSON & MERCER, 89, Bishopsgate Street, E.C., who will then pass it on to the Department for their approval and amount of aid. On receipt of the same from the Department an Invoice will be forwarded by T. & M., with the amount of aid deducted, which should be returned at once, accompanied by a remittance for the amount, when the goods will be despatched without delay.

On receipt of the goods fill in Form 49a, and return to TOWNSON & MERCER.

TOWNSON & MERCER'S
SELECTION OF
APPARATUS AND CHEMICALS
IN GENERAL USE FOR
ASSAY OF GOLD AND SILVER.

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The Numbers correspond with Townson & Mercer's Catalogue.

|     |                                                                                                                                                                                      |        |    |    |   |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|----|---|
| 44  | Becker's Balance for rough weighing                                                                                                                                                  | ... .. | £2 | 5  | 0 |
| 52  | „ Chemical Balance, No. 10, for a charge up to 100 grammes, and sensible to $\frac{1}{4}$ th part of a milligramme<br>Pans and bows nickel-plated, provided with two rider apparatus | ... .. | 8  | 6  | 8 |
| 95  | Oertling's Assay Balance, No. 11, 8 in. beam, to carry 30 grains and turn to 1/1000th grain, Beam divided, and apparatus fixed for moving sliding weight                             | ... .. | 15 | 0  | 0 |
| 138 | Weights, Set of 1 gramme and its subdivisions in 1,000 parts, in Platinum for Assaying Silver                                                                                        | ... .. | 1  | 10 | 0 |
| 139 | Weights, Set of $\frac{1}{2}$ gramme and its subdivisions in 1,000 parts, in Platinum for Assaying Gold                                                                              | ... .. | 1  | 10 | 0 |
| 140 | Becker's Weights, No. 13, 50 grammes down to 1 milligramme, with nickel-plated forceps and 2 riders                                                                                  | ... .. | 1  | 6  | 8 |
| 150 | Becker's Weights, No. 32, 1,000 grammes down to 1 milligramme, with brass forceps                                                                                                    | ... .. | 1  | 4  | 2 |
| 186 | Basins, 3 each Berlin Porcelain, Nos. 2, 6, 7, 8                                                                                                                                     | ... .. | 1  | 2  | 9 |
| 198 | Basins, 6 Enamelled Iron, Evaporating, with lip, 8 in.                                                                                                                               | ... .. | 0  | 6  | 0 |
| 207 | Beakers, 3 Nests, Best Bohemian Glass, 1—8                                                                                                                                           | ... .. | 0  | 12 | 9 |
| 233 | Blowpipe, Black's brass, with ivory mouthpiece                                                                                                                                       | ... .. | 0  | 2  | 0 |
| 264 | Charcoal Blocks, 12 Compressed, 6 × 1 in.                                                                                                                                            | ... .. | 0  | 6  | 0 |
| 307 | Bottles, 1 Doz. Best Stout German Glass, free from lead, accurately stoppered. Stopper and Bottle numbered, narrow mouth for Test Solutions, 12 oz.                                  | ... .. | 0  | 11 | 6 |
| 308 | Bottles, 1 doz. Best Stout German Glass, wide mouth, for dry Chemicals, 12 oz.                                                                                                       | ... .. | 0  | 13 | 6 |
| 309 | Bottles, 4 Best Stout German Glass, cut octagon stoppers, with etched Labels, for Acids, 12 oz.                                                                                      | ... .. | 0  | 11 | 0 |
|     | Corks, finest quality, picked for Chemical purposes, 1 gross assorted                                                                                                                | ... .. | 0  | 7  | 0 |



|      |                                                                                                                                                                   |              |    |    |   |
|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----|----|---|
| 398  | Cork Borers, Set of 6 Brass Tube, best                                                                                                                            | ... ..       | £0 | 3  | 6 |
| 412  | Covers, 1 Doz. Concave, for Beakers, assorted                                                                                                                     | ... ..       | 0  | 4  | 6 |
| 413  | Crucibles, with cover, 2 doz. Berlin Porcelain, No. 1,<br>capacity $\frac{3}{4}$ ounce                                                                            | .. ... ..    | 0  | 16 | 0 |
| 420  | Crucibles, 3 doz. Gold Assay, $1\frac{1}{4} \times 1\frac{1}{4}$                                                                                                  | ... ..       | 0  | 7  | 6 |
| 422  | „ 6 doz. London Round Fire Clay, No. 5                                                                                                                            | ... ..       | 0  | 18 | 0 |
| 424  | Covers for ditto, 1 doz.                                                                                                                                          | ... ..       | 0  | 1  | 9 |
| 427  | Crucibles, 1 doz. Salamander, No. 8                                                                                                                               | ... ..       | 1  | 10 | 0 |
|      | Covers for ditto, 3 only                                                                                                                                          | ... ..       | 0  | 3  | 0 |
| 429  | Fluxing Pots, 6 doz. Battersea Fire Clay, No. 6                                                                                                                   | ... ..       | 0  | 10 | 0 |
| 435  | Scorifiers, 12 doz. Clay, $2\frac{1}{2}$ in.                                                                                                                      | ... ..       | 0  | 8  | 0 |
| 436  | Roasting Dishes, 1 doz. Clay, 3 in.                                                                                                                               | ... ..       | 0  | 1  | 9 |
| 442  | Platinum Crucible, and Cover                                                                                                                                      | ... .. about | 2  | 10 | 0 |
| 452  | Cupels, 12 doz. Best French Bone Ash, No. 7, $1\frac{1}{2}$ in.                                                                                                   | ... ..       | 1  | 13 | 0 |
| 453  | Cupel Mould, polished Steel, $1\frac{1}{2}$ in.                                                                                                                   | ... ..       | 0  | 15 | 0 |
| 454  | Cupel Tray, sheet iron, with 16 divisions                                                                                                                         | ... ..       | 0  | 6  | 6 |
| 553  | Files, 2 each Triangular and Round, with handles                                                                                                                  | ... ..       | 0  | 2  | 4 |
| 574  | Filter Paper, 2 Packets each Rhenish (No. 595) 5 & $7\frac{1}{4}$ in.                                                                                             | ... ..       | 0  | 3  | 0 |
| 587  | Flasks, 1 doz. each Best Bohemian, 8, 12, 20 oz.                                                                                                                  | ... ..       | 1  | 2  | 0 |
| 589  | „ 1 „ „ German, conical form, 8 oz.                                                                                                                               | ... ..       | 0  | 3  | 0 |
| 599  | „ 1 „ „ Conical Assay, 8 oz.                                                                                                                                      | ... ..       | 0  | 4  | 0 |
| 611  | Flatting Mill, best make, steel rollers, 2 in. diameter                                                                                                           | ... ..       | 4  | 15 | 0 |
| 632  | Forceps, Polished Steel                                                                                                                                           | ... ..       | 0  | 1  | 6 |
| 642  | Funnels, 6 each, best Bohemian Glass, $3\frac{1}{4}$ and $3\frac{3}{4}$ in. diam.,<br>with ground edges, the sides inclined at an angle of $60^\circ$             | ... ..       | 0  | 6  | 6 |
| 642  | Funnels, 1 doz. Best German Glass, 1 in. diameter                                                                                                                 | ... ..       | 0  | 1  | 3 |
| 666  | Funnel Holder, Teak, for 2, square bottom                                                                                                                         | ... ..       | 0  | 3  | 0 |
| 678  | Furnace, Sheet Iron, lined with Fire Bricks, with cast-iron<br>rings and Sand Bath, for Assaying and Cupelling, depth of<br>body 19 in., internal diameter 12 in. | ... ..       | 5  | 5  | 0 |
|      | Sheet Iron Elbow and Pipe, extra                                                                                                                                  | ... ..       | 0  | 7  | 6 |
| 678  | Muffles for above, 1 doz. $11 \times 3\frac{3}{4} \times 3\frac{3}{4}$                                                                                            | ... ..       | 1  | 19 | 0 |
| 810  | Glass Tubing, 3 lbs.                                                                                                                                              | ... ..       | 0  | 3  | 0 |
| 819  | Glass Rod, 1 lb.                                                                                                                                                  | ... ..       | 0  | 1  | 0 |
| 967  | Spirit Lamps, 2 glass, with ground cap and earthenware<br>wick holder, 4 oz. capacity                                                                             | ... ..       | 0  | 2  | 0 |
| 976  | Rose's Argand Spirit Lamp on tripod stand, and copper<br>chimney, with arrangement for raising and lowering the<br>wick, japanned tin                             | ... ..       | 0  | 12 | 0 |
|      | 1 doz. extra Wicks                                                                                                                                                | ... ..       | 0  | 1  | 0 |
| 1027 | Microscope, with coarse and fine adjustment, circular glass<br>stage, and 1 in. objective, in polished mahogany case                                              | ... ..       | 6  | 10 | 0 |
| 1042 | Magnifying Lens, triple, for examining crystals, &c., or in<br>blowpipe operations, mounted in horn                                                               | ... ..       | 0  | 3  | 6 |



|      |                                                                                                                          |        |
|------|--------------------------------------------------------------------------------------------------------------------------|--------|
| 1049 | Anvil or Stake, for flattening large beads of Gold or silver, $3\frac{1}{2} \times 3\frac{1}{2} \times 3$ ... ..         | £1 5 0 |
| 1051 | Steel Anvil, $4 \times 4 \times 1$ in., for flattening beads of gold or silver ... ..                                    | 0 7 6  |
| 1053 | Steel Vice, to screw to table, extra strong ... ..                                                                       | 0 10 6 |
| 1055 | Chisel for cutting metals ... ..                                                                                         | 0 1 6  |
| 1057 | Hammer, steel ends, pointed ... ..                                                                                       | 0 3 6  |
| 1058 | „ „ rounded ... ..                                                                                                       | 0 3 6  |
| 1065 | Mallet, boxwood ... ..                                                                                                   | 0 3 0  |
| 1066 | Plyers, black steel ... ..                                                                                               | 0 1 0  |
| 1067 | „ Cutlers' steel, for cutting metals and wire... ..                                                                      | 0 2 6  |
| 1068 | Assay Shears for cutting metals, 10 in. ... ..                                                                           | 0 3 6  |
| 1069 | Assay Scoops 1 each copper, with wood handle, 6 in. & 8 in.                                                              | 0 8 6  |
| 1070 | Horn Scoops, 3 ... ..                                                                                                    | 0 1 6  |
| 1073 | Ingot Mould, conical form, with foot, turned inside ...                                                                  | 0 5 6  |
| 1076 | „ „ turned and polished steel, 2 holes, with handle                                                                      | 0 6 6  |
| 1079 | „ „ cast iron, 2, for bars, $6 \times 1\frac{7}{8} \times 2$ ... ..                                                      | 0 4 0  |
| 1087 | Mortar and Pestle, iron, bowl shaped, turned inside, $7\frac{3}{4}$ in.                                                  | 0 7 0  |
| 1088 | „ „ „ bell „ „ 10 in.                                                                                                    | 0 12 6 |
| 1089 | „ „ Wedgwood, $6\frac{1}{2}$ in. ... ..                                                                                  | 0 3 0  |
| 1098 | „ „ Cast steel, 7 in. ... ..                                                                                             | 1 0 0  |
| 1096 | „ „ Agate, highly polished, for pulverization of hard substances, 3 in. ... ..                                           | 0 17 0 |
| 1186 | Retort, cast iron, for Mercury, &c., with long leading tube, to screw, loose head secured by bolts, capacity 5 pints ... | 1 1 0  |
| 1187 | Ditto, ditto, with Condenser, 5 pints ... ..                                                                             | 1 15 0 |
|      | Sand Bath Dishes, 1 each, 6 and 8 in. ... ..                                                                             | 0 0 10 |
| 1224 | Sieves, brass wire, 6 in. diameter, japanned tin frames with cover and bottom, set of 3, meshes Nos. 30, 60, 90 ...      | 0 8 6  |
| 1227 | Spatulas, 3 steel, nickel-plated to prevent rust ... ..                                                                  | 0 5 0  |
| 1235 | „ 1 platinum ... .. about                                                                                                | 1 0 0  |
| 1361 | Tripod Stands, 2 iron, triangular, $8 \times 7\frac{1}{2}$ in. ... ..                                                    | 0 2 0  |
| 1371 | Still, tin-plate, with pure tin condensing worm, in tin-plate reservoir, 2 gallons ... ..                                | 1 6 0  |
| 1426 | Test Tubes, 3 dozen best Bohemian glass, $5 \times \frac{5}{8}$ in. ...                                                  | 0 1 6  |
| 1434 | Test Tube Cleaners, 3, with Sponge or bristle ends ...                                                                   | 0 0 6  |
| 1441 | Test Tube Holder, flat form, strong spring clip, in wood handle ... ..                                                   | 0 0 10 |
| 1447 | Test Tube Stand, teak, with draining pegs, 8 holes & pegs                                                                | 0 1 3  |
| 1505 | Crucible Tongs, 8 in., brass ... ..                                                                                      | 0 2 0  |
| 1511 | „ „ 8 in., nickel-plated ... ..                                                                                          | 0 2 6  |
| 1515 | Bow Tongs, iron, length 18 in. ... ..                                                                                    | 0 3 0  |
| 1516 | „ „ „ with bend, length 18 in. ... ..                                                                                    | 0 4 6  |
| 1517 | Basket „ „ length 28 in. ... ..                                                                                          | 0 7 6  |



|      |                                                                                             |     |                             |           |     |   |      |
|------|---------------------------------------------------------------------------------------------|-----|-----------------------------|-----------|-----|---|------|
| 1519 | Furnace Tongs with bend, length 18 in.                                                      | ... | ...                         | ...       | £0  | 2 | 6    |
| 1520 | Charcoal                                                                                    | „   | „                           | 18 in.    | ... | 0 | 3 0  |
| 1522 | Cupel                                                                                       | „   | elastic iron, length 28 in. | ...       | ... | 0 | 3 6  |
| 1523 | Scorifier                                                                                   | „   | length 24 in.               | ...       | ... | 0 | 3 0  |
| 1524 | Iron Poker, for arranging fuel in furnace, 3 feet                                           | ... | ...                         | ...       | ... | 0 | 2 6  |
| 1525 | Bar Scraper, length 3 ft. 6 in.                                                             | ... | ...                         | ...       | ... | 0 | 3 6  |
| 1528 | Triangles, 1 doz. covered with pipe-clay                                                    | ... | ...                         | ...       | ... | 0 | 2 0  |
| 1669 | Washing Flask, Gmelin's, 16 oz. capacity, fitted with bent tube and cork...                 | ... | ...                         | ...       | ... | 0 | 1 6  |
| 1687 | Watch Glasses, 2 doz. 2 in. diameter                                                        | ... | ...                         | ...       | ... | 0 | 2 0  |
| 1104 | Buckets, Iron, enamelled inside for Mercury, Japanned black or red outside. Diameter at top | 6   | 8                           | 10 in.    |     |   |      |
|      |                                                                                             | 3/6 | 4/6                         | 6/6 each. |     |   |      |
| 1105 | Gold-Washing Pans, 4, Sheet Iron, 16 in. diam.                                              | ... | ...                         | ...       | ... | 0 | 12 0 |
|      | Scissors, 1 Pair                                                                            | ... | ...                         | ...       | ... | 0 | 1 0  |
|      | Chamois Leathers, best quality, 3                                                           | ... | ...                         | ...       | ... | 0 | 4 6  |
|      | Brushes, 2 Hard, for cleaning Prills                                                        | ... | ...                         | ...       | ... | 0 | 1 6  |
|      | Tweezers for holding Prills                                                                 | ... | ...                         | ...       | ... | 0 | 2 6  |

## CHEMICALS.

|            |                                               |                       |     |    |      |
|------------|-----------------------------------------------|-----------------------|-----|----|------|
| 12 W. Qts. | Hydrochloric Acid, Pure, 78 lb. at 5d. 32/6., | 12 Bots., stopd. 8/   | £1  | 19 | 6    |
| 8 „        | Nitric „ „ 60 „ 8d. 40/                       | 8 „ „ 5/4             | 2   | 5  | 4    |
| 4 „        | Sulphuric „ „ 40 „ 6d. 20/                    | 4 „ „ 2/8             | 1   | 2  | 8    |
| 12 „       | Ammonia Solution, 880, 54 „ 8d. 36/           | 12 „ „ 8/             | 2   | 4  | 0    |
| 56 lb.     | Bone Ash, best, for Cupels „ at 50/ 25/       | Tins                  | 6/  | 1  | 11 0 |
| 56 lb.     | Borax, refined ... .. 6d. 28/                 | „                     | 6/  | 1  | 14 0 |
| or 28 lb.  | „ calcined ... .. 1/2 32/8                    | „                     | 12/ | 2  | 4 8  |
| 7 lb.      | Charcoal Powder, wood ... 8d. 4/8             | „                     | 2/  | 0  | 6 8  |
| 1 lb.      | Black Flux ... .. 6/                          | Stopd. Bott. 10d.     | 0   | 6  | 10   |
| 7 lb.      | Lead Foil, Assay ... .. 8d.                   | „                     | „   | 0  | 4 8  |
| 7 lb.      | Lead Grain ... .. 8d. 4/8                     | Bottle, 10d.          | 0   | 5  | 6    |
| 1 cwt.     | Litharge, best ... .. 40/                     | Keg.                  | 2/  | 2  | 2 0  |
|            | Mercury, metal, (varies) ... ..               | Per Bottle,           | 7   | 10 | 0    |
|            | Methylated Spirit ... ..                      | Per Gall.             | 0   | 4  | 0    |
| 56 lb.     | Potassium Cyanide ... .. 2/ 112/              | „ Jars 8/             | 6   | 0  | 0    |
| 28 lb.     | „ Nitrate ... .. 6d. 14/                      | Patent Capd. Jar, 5/6 | 0   | 19 | 6    |
| 56 lb.     | Sodium Carbonate, dried ... 6d. 28/           | „ Tins, 9/            | 1   | 17 | 0    |

*The above List is intended as a guide only, of the usual requirements as an outfit for Gold and Silver Assay, and the quantities, &c. would necessarily have to be varied according to circumstances.*



# TOWNSON & MERCER'S

## Price List of Pure Chemicals,

### FOR ANALYSIS, &c.,

### 89, BISHOPSGATE STREET WITHIN, LONDON, E.C.

As a general rule, where the Price is quoted at per ounce, larger quantities will be charged at as many shillings per pound as the ounce is pence, and vice versa.

|                                        | s.   | d. |    | s.                                       | d.    |   |    |
|----------------------------------------|------|----|----|------------------------------------------|-------|---|----|
| Acetone, Coml. ....                    | lb.  | 2  | 0  | Acid, Phosphoric, Pur. Sol. concent. . . | lb.   | 2 | 6  |
| " pure .....                           | oz.  | 1  | 6  | " " glacial, pure .....                  | oz.   | 0 | 4  |
| Acid, Acetic, pure .....               | lb.  | 0  | 8  | " Phosphorous .....                      | "     | 0 | 8  |
| " " " W. Qt. ....                      | "    | 0  | 6  | " Phospho. Molybdic .....                | "     | 5 | 0  |
| " " glacial at 50° F. ....             | oz.  | 0  | 2  | " Picric (Carbazotic) crystal .....      | "     | 0 | 3  |
| " " " W. Qt. ....                      | lb.  | 1  | 0  | " Pyrogallic .....                       | "     | 1 | 4  |
| " Arsenic, Dry, pure .....             | "    | 2  | 0  | " Salicylic .....                        | "     | 1 | 0  |
| " Arsenious, lb. 8d. ....              | oz.  | 0  | 2  | " Silicic, coml. ....                    | lb.   | 0 | 6  |
| " Benzoic .....                        | "    | 0  | 9  | " " pure .....                           | oz.   | 0 | 9  |
| " " from Gum .....                     | "    | 1  | 6  | " Stearic .....                          | lb.   | 2 | 0  |
| " Boracic, pure, lb. 10d. ....         | "    | 0  | 2  | " Succinic, pure .....                   | oz.   | 0 | 8  |
| " " fused .....                        | "    | 0  | 6  | " Sulphuric, coml. ....                  | lb.   | 0 | 3  |
| " Butyric .....                        | "    | 0  | 9  | " " W. Qt. ....                          | "     | 0 | 2  |
| " " pure .....                         | "    | 1  | 6  | " " Carboy .....                         | "     | 0 | 1  |
| " Carboic, crystal .....               | lb.  | 2  | 6  | " " pure .....                           | "     | 0 | 6  |
| " Chlorochromic .....                  | oz.  | 5  | 6  | " " " for Analysis .....                 | "     | 1 | 0  |
| " Chromic, crystal, lb. 5/ .....       | oz.  | 0  | 9  | " " " Nordhausen .....                   | "     | 0 | 10 |
| " Cinnamic .....                       | "    | 6  | 0  | " Sulphurous, W. Qt. 4d. ....            | "     | 0 | 6  |
| " Citric, purified, lb. 3/6 .....      | "    | 0  | 4  | " Tannic .....                           | oz.   | 0 | 4  |
| " Fluoric .....                        | lb.  | 1  | 4  | " Tartaric .....                         | lb.   | 2 | 6  |
| " " re-distilled .....                 | "    | 3  | 0  | " " pure .....                           | "     | 4 | 0  |
| " Formic, concent. ....                | "    | 3  | 6  | " Titanic .....                          | oz.   | 6 | 0  |
| " Gallic .....                         | oz.  | 0  | 6  | " Tungstic, pure .....                   | "     | 1 | 6  |
| " Hippuric, crystal .....              | "    | 5  | 0  | " Uric .....                             | "     | 2 | 6  |
| " Hydrochloric, coml. ....             | lb.  | 0  | 3  | " Valerianic .....                       | "     | 1 | 6  |
| " " W. Qt. ....                        | "    | 0  | 2  | " Vanadic .....                          | "     | 6 | 0  |
| " " Carboy .....                       | "    | 0  | 1  | Alcohol, absolute, pint 5/ .....         | "     | 0 | 4  |
| " " pure .....                         | "    | 0  | 5  | " Amylic, coml. ....                     | pint. | 1 | 0  |
| " " " for Analysis .....               | "    | 1  | 0  | " " pure .....                           | oz.   | 0 | 3  |
| " Hydrofluosilicic .....               | oz.  | 0  | 2  | " Methylic pure .....                    | "     | 0 | 8  |
| " Hydrosulphuric Sol. in Glycerine lb. | 3    | 0  | 0  | Alizarine, pure artificial .....         | "     | 3 | 0  |
| " Hydriodic .....                      | oz.  | 2  | 0  | Aldehyde .....                           | "     | 2 | 0  |
| " Iodic .....                          | "    | 3  | 0  | Alloxan, crystal .....                   | "     | 4 | 6  |
| " Lactic, concent. ....                | "    | 1  | 0  | Alum, Ammonia .....                      | lb.   | 0 | 8  |
| " Malic, crystal .....                 | "    | 3  | 6  | " Chrome .....                           | "     | 1 | 0  |
| " Meconic .....                        | "    | 10 | 0  | " Iron .....                             | "     | 1 | 0  |
| " Molybdic .....                       | "    | 0  | 10 | " Potash .....                           | "     | 0 | 6  |
| " Nitric, coml. ....                   | lb.  | 0  | 6  | " Roche .....                            | "     | 1 | 0  |
| " " W. Qt. ....                        | "    | 0  | 5  | Alumina, Oxide, precipitated, pure ..oz. | 1     | 0 | 0  |
| " " Carboy .....                       | "    | 0  | 4  | " " Hydrate, pure .....                  | "     | 0 | 6  |
| " " pure .....                         | "    | 0  | 8  | " " " coml. ....                         | lb.   | 1 | 0  |
| " " " for Analysis .....               | "    | 1  | 0  | " " Moist .....                          | "     | 1 | 6  |
| " " " Sp. Gr. 1.5 .....                | "    | 1  | 6  | " Phosphate .....                        | oz.   | 0 | 8  |
| " Nitrous .....                        | "    | 0  | 8  | " Sulphate .....                         | lb.   | 0 | 6  |
| " Osmic .....                          | Tube | 2  | 6  | " " cryst. purif. ....                   | "     | 1 | 6  |
| " " Solution 1 o/o .....               | oz.  | 3  | 0  | " " pure .....                           | oz.   | 1 | 0  |
| " Oxalic, lb. 9d. ....                 | "    | 0  | 2  | " Tannate .....                          | "     | 0 | 6  |
| " " pure, for Analysis .....           | "    | 0  | 3  | Aluminium, Sheet or Wire .....           | "     | 7 | 0  |
| " Phosphoric Anhydrous ..              | "    | 1  | 3  | " Leaves .....                           | book  | 1 | 6  |
| " " Crystal .....                      | "    | 0  | 4  | " Chloride, pure .....                   | oz.   | 1 | 6  |







|                                          | s.       | d.   |                                           | s.     | d.   |
|------------------------------------------|----------|------|-------------------------------------------|--------|------|
| Calcium, Iodide .....                    | oz.      | 2 6  | Copper Chloride (green) .....             | oz.    | 0 3  |
| " Malate .....                           | "        | 4 0  | " Nitrate .....                           | "      | 0 3  |
| " Nitrate, fused .....                   | "        | 0 3  | " Oxide (black) .....                     | lb.    | 2 0  |
| " Oxide, pure, from marble lb.           |          | 2 0  | " " <i>for organic Analysis</i> .....     | "      | 5 0  |
| " Phosphate, coml. best .....            | oz.      | 0 6  | " " Chertiers .....                       | oz.    | 0 3  |
| " " pure .....                           | oz.      | 0 3  | " Phosphate .....                         | "      | 0 6  |
| " Phosphide .....                        | "        | 0 6  | " Suboxide .....                          | "      | 0 4  |
| " Sulphate, pure precip. ....            | "        | 0 2  | " Sulphate, cwt. 35/ .....                | lb.    | 0 5  |
| " Sulphite " " .....                     | "        | 0 2  | " " recryst. pure .....                   | "      | 0 10 |
| " Sulphide .....                         | "        | 0 3  | " " purest .....                          | "      | 2 0  |
| " " Phosphorescent .....                 | "        | 5 0  | " Sulphide, fused .....                   | oz.    | 0 3  |
| " Bisulphite, Sol. cwt. 30/ lb.          |          | 0 6  | Cotton Wool .....                         | lb.    | 2 0  |
| Camphor .....                            | oz.      | 0 2  | Creasote, pure from wood .....            | oz.    | 0 8  |
| Canada Balsam .....                      | "        | 0 3  | Cryolite .....                            | "      | 0 2  |
| Caoutchouc, sheet .....                  | "        | 0 10 | Dextrine (British Gum) .....              | lb.    | 0 6  |
| Carbon, Bisulphide, redrawn .....        | lb.      | 0 10 | Eosine .....                              | oz.    | 1 6  |
| " " W. Qt. ....                          | "        | 0 8  | Ether, Acetic .....                       | "      | 0 6  |
| " Tetrachloride .....                    | oz.      | 0 8  | " Hydrochloric .....                      | "      | 0 10 |
| " Crushed for Battery, cwt. 12/ lb.      |          | 0 2  | " Petroleum, pint 1/ .....                | "      | 0 2  |
| ◀ Cerite .....                           | oz.      | 0 2  | " Sulphuric, Methylic .....               | lb.    | 1 6  |
| Cerium, Metal .....                      | gr.      | 2 0  | " " Rectified .....                       | oz.    | 0 6  |
| " Chloride .....                         | oz.      | 1 4  | " " washed .....                          | "      | 0 8  |
| " Nitrate .....                          | "        | 0 9  | " " <i>Enanthic (Oil of Cognac)</i> ..... | "      | 5 0  |
| " Oxalate .....                          | "        | 0 4  | Fehling's Test Solution .....             | "      | 0 6  |
| " Oxide .....                            | "        | 2 0  | Feldspar .....                            | "      | 0 2  |
| " Sulphate .....                         | "        | 1 3  | Flux, Black .....                         | "      | 0 6  |
| Charcoal, Animal, grain .....            | lb.      | 0 6  | " White .....                             | "      | 0 6  |
| " " powder .....                         | "        | 0 8  | Fluor Spar .....                          | lb.    | 0 4  |
| " " " pure .....                         | oz.      | 0 4  | Fuschine .....                            | oz.    | 2 0  |
| " Wood, lump .....                       | lb.      | 0 4  | Fusel Oil .....                           | pint   | 1 0  |
| " " powder .....                         | "        | 0 8  | Fusible metal .....                       | oz.    | 1 0  |
| " Swedish Blowpipe, in blocks ..         | "        | 2 6  | Galena .....                              | lb.    | 1 0  |
| Chloral Hydrate .....                    | oz.      | 0 6  | Gelatine, finest .....                    | oz.    | 0 6  |
| Chlorine Solution .....                  | lb.      | 0 6  | Glass, powdered .....                     | lb.    | 0 10 |
| Chloroform .....                         | oz.      | 0 6  | " spun for filtering .....                | oz.    | 2 0  |
| " Methylated .....                       | "        | 0 3  | Glucina .....                             | dr.    | 4 0  |
| Chrome Iron Ore .....                    | "        | 0 2  | Glucose ( <i>Grape Sugar</i> ) .....      | lb.    | 0 9  |
| Chromium, Oxide ( <i>Hydrate</i> ) ..... | "        | 0 4  | Glue, Marine .....                        | "      | 1 6  |
| " " green .....                          | "        | 0 6  | Glycerine, distilled, pure .....          | "      | 1 2  |
| " Chloride cryst. subld. ....            | "        | 4 0  | Gold Leaf .....                           | book   | 2 0  |
| " " sol. green .....                     | "        | 0 4  | " Chloride, sol. ....                     | oz.    | 2 6  |
| " Sulphate, cryst. ....                  | "        | 0 6  | " " crystals .....                        | 15 gr. | 2 0  |
| " metal .....                            | tube     | 2 6  | " Oxide .....                             | scr.   | 6 0  |
| Cinchonine, pur. cryst. ....             | oz.      | 2 6  | " Wire or Foil .....                      | "      | 6 0  |
| Cinnabar .....                           | "        | 0 6  | Gum Arabic .....                          | oz.    | 0 8  |
| Clay, Stourbridge .....                  | lb.      | 0 2  | " Damar .....                             | "      | 0 2  |
| Cobalt metal .....                       | oz.      | 2 6  | " Shellac .....                           | "      | 0 2  |
| " Acetate, crystal .....                 | "        | 1 4  | " " powdered .....                        | "      | 0 4  |
| " " solution .....                       | "        | 0 6  | Gun Cotton .....                          | "      | 1 6  |
| " Carbonate .....                        | "        | 1 6  | Gypsum, for casts .....                   | lb.    | 0 3  |
| " Chloride, crystal .....                | "        | 1 0  | Hydrogen Peroxide, 10 Vol. ....           | lb.    | 1 6  |
| " " solution .....                       | "        | 0 6  | Hydrokinone .....                         | oz.    | 4 0  |
| " Nitrate, crystal .....                 | "        | 1 0  | Indigo, best .....                        | oz.    | 0 9  |
| " " solution .....                       | "        | 0 6  | " Sulphate, sol. ....                     | "      | 0 2  |
| " Oxide, pure .....                      | "        | 3 0  | Indigotine .....                          | dr.    | 4 0  |
| " Sulphate .....                         | "        | 1 0  | " Paste .....                             | lb.    | 2 6  |
| Copper Wire or Sheet .....               | lb.      | 1 6  | " Carmine .....                           | oz.    | 1 6  |
| " Sheet, thin .....                      | lb.      | 3 0  | Iodine ( <i>varies</i> ) .....            | "      | 1 4  |
| " Filings .....                          | oz.      | 0 2  | " Re-sublimed .....                       | "      | 1 6  |
| " Leaf .....                             | per book | 0 2  | Iodoform .....                            | "      | 1 3  |
| " Foil ( <i>Electrotype</i> ) .....      | oz.      | 0 6  | Iridium .....                             | dr.    | 35 0 |
| " Turnings ( <i>Shavings</i> ) .....     | lb.      | 1 6  | " Chloride .....                          | "      | 20 0 |
| " Powder .....                           | oz.      | 0 8  |                                           |        |      |
| " Acetate, crystal .....                 | "        | 0 4  |                                           |        |      |
| " Ammon. Sulph. ....                     | "        | 0 3  |                                           |        |      |
| " Arseniate .....                        | "        | 0 6  |                                           |        |      |
| " Arsenite, pure .....                   | "        | 0 4  |                                           |        |      |
| " Carbonate .....                        | "        | 0 3  |                                           |        |      |



|                                           | s.   | d. |    | s.                                     | d.              |
|-------------------------------------------|------|----|----|----------------------------------------|-----------------|
| Iron, Metal, Filings                      | lb.  | 0  | 6  | Magnesium Wire or Ribbon, in hanks not |                 |
| „ powdered, pure                          | oz.  | 0  | 2  | less than 1 oz.                        | 2 0             |
| „ „ <i>reduced by hydrogen</i>            | „    | 0  | 4  | Filings                                | 2 0             |
| „ Wire, for burning                       | hank | 0  | 2  | Citrate Granular, Eff.                 | 2 6             |
| „ „ pure, on reels                        | oz.  | 0  | 4  | Wire                                   | 0 1½            |
| „ Acetate, solid                          | „    | 1  | 4  | Ribbon                                 | 0 2             |
| „ „ solution                              | „    | 0  | 2  | Bromide                                | 1 6             |
| „ Ammon-Citrate                           | „    | 0  | 3  | Carbonate, lb. 1/                      | 0 2             |
| „ Ammon-Sulph                             | lb.  | 0  | 10 | Chloride                               | 1 4             |
| „ Citrate and Quinine                     | oz.  | 1  | 6  | Nitrate, fused                         | 0 2             |
| „ Ferrocyanide                            | „    | 0  | 6  | Oxalate                                | 0 6             |
| „ Lactate                                 | „    | 0  | 4  | Oxide ( <i>Calcined</i> )              | 0 3             |
| „ Nitrate-per, solution                   | „    | 0  | 2  | Phosphate, pure                        | 0 6             |
| „ Oxalate                                 | „    | 0  | 3  | Ammon-Phosphate                        | 0 6             |
| „ Oxide Red                               | lb.  | 1  | 0  | Sulphate, re-cryst.                    | 0 6             |
| „ Peroxide ( <i>black magnetic</i> )      | oz.  | 0  | 2  | Manganese, Peroxide, cwt. 12/          | 28lb. 2d. „ 0 3 |
| „ Phosphate                               | „    | 0  | 3  | Granular, cwt. 12/                     | 28lb. 2d. „ 0 3 |
| „ Perchloride, crystal subld.             | „    | 1  | 0  | Needle, cwt. 24/                       | 28lb. 4d. „ 0 6 |
| „ „ solid                                 | lb.  | 1  | 0  | Oxide Hydrate                          | 0 6             |
| „ „ solution                              | „    | 0  | 6  | Borate                                 | 0 2             |
| „ Persulphate                             | oz.  | 0  | 3  | Carbonate, pure                        | 0 3             |
| „ Protosulphate                           | lb.  | 0  | 3  | Chloride, pure                         | 0 3             |
| „ „ pure                                  | „    | 0  | 6  | Sulphate „                             | 0 4             |
| „ „ Granular                              | „    | 1  | 0  | Mannite                                | 0 6             |
| „ Sulphide, fused, small lumps            | „    | 0  | 6  | Marble, white                          | lb. 0 3         |
| „ „ „ rods                                | „    | 0  | 8  | Mercury, Metal (varies)                | 3 6             |
| Isinglass, finest Russian                 | oz.  | 2  | 0  | Bicyanide                              | 1 0             |
| „ „ Brazil                                | „    | 1  | 0  | Bichloride                             | 0 6             |
| Kaolin                                    | lb.  | 0  | 6  | Chloride                               | 0 6             |
| Lead, foil ( <i>assay</i> )               | „    | 0  | 8  | Iodide                                 | 1 0             |
| „ grain                                   | „    | 0  | 8  | Bin-Iodide                             | 2 6             |
| „ Test Paper                              | book | 0  | 2  | Nitrate-proto                          | 0 8             |
| „ Acetate                                 | lb.  | 0  | 8  | Nitrate-per                            | 0 8             |
| „ „ pure, lb. 1/4                         | oz.  | 0  | 2  | Nitric Oxide                           | 0 6             |
| „ „ „ Basic                               | „    | 0  | 2  | Oxide                                  | 0 6             |
| „ „ „ „ cryst.                            | „    | 0  | 6  | Peroxide                               | 0 8             |
| „ Borate                                  | „    | 0  | 4  | Phosphate                              | 1 4             |
| „ Carbonate                               | lb.  | 0  | 8  | Sulphate, for batteries                | 3 0             |
| „ „ pure                                  | oz.  | 0  | 3  | „ yellow                               | 0 6             |
| „ Chloride, pure                          | „    | 0  | 2  | Sulphocyanide                          | 0 4             |
| „ Chromate, fused                         | lb.  | 3  | 6  | Sulphide                               | 0 4             |
| „ Iodide                                  | oz.  | 3  | 0  | Bisulphide ( <i>Vermilion</i> )        | 0 4             |
| „ Malate                                  | „    | 4  | 6  | Metaphenyl-diam-Chlor, dr. 1/3         | 8 0             |
| „ Nitrate                                 | lb.  | 0  | 6  | Methylated Spirit, gal. 4/             | pint 0 7        |
| „ „ pure, lb. 1/6                         | oz.  | 0  | 2  | Microcosmic Salt                       | oz. 0 4         |
| „ Oxide (litharge), 40/ cwt.              | lb.  | 0  | 6  | Molybdenum Metal                       | per tube 2 6    |
| „ Peroxide                                | oz.  | 0  | 3  | Morphia, pure cryst.                   | oz. 12 6        |
| „ „ ( <i>Puce</i> ) pure                  | „    | 0  | 5  | Hydrochlorate                          | „ 8 0           |
| „ Protoxide, Hydrate                      | „    | 0  | 3  | Naphtha, Wood                          | pint 1 3        |
| „ Red Oxide ( <i>Minium</i> ) cwt. 40/    | lb.  | 0  | 6  | Dry, for Potassium                     | oz. 0 3         |
| „ Sulphate, pure                          | „    | 1  | 3  | Mineral                                | pint 1 0        |
| „ Tartrate                                | oz.  | 0  | 4  | Naphthaline                            | lb. 1 0         |
| Lepidolite                                | „    | 0  | 2  | crystal                                | oz. 0 4         |
| Line Cylinders, in tins containing 1 doz. |      | 2  | 6  | Nickel, Metal, in cubes                | oz. 0 6         |
| Lithium, Metal                            | gr.  | 2  | 6  | Carbonate                              | „ 0 6           |
| Lithium, Bromide                          | oz.  | 1  | 6  | Chloride                               | „ 0 4           |
| Carbonate                                 | „    | 1  | 6  | „ Solution                             | „ 0 2           |
| Chloride                                  | „    | 1  | 6  | Oxalate                                | „ 0 9           |
| Iodide                                    | „    | 2  | 6  | Oxide                                  | „ 0 4           |
| Oxide ( <i>pure Lithia</i> )              | „    | 5  | 6  | „ pure                                 | „ 0 8           |
| Sulphate                                  | „    | 1  | 6  | Sulphate, crystal                      | „ 0 2           |
| Litmus, lb. 1/6                           | „    | 0  | 2  | Oil, Olive, best                       | lb. 1 6         |
| Litmus Paper, blue, doz. 1/3              | book | 0  | 2  | of Cloves                              | oz. 0 10        |
| „ red, doz. 1/4                           | „    | 0  | 2  | Osmium, Metal                          | dr. 35 0        |
| „ neutral                                 | „    | 0  | 2  | Oxygen, Comp., 14 lb. 8d.              | lb. 0 10        |
| Lycopodium                                | oz.  | 0  | 3  |                                        |                 |



|                                     | s.  | d.   |                                     | s.   | d.   |
|-------------------------------------|-----|------|-------------------------------------|------|------|
| Palladium, Metal                    | dr. | 25 0 | Potassium, Sulphate                 | lb.  | 0 8  |
| " Chloride, sol.                    | oz. | 3 0  | " " pure, lb. 1/6                   | oz.  | 0 2  |
| " Nitrate, sol.                     | "   | 3 0  | " Sulphide, lb. 1/4                 | "    | 0 2  |
| Paraffin, Solid, pure               | lb. | 1 0  | " Sulphite                          | "    | 0 3  |
| Phenol-Phthaleine                   | oz. | 4 6  | " Sulphocyanide                     | "    | 0 4  |
| Phenylendiamin (Meta.) Chlor.       | "   | 10 0 | " Tartrate                          | "    | 0 3  |
| Phosphorus                          | "   | 0 6  | " " and Soda                        | lb.  | 1 6  |
| " Amorphous                         | "   | 0 9  | " (Rochelle Salts.)                 |      |      |
| " Pentachloride                     | "   | 1 0  | " and Sodium Carbonate, pure        |      |      |
| Platinum Wire or Foil, oz. 38/ Troy | dr. | 5 0  | dry, lb. 5/                         | oz.  | 0 6  |
| " Sponge                            | "   | 5 0  | Pumice Stone                        | lb.  | 0 8  |
| " Bi-Chloride                       | oz. | 18 0 | Quinine Sulphate (varies)           | oz.  | 4 0  |
| " " Solution                        | "   | 1 6  | Rhodium                             | tube | 5 0  |
| " Black                             | "   | 60 0 | " Oxide                             | "    | 2 6  |
| Plumbago, electrotype               | "   | 0 2  | Rouge, Jewellers'                   | oz.  | 0 6  |
| Potash, American                    | lb. | 0 8  | Rubidium, Alum                      | "    | 6 0  |
| Potassium, Metal, oz. 8/            | dr. | 1 3  | " Chloride                          | dr.  | 4 6  |
| " Caustic (stick), lb. 1/3          | oz. | 0 2  | Ruthenium                           | tube | 5 0  |
| " " pure, by Alcohol lb. 4/6        | "   | 0 6  | Rutile                              | oz.  | 0 2  |
| " Solution, sp. gr. 1270            | lb. | 0 10 | Saccharine                          | "    | 5 0  |
| " Acetate                           | oz. | 0 2  | Salicine                            | "    | 1 0  |
| " " pure                            | "   | 0 3  | Santonine                           | "    | 1 0  |
| " Antimoniate, pure                 | "   | 0 9  | Selenium                            | "    | 10 0 |
| " Arseniate                         | "   | 0 3  | Selenite                            | "    | 0 6  |
| " Arsenite                          | "   | 0 4  | Shellac                             | "    | 0 2  |
| " Bicarbonate, crystal              | lb. | 1 0  | Silica, crystal (rock crystal)      | "    | 0 3  |
| " Bichromate                        | "   | 0 8  | " coml.                             | lb.  | 0 6  |
| " " pure                            | "   | 1 4  | " pure                              | oz.  | 0 9  |
| " Binoxalate                        | oz. | 0 2  | Silicon, crystal                    | tube | 5 0  |
| " Bisulphate, pure, lb. 1/6         | "   | 0 2  | Silver Leaf                         | book | 1 0  |
| " Bisulphite, cryst. 100°           | "   | 0 4  | " Granulated                        | oz.  | 8 0  |
| " Bitartrate                        | "   | 0 2  | " Precipitated                      | "    | 10 0 |
| " Borate                            | "   | 0 4  | " Acetate                           | "    | 6 6  |
| " Bromide, pure, lb. 2/6            | "   | 0 3  | " Bromide                           | "    | 5 6  |
| " Carbonate                         | lb. | 0 8  | " Chloride                          | "    | 5 6  |
| " " Dry                             | "   | 2 0  | " Cyanide                           | "    | 5 6  |
| " " for Analysis, lb. 5/            | oz. | 0 6  | " Iodide                            | "    | 5 6  |
| " Chlorate                          | lb. | 0 10 | " Nitrate, cryst.                   | "    | 3 9  |
| " " pure                            | "   | 1 6  | " " re-cryst.                       | "    | 4 0  |
| " Chloride, re-cryst. lb. 1/6       | oz. | 0 2  | " " fused                           | "    | 4 0  |
| " Chromate                          | lb. | 1 6  | " Oxide                             | "    | 6 6  |
| " " pure                            | oz. | 0 3  | " Platinized Sheet                  | "    | 10 0 |
| " Citrate                           | "   | 0 6  | " Sulphate                          | "    | 6 6  |
| " Cyanide, fused, 2/ lb.            | "   | 0 3  | " Wire or Sheet, pure               | "    | 7 6  |
| " " sticks, 1 lb. bottles           | "   | 2 6  | Soap, Test (Clarke's)               | "    | 0 6  |
| " " gold, lb. 5/                    | oz. | 0 6  | " Castile, lb. 1/                   | "    | 0 2  |
| " " crystal, pure                   | "   | 1 4  | Soda Lime, for Organic Analysis     | lb.  | 1 2  |
| " Ferricyanide                      | "   | 0 3  | " Ash, cwt. 15/                     | "    | 0 2  |
| " " pure                            | "   | 0 6  | Sodium, Metal                       | oz.  | 1 0  |
| " Ferrocyanide                      | lb. | 1 3  | " Caustic, Lump, 28lb. 4d.          | lb.  | 0 6  |
| " (Prussiate Potash)                |     |      | " " White, stick, lb. 1/3           | oz.  | 0 2  |
| " " pure                            | oz. | 0 3  | " " " pure by Alcohol,              |      |      |
| " Fluoride                          | "   | 0 10 | lb. 4/6                             | oz.  | 0 6  |
| " Hyposulphate                      | "   | 2 6  | Sodium, Caustic, White, from Sodium | oz.  | 1 0  |
| " Hyposulphite                      | oz. | 0 3  | " " Sol., sp. gr. 1270              | lb.  | 0 10 |
| " Iodide (varies)                   | "   | 1 6  | " Acetate, pure                     | "    | 0 1  |
| " Manganate                         | "   | 0 3  | " " fused                           | "    | 1 6  |
| " Molybdate                         | "   | 2 0  | " Aluminate                         | "    | 1 0  |
| " Nitrate                           | lb. | 0 6  | " Amalgam                           | "    | 10 0 |
| " " pure                            | "   | 0 10 | " Ammonio-Phosphate                 | oz.  | 0 4  |
| " Nitrite                           | oz. | 0 3  | " (Microcosmic Salt.)               |      |      |
| " Oxalate, lb. 1/6                  | "   | 0 2  | " Arseniate                         | "    | 0 4  |
| " " pure                            | "   | 0 4  | " Arsenite                          | "    | 0 4  |
| " Permang., pure cryst. lb. 1/3     | "   | 0 2  | " Benzoate                          | "    | 0 2  |
| " Phosphate, pure                   | "   | 0 4  | " Biborate, pure                    | "    | 0 2  |
| " Silicate, sol. cwt. 12/           | lb. | 0 6  | " Bicarbonate, cwt. 30/             | lb.  | 0 6  |
| " " white                           | "   | 4 0  | " " pure                            | "    | 1 0  |
|                                     |     |      | " " crystal                         | "    | 1 0  |



|                                                | s.   | d.  |                                    | s.     | d.   |
|------------------------------------------------|------|-----|------------------------------------|--------|------|
| Sodium, Bichromate                             | lb.  | 0 6 | Tellurium, Metal                   | tube   | 2 6  |
| " Bitartrate                                   | oz.  | 0 3 | Thallium                           | oz.    | 8 0  |
| " Bisulphate                                   | lb.  | 1 3 | Theine                             | "      | 5 0  |
| " Bisulphite                                   | "    | 1 6 | Theobromine                        | dr.    | 12 0 |
| " " pure cryst., 100°                          | "    | 2 0 | Tin, Granulated                    | lb.    | 3 0  |
| " Borate                                       | oz.  | 0 4 | " Foil                             | 2/ & " | 3 0  |
| " Carbonate, crystal, pure                     | lb.  | 1 0 | " Bichloride, fuming               | oz.    | 1 6  |
| " " dry                                        | "    | 0 6 | " Bisulphuret                      | "      | 0 9  |
| " " pure                                       | "    | 1 6 | ( <i>Aurum Musivum.</i> )          |        |      |
| " " pure dry, 3/ lb.                           | oz.  | 0 3 | " Chloride, ordinary               | lb.    | 1 0  |
| ( <i>for Analysis.</i> )                       |      |     | " " pure, <i>for Analysis</i>      | oz.    | 0 3  |
| " Chloride, purest                             | lb.  | 1 0 | " Oxide, grey                      | "      | 0 3  |
| " Ferrocyanide                                 | oz.  | 0 8 | " " pure                           | "      | 0 4  |
| " Fluoride                                     | "    | 0 8 | " Powdered, pure                   | "      | 0 6  |
| " Formiate, pure                               | "    | 1 0 | Tincture Brazil Wood               | "      | 0 4  |
| " Hypochlorite, sol.                           | lb.  | 0 8 | " Cochineal                        | "      | 0 6  |
| " Hyposulphite, 12/ cwt.                       | "    | 0 2 | " Galls                            | "      | 0 4  |
| " " pure                                       | "    | 0 8 | " Hamatine                         | "      | 0 4  |
| " Manganate                                    | "    | 1 0 | " Iodine                           | "      | 0 6  |
| " Molybdate                                    | oz.  | 1 6 | " Litmus                           | "      | 0 2  |
| " Nitrate                                      | lb.  | 0 4 | " Soap                             | "      | 0 6  |
| " " pure                                       | "    | 1 0 | " Turmeric                         | "      | 0 4  |
| " Nitrite                                      | oz.  | 0 4 | Toluol                             | lb.    | 1 6  |
| " Nitroprusside, crystal                       | "    | 4 6 | Tripoli Powder                     | oz.    | 0 3  |
| " Oxalate, pure                                | "    | 0 3 | Tungsten, Metal                    | "      | 14 0 |
| " Phosphate                                    | lb.  | 0 4 | " Oxide                            | "      | 2 6  |
| " " pure                                       | "    | 1 0 | Turmeric Paper, doz. 1/3           | book   | 0 2  |
| " Potassio-Tart                                | "    | 1 6 | Turpentine                         | lb.    | 0 8  |
| " Salicylate, Artificial                       | oz.  | 1 6 | " Distilled                        | "      | 1 0  |
| " Silicate ( <i>water glass</i> )              | lb.  | 0 4 | Ultramarine, Artificial            | oz.    | 4 0  |
| " Stannate                                     | oz.  | 0 2 | Uranium, Oxide, orange             | "      | 2 6  |
| " Sulphate, pure                               | lb.  | 0 2 | " " black                          | "      | 3 6  |
| " " "                                          | "    | 0 8 | " Acetate                          | "      | 3 0  |
| " Sulphite                                     | "    | 0 4 | " Nitrate                          | "      | 2 6  |
| " " pure                                       | "    | 1 0 | " Sulphate                         | "      | 3 0  |
| " Sulphide, cryst.                             | "    | 2 0 | Urea, pure crystal                 | "      | 3 6  |
| " Tartrate                                     | oz.  | 0 3 | " Nitrate, pure                    | "      | 3 6  |
| " Tungstate                                    | lb.  | 1 3 | Vanadium, Chlor. Soln.             | "      | 2 6  |
| " and Potassium Carb. pure dry,<br>lb. 5/      | oz.  | 0 6 | Water, Distilled, pure             | gal.   | 0 6  |
| Starch, pure                                   | "    | 0 2 | Wax, Bees'                         | lb.    | 2 6  |
| " Paper                                        | book | 0 2 | " White                            | "      | 3 6  |
| Stearine                                       | lb.  | 1 6 | Zaffre                             | oz.    | 0 6  |
| Strontium                                      | tube | 2 6 | Zinc, Granulated                   | lb.    | 0 6  |
| " Carbonate, pure                              | oz.  | 0 3 | " Foil                             | oz.    | 0 6  |
| " " native                                     | lb.  | 0 6 | " Sheet                            | lb.    | 0 8  |
| " Chlorate                                     | oz.  | 0 8 | " Dist. free from Iron and Arsenic | "      | 6 0  |
| " Chloride, crystal                            | lb.  | 0 9 | " Purified, Rods                   | "      | 2 0  |
| " " fused                                      | oz.  | 0 3 | " Powdered                         | "      | 0 2  |
| " Nitrate, cryst.                              | lb.  | 0 8 | " Acetate                          | "      | 0 2  |
| " " dried                                      | "    | 0 8 | " Carbonate                        | "      | 0 3  |
| " " pure                                       | oz.  | 0 2 | " Chloride, pure                   | "      | 0 2  |
| " Oxide                                        | oz.  | 0 6 | " Nitrate, fused                   | "      | 0 3  |
| " Sulphate, pure                               | "    | 0 2 | " Oxide                            | "      | 0 2  |
| Sugar of Milk                                  | lb.  | 1 6 | " Phosphate                        | "      | 4    |
| Sulphur, roll                                  | "    | 0 3 | " Sulphate, cryst.                 | lb.    | 0 4  |
| " Sublimed                                     | "    | 0 4 | " " pure                           | "      | 1 0  |
| " pure, crystal                                | oz.  | 0 2 | Zircon                             | oz.    | 3 0  |
| " Precipitated                                 | "    | 0 2 | Zirconium, pure                    | gr.    | 3 0  |
| Suphuretted Hydrogen, Solution in<br>Glycerine | lb.  | 3 0 |                                    |        |      |
| Tannin, pure                                   | oz.  | 0 4 |                                    |        |      |

The Re-Agents described above as "Pure for Analysis," are prepared from pure materials with the utmost care.



Test Solution for Wanklyn's Water Analysis, prepared specially and of guaranteed accuracy.

|                        | <i>s. d.</i>   |                               | <i>s. d.</i>  |
|------------------------|----------------|-------------------------------|---------------|
| Nessler Test .....     | per litre 15 0 | Standard Nitrate Silver ..... | per litre 8 0 |
| Standard Ammonia ..... | " 5 0          | Standard Soap Test .....      | " 8 0         |
| Permanganate .....     | " 12 0         |                               |               |

### Dyeing Materials for Experiments.

|                       | <i>s. d.</i> |                       | <i>s. d.</i> |
|-----------------------|--------------|-----------------------|--------------|
| Annatto .....         | oz. 0 6      | Indigo, Spanish ..... | oz. 0 10     |
| Brazil wood .....     | lb. 1 0      | Logwood .....         | lb. 0 4      |
| Carmine .....         | oz. 4 0      | "    Extract .....    | oz. 0 3      |
| Cochineal .....       | " 0 3        | Madder .....          | lb. 1 0      |
| Cutch (Catechu) ..... | " 0 2        | Persian Berries ..... | oz. 0 3      |
| Cudbear .....         | " 0 3        | Safflower .....       | " 0 4        |
| Ebony Chips .....     | lb. 0 6      | Saffron .....         | " 4 0        |
| Fustic Chips .....    | " 0 6        | Shumac .....          | lb. 0 6      |
| Galls .....           | " 2 0        | Sanders, Red .....    | " 1 0        |
| Gamboge Gum .....     | oz. 0 8      | Turmeric Root .....   | " 0 6        |
| Garancine .....       | " 0 4        | "    " powder .....   | " 1 0        |

*Prices are subject to Market Variations.*

SPECIAL QUOTATIONS GIVEN FOR QUANTITIES.

## ACIDS.

### MINERAL ACIDS AND COMBUSTIBLE CHEMICALS.

As it is necessary to declare the above at the time of delivery, either to Carrier, Railway, or for Export, they cannot be packed with other Goods, but must be delivered at the Depots on certain days, according to the arrangements of the Railway Company by which they are to be forwarded.

The most convenient form for Acids is in stoppered Winchester Quarts, packed in cases containing either 4, 6, or 12 divisions.

Average weight of Winchester Quart Sulphuric Acid, 10 lb.

    "                    "                    "    Nitric Acid, 7½ lb.

    "                    "                    "    Hydrochloric Acid, 6½ lb.

## PURE STANDARD SOLUTIONS.

*Prepared by Messrs. F. Sutton & Co., Norwich.*

In best quality of stoppered bottles, free from Lead, and perfectly air-tight.

The exact working strength of each solution is noted on the label of each bottle.

### For the Titration of Acids, Alkalies, Alkaline Products, Soaps, &c.

|                                                                                                                                                                             | Per Litre<br>of 35 oz. in<br>1 bottle.<br>-/9. | Per 4<br>Litres in<br>2 bottles.<br>1/6. |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|------------------------------------------|
| Normal ( $\frac{N}{1}$ ), Seminormal ( $\frac{N}{2}$ ), or Decinormal ( $\frac{N}{10}$ ) Potash, Soda, or Ammonia, either as Caustic or Carbonate, c.c., dm., or septems .. | 5/ ..                                          | 16/                                      |
| $\frac{N}{1}$ $\frac{N}{2}$ $\frac{N}{10}$ Sulphuric, Nitric, Hydrochloric, or Oxalic Acid .. .. .                                                                          | 4/ ..                                          | 14/                                      |
| $\frac{N}{10}$ Caustic Baryta .. .. .                                                                                                                                       | 4/ ..                                          | 14/                                      |
| Standard Sulphuric Acid, 100 dm. or 1000 grn.=100 grn. Soda (Na <sub>2</sub> O) ..                                                                                          | 5/ ..                                          | 16/                                      |
| Normal Ammonio-Copper Solution for Acetic Acid, &c... .. .                                                                                                                  | 5/ ..                                          | 16/                                      |
| Standard Sulphuric, Nitric, or Hydrochloric Acid, 1 c.c. or dm.=0.01 gm. or 0.1 grn. NH <sub>3</sub> in gas liquor, &c. .. .. .                                             | 4/ ..                                          | 14/                                      |
| Standard Ammonia, 1 c.c. or dm.=0.1 gm. or .1 grn. NH <sub>3</sub> .. .. .                                                                                                  | 4/ ..                                          | 14/                                      |
| Saturated Solution of Pure Baric Hydrate .. .. .                                                                                                                            | 4/ ..                                          | 14/                                      |
| Standard Hydrate of Lime .. .. .                                                                                                                                            | 2/6 ..                                         | 8/                                       |

### For Miscellaneous Metals, Ores, Combined Acids, Salts, &c.

|                                                                       |       |     |
|-----------------------------------------------------------------------|-------|-----|
| $\frac{N}{10}$ Permanganate, Hyposulphite, or Bichromate .. .. .      | 5/ .. | 16/ |
| $\frac{N}{10}$ Iodine, Silver Nitrate, or Ammonic Thiocyanate .. .. . | 7/ .. | 25/ |
| $\frac{N}{10}$ Sodie Chloride, for Silver, &c. .. .. .                | 4/ .. | 14/ |
| $\frac{N}{10}$ Sodie Arsenite, for Chlorine and Bleach .. .. .        | 5/ .. | 16/ |
| Standard Copper Solution, for colour testing .. .. .                  | 4/ .. | 14/ |
| Standard Iron ditto .. .. .                                           | 4/ .. | 14/ |
| Standard Sodie Sulphide, for Copper, Zinc, Lead, &c. .. .. .          | 5/ .. | 16/ |
| Standard Pure Stannous Chloride (variable) .. .. .                    | 5/ .. | 16/ |
| Standard Iodide of Starch .. .. .                                     | 5/ .. | 16/ |
| Standard Potassic Iodide, for Mercury .. .. .                         | 5/ .. | 16/ |
| Standard Potassic Cyanide, for ditto .. .. .                          | 5/ .. | 16/ |
| $\frac{N}{10}$ Mercuric Chloride .. .. .                              | 4/ .. | 14/ |
| Standard Potassic Cyanide, for Copper .. .. .                         | 5/ .. | 16/ |
| Standard Copper Solution .. .. .                                      | 4/ .. | 14/ |
| Standard Salt for assaying Silver .. .. .                             | 4/ .. | 14/ |
| Standard Silver for ditto .. .. .                                     | 5/ .. | 16/ |
| Standard Salt for Photographic Baths .. .. .                          | 4/ .. | 14/ |
| Standard Silver for ditto .. .. .                                     | 5/ .. | 16/ |
| Standard Bichromate and Hyposulphite for Lead .. .. .                 | 4/ .. | 14/ |
| Standard Lead Solution .. .. .                                        | 4/ .. | 14/ |
| Standard Bichromate and Iron for Manganese .. .. .                    | 4/ .. | 14/ |
| Standard Ferrocyanide for Zinc .. .. .                                | 4/ .. | 14/ |



|                                                                         | Per Litre<br>of 35 oz. in<br>1 bottle.<br>-9 | Per 4<br>Litres in<br>2 bottles.<br>1/6 |
|-------------------------------------------------------------------------|----------------------------------------------|-----------------------------------------|
| Standard Zinc Solution .. .. .                                          | 4/                                           | 14/                                     |
| $\frac{x}{y}$ or $\frac{x}{y}$ Baric Chloride .. .. .                   | 4/                                           | 14/                                     |
| Standard Uranium Acetate, for Arsenic Acid .. .. .                      | 10/                                          | 35/                                     |
| Standard Uranium, for Bismuth .. .. .                                   | 12/                                          | 40/                                     |
| Standard Sodid Phosphate, for ditto .. .. .                             | 5/                                           | 16/                                     |
| Normal Baric Chloride, for $SO_3$ .. .. .                               | 4/                                           | 14/                                     |
| $\frac{x}{y}$ Potassic Bichromate, for ditto .. .. .                    | 4/                                           | 14/                                     |
| Standard Permanganate, for tannin .. .. .                               | 5/                                           | 16/                                     |
| Indigo Carmine, for ditto .. .. .                                       | 5/                                           | 16/                                     |
| Solution of Gelatine, for ditto .. .. .                                 | 5/                                           | 16/                                     |
| Standard Silver Nitrate, for Zinc Analysis .. .. .                      | 10/                                          | 35/                                     |
| Standard Ammonic Thiocyanate, for ditto .. .. .                         | 7/                                           | 25/                                     |
| Standard Copper Solution, for Sulpho-cyanides (Barnes' process) .. .. . | 5/                                           | 16/                                     |
| Solution of Sodid Bisulphite, for ditto .. .. .                         | 4/                                           | 14/                                     |

### Phosphoric Acid, Phosphates, Manures, &c.

|                                                                              |     |     |
|------------------------------------------------------------------------------|-----|-----|
| Standard Uranic Acetate or Nitrate, 1 c.c.=0.005 gm. or 0.05 gm. $P_2O_5$ .. | 10/ | 35/ |
| Ditto=0.01 gm. or 0.1 gm. Tricalcic Phosphate .. .. .                        | 10/ | 35/ |
| Standard Sodid or Ammonio-Sodid Phosphate .. .. .                            | 4/  | 14/ |
| Standard Calcic Phosphate .. .. .                                            | 5/  | 16/ |
| Acetic Solution of Sodid Acetate .. .. .                                     | 2/6 | 8/  |
| Standard Molybdic Solution, for Pemberton's process .. .. .                  | 10/ | 35/ |
| Molybdic Solution, for separation of $P_2O_5$ .. .. .                        | 10/ | 35/ |
| Strong Ammonic Nitrate Solution 75 % .. .. .                                 | 7/  | 25/ |
| Weaker ditto 10 % .. .. .                                                    | 4/  | 14/ |
| Magnesia Mixture for precipitating $P_2O_5$ .. .. .                          | 5/  | 16/ |
| Dilute Pure Sulphuric Acid 5 % .. .. .                                       | 2/6 | 8/  |
| Solution of Bismutic Nitrate for $P_2O_5$ .. .. .                            | 5/  | 16/ |
| Solution of Ammonio-Magnesian Citrate (Joulié) .. .. .                       | 6/  | 20/ |
| Solution of Ammonic Citrate sp. gr. 1.09 .. .. .                             | 5/  | 16/ |

### Sugar Analysis.

|                                                                   |     |     |     |
|-------------------------------------------------------------------|-----|-----|-----|
| Copper Solution (Fehling's process). In separate bottles, .. .. . | }   | 8/  | 25/ |
| mixed in equal proportions form Fehling Solution, .. .. .         |     |     |     |
| 1 c.c.=.005 gm. Sugar .. .. .                                     |     |     |     |
| Alkaline Tartrate from purest materials .. .. .                   |     |     |     |
| Knapp's Standard Mercuric Cyanide .. .. .                         | 10/ | 35/ |     |
| Sachsse's Standard Mercuric Iodide .. .. .                        | 10/ | 35/ |     |
| Dr. Pavy's Ammonio-Cupric Solution .. .. .                        | 5/  | 16/ |     |
| Concentrated Sub-acetate of Lead .. .. .                          | 7/  | 20/ |     |
| Pure Aluminic Hydrate, suspended in distilled water .. .. .       | 5/  | 16/ |     |
| Pure Acid Sulphate of Soda, for removing excess of Lead .. .. .   | 5/  | 16/ |     |

## Analysis of Urine.

|                                                           | Per Litre<br>of 35 oz. in<br>1 Bottle. | Per 4<br>Litres in<br>2 Bottles. |
|-----------------------------------------------------------|----------------------------------------|----------------------------------|
| $\frac{8}{10}$ Silver Nitrate, for Chloride .. .. .       | 7/                                     | 25/                              |
| $\frac{8}{10}$ Ammonic Thiocyanate ditto .. .. .          | 7/                                     | 25/                              |
| Standard Mercuric Nitrate (Liebig), for ditto .. .. .     | 7/                                     | 25/                              |
| Standard Mercuric Nitrate (Liebig), for Urea .. .. .      | 7/                                     | 25/                              |
| Baryta Solution for removing $P_2O_5$ and $SO_3$ .. .. .  | 5/                                     | 16/                              |
| Hypobromite Solution for Urea .. .. .                     | 7/                                     | 25/                              |
| Uranic Acetate or Nitrate for Phosphates .. .. .          | 10/                                    | 35/                              |
| Standard Phosphate Solution .. .. .                       | 5/                                     | 16/                              |
| Acetic Sodie Acetate Solution for ditto .. .. .           | 2/6                                    | 8/                               |
| Standard Barie Chloride for $SO_3$ .. .. .                | 4/                                     | 14/                              |
| Sodie Sulphate Solution for ditto .. .. .                 | 2/                                     | 6/                               |
| Fehling Solution in separate bottles, for Sugar .. .. .   | 8/                                     | 25/                              |
| Dr. Pavy's Concentrated Copper Solution for ditto .. .. . | 8/                                     | 25/                              |
| Ditto, mixed with Ammonia .. .. .                         | 5/                                     | 16/                              |
| Ferrocyanide Solution, for Albumen .. .. .                | 4/                                     | 14/                              |

## Volumetric Solutions of the British Pharmacopœia.

|                             |    |     |
|-----------------------------|----|-----|
| Potassic Bichromate .. .. . | 5/ | 16/ |
| Sodie Hyposulphite .. .. .  | 5/ | 16/ |
| Iodine .. .. .              | 7/ | 25/ |
| Silver Nitrate .. .. .      | 7/ | 25/ |
| Oxalic Acid .. .. .         | 5/ | 16/ |
| Caustic Soda .. .. .        | 5/ | 16/ |

## Analysis of Waters, Beers, &amp;c.

|                                                                              |     |     |
|------------------------------------------------------------------------------|-----|-----|
| Sensitive Nessler Test .. .. .                                               | 12/ | 40/ |
| Standard Ammonia Solution, 1, $\frac{1}{10}$ or $\frac{1}{100}$ mgm. .. .. . | 5/  | 16/ |
| Distilled Water, free from $NH_3$ and organic matter .. .. .                 | 2/  | 6/  |
| Solution of Pure Soda, for Nitrates by Aluminium 10 o/o .. .. .              | 5/  | 16/ |
| Standard Potassic or Sodie Nitrite .. .. .                                   | 6/  | 20/ |
| Standard Silver Nitrate for Cl (Frankland) .. .. .                           | 6/  | 20/ |
| Standard ditto 1 c.c.=1mgm. or 1 dm.=.01 grn. Cl .. .. .                     | 6/  | 20/ |
| Standard Water for hardness (Clark) .. .. .                                  | 6/  | 20/ |
| Standard Calcic Solution for Hardness (Frankland) .. .. .                    | 6/  | 20/ |
| Ditto (Wanklyn) .. .. .                                                      | 6/  | 20/ |
| Clark's Standard Soap Test .. .. .                                           | 8/  | 25/ |
| Wanklyn's Standard ditto .. .. .                                             | 8/  | 25/ |
| Tichborne's Standard ditto .. .. .                                           | 10/ | 35/ |
| Standard Potassic Nitrate, for Indigo process .. .. .                        | 5/  | 16/ |
| Standard Indigo Solution, from purest Indigotin .. .. .                      | 10/ | 35/ |
| Ditto weak ditto .. .. .                                                     | 6/  | 20/ |
| Standard Permanganate for Water (Oxygen process) .. .. .                     | 5/  | 16/ |
| Standard Hyposulphite, for ditto .. .. .                                     | 5/  | 16/ |
| Alkaline Permanganate, for Albumenoid $NH_3$ .. .. .                         | 10/ | 35/ |
| Standard Water of 8° hardness .. .. .                                        | 5/  | 16/ |
| Solution of Zinc Iodide, and Starch for Nitrites .. .. .                     | 5/  | 16/ |
| Standard Ammonia sp. gr. .9986 for acidity in Beer .. .. .                   | 2/6 | 7/6 |

*Half-litres of Standard Solutions are uniformly charged 6d. extra beyond the proportionate price per litre.*

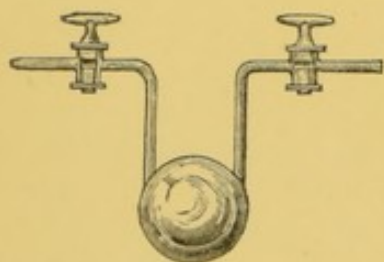


## Indicators.

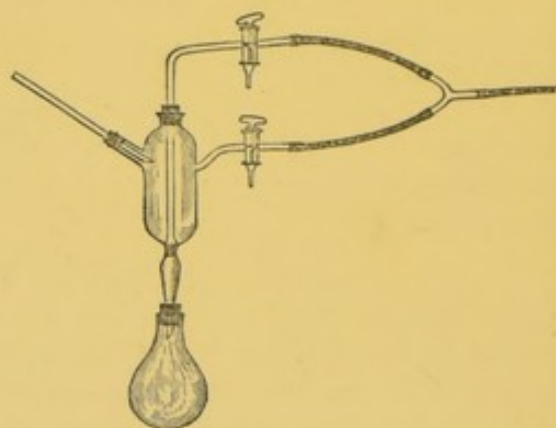
|                                      | Per 1 oz.<br>cork bot. 2d.<br>stopd. bot. 6d. | Per 5 oz.<br>crkd. bot. 2d.<br>stopd. bot. 6d. | Per 20 oz.<br>stopd. bot.<br>6d. |
|--------------------------------------|-----------------------------------------------|------------------------------------------------|----------------------------------|
| Ordinary Litmus Solution .. .. .     | 6d.                                           | 1/6                                            | 5/                               |
| Special Pure Litmus Solution .. .. . | 9d.                                           | 3/                                             | 10/                              |
| Ditto with Glycerine to keep .. .. . | 1/                                            | 4/                                             | 15/                              |
| Methyl Orange Solution .. .. .       | 9d.                                           | 3/                                             | 10/                              |
| Phenolphthalein Solution .. .. .     | 9d.                                           | 3/                                             | 10/                              |
| Phenacetolin Solution .. .. .        | 9d.                                           | 3/                                             | 13/                              |
| Eosin Solution .. .. .               | 6d.                                           | 2/                                             | 6/                               |
| Alcoholic Cochineal Solution .. .. . | 6d.                                           | 2/                                             | 7/6                              |

*The above Solutions are not kept in stock, but can be supplied at a few days' notice.*

## ADDENDA.



1589A



1600A

|                                                                    |     |   |      |
|--------------------------------------------------------------------|-----|---|------|
| 1589A Condensation Bulb, with 2 Stopcocks, for Sulphurous Acid ... | £0  | 4 | 0    |
| 1600A Fractional Distillation Apparatus, Lothar Meyer ...          | ... | 0 | 10 0 |

## TOWNSON &amp; MERCER'S

*Complete Illustrated Catalogue of Chemical Glass, Porcelain and Graduated Instruments, Air Pumps, Electrical, Galvanic, and Physical Apparatus. Royal 8vo, containing about 400 pages of Printed matter and 2000 Woodcuts.*

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AUGUST, 1888.

FLETCHER'S  
CHEMICAL  
GAS APPARATUS.

---

SOLD BY

TOWNSON & MERCER,

89, BISHOPSGATE STREET WITHIN,

LONDON.



# CLASSIFIED LIST OF BURNERS.

The following Classified List gives the gas consumption, approximate power in boiling water in quarts per hour, and general details of some of the ordinary stock patterns of burners. These are, by no means, all we make, but they are the ones most generally in demand. The use of the List will be at once seen in selecting any burner for any specified work by the number of quarts of water per hour which any burner will boil. This may be taken as an average, but the result will vary with different qualities of gas, and also with the shape, weight, and material of the vessels used.

|                                      | Quarts of water boiled per hour in a light copper vessel. | Price complete, with Stand. | Height with Stand.  | Width of support for vessels.       | See page of List No. 130. | Gas supply pipe required. | Price without support for vessels | Maximum gas consumption at 1 inch pressure. |
|--------------------------------------|-----------------------------------------------------------|-----------------------------|---------------------|-------------------------------------|---------------------------|---------------------------|-----------------------------------|---------------------------------------------|
| Argand Bunsen, $\frac{1}{2}$ in. ... | 3                                                         | 3/-                         | 3 $\frac{1}{2}$ in. | 5 in.                               | 47                        | 1 in.                     | 2/3                               | 3 ft.                                       |
| " " $\frac{3}{4}$ in. ...            | 7                                                         | 3/9                         | 4 in.               | 5 $\frac{1}{2}$ in.                 | 48                        | 1 in.                     | 2/9                               | 7 ft.                                       |
| Bunsen, $\frac{1}{2}$ in. ...        | 3                                                         | 2/-                         | 4 $\frac{1}{2}$ in. | 5 in.                               | 47                        | 1 in.                     | 6d.                               | 3 ft.                                       |
| " " $\frac{3}{4}$ in. ...            | 5                                                         | 2/2                         | 5 $\frac{1}{2}$ in. | 5 in.                               | 47                        | 1 in.                     | 7d.                               | 5 ft.                                       |
| " " $\frac{1}{2}$ in. ...            | 6                                                         | 2/6                         | 6 in.               | 5 in.                               | 47                        | 1 in.                     | 8d.                               | 6 ft.                                       |
| " " $\frac{3}{4}$ in. ...            | 8                                                         | 3/-                         | 7 in.               | 6 in.                               | 47                        | 1 in.                     | 10d.                              | 8 ft.                                       |
| " " $\frac{1}{2}$ in. ...            | 12                                                        | 4/-                         | 8 in.               | 6 in.                               | 47                        | 1 in.                     | 1/6                               | 12 ft.                                      |
| Safety Bunsen, $\frac{1}{2}$ in. ... | 5                                                         | 3/3                         | 4 $\frac{1}{2}$ in. | 5 in.                               | 46                        | 1 in.                     | 1/9                               | 5 ft.                                       |
| " " 1 in. ...                        | 10                                                        | 4/3                         | 5 $\frac{1}{2}$ in. | 5 in.                               | 46                        | 1 in.                     | 2/3                               | 10 ft.                                      |
| " " 1 $\frac{1}{2}$ in. ...          | 14                                                        | 5/9                         | 7 in.               | 6 in.                               | 46                        | 1 in.                     | 3/-                               | 14 ft.                                      |
| Safety Bunsen, Cluster of 4 ...      | 40                                                        |                             | 6 in.               | 6 in.                               | 46                        | 1 in.                     | 13/-                              | 40 ft.                                      |
| " " " 7 ...                          | 70                                                        |                             | 6 in.               | 6 in.                               | 46                        | 1 in.                     | 20/-                              | 70 ft.                                      |
| " " " 12 ...                         | 120                                                       |                             | 6 in.               | 6 in.                               | 46                        | 1 in.                     | 33/6                              | 120 ft.                                     |
| Low temperature... ..                | 7                                                         | 6/6                         | 7 in.               | 6 in.                               | 46                        | 1 in.                     |                                   | 7 ft.                                       |
| Duplex Radial, No. 7 ...             | 7                                                         | 1/9                         | 2 in.               | 5 $\frac{1}{2}$ in.                 | 40                        | 1 in.                     |                                   | 7 ft.                                       |
| " Star " 8 ...                       | 8                                                         | 1/9                         | 2 in.               | 5 $\frac{1}{2}$ in.                 | 40                        | 1 in.                     |                                   | 8 ft.                                       |
| " Radial " 9A ...                    | 9                                                         | 2/3                         | 3 in.               | 6 in.                               | 40                        | 1 in.                     |                                   | 9 ft.                                       |
| " Star " 10A ...                     | 10                                                        | 2/3                         | 3 in.               | 6 in.                               | 40                        | 1 in.                     |                                   | 10 ft.                                      |
| " Radial " 9 ...                     | 9                                                         | 3/-                         | 3 in.               | 6 in.                               | 40                        | 1 in.                     | 2/2                               | 9 ft.                                       |
| " Star " 10 ...                      | 10                                                        | 3/-                         | 3 in.               | 6 in.                               | 40                        | 1 in.                     | 2/2                               | 10 ft.                                      |
| " Radial " 11 ...                    | 11                                                        | 4/-                         | 4 in.               | 7 $\frac{1}{2}$ in.                 | 40                        | 1 in.                     | 3/-                               | 11 ft.                                      |
| " Star " 12 ...                      | 12                                                        | 4/-                         | 4 in.               | 7 $\frac{1}{2}$ in.                 | 40                        | 1 in.                     | 3/-                               | 12 ft.                                      |
| " Radial " 15 ...                    | 15                                                        | 5/-                         | 3 in.               | 10 in.                              | 40                        | 1 in.                     | 4/-                               | 15 ft.                                      |
| " Star " 16 ...                      | 16                                                        | 5/-                         | 3 in.               | 10 in.                              | 40                        | 1 in.                     | 4/-                               | 16 ft.                                      |
| " Radial " 23 ...                    | 23                                                        | 13/-                        | 3 in.               | 10 in.                              | 40                        | 1 in.                     | 8/8                               | 23 ft.                                      |
| " Star " 26 ...                      | 26                                                        | 13/-                        | 3 in.               | 10 in.                              | 40                        | 1 in.                     | 8/8                               | 26 ft.                                      |
| Hot Plate, No. 21 ...                | 21                                                        | 18/-                        | 3 in.               | 17 x 13 in.                         | 41                        | 1 in.                     |                                   | 21 ft.                                      |
| " " " 22 ...                         | 22                                                        | 18/-                        | 3 in.               | 17 x 13 in.                         | 41                        | 1 in.                     |                                   | 22 ft.                                      |
| " " " 49 ...                         | 49                                                        | 45/-                        | 4 in.               | 27 x 14 in.                         | 41                        | 1 in.                     |                                   | 49 ft.                                      |
| " " " 54 ...                         | 54                                                        | 45/-                        | 4 in.               | 27 x 14 in.                         | 41                        | 1 in.                     |                                   | 54 ft.                                      |
| 14S ...                              |                                                           | 3/-                         | 2 in.               | 3 $\frac{1}{2}$ x 9 in.             | 43                        | 1 in.                     |                                   | 18 ft.                                      |
| 10S ...                              |                                                           | 2/-                         | 2 in.               | 3 $\frac{1}{2}$ x 4 in.             | 43                        | 1 in.                     |                                   | 13 ft.                                      |
| Smoothing Iron Heater, 11S ...       |                                                           | 4/-                         | 5 in.               | 3 $\frac{1}{2}$ x 4 in.             | 31                        | 1 in.                     |                                   | 13 ft.                                      |
| 8S ...                               | 10                                                        | 1/9                         | 3 in.               | 5 $\frac{1}{2}$ in.                 | 41                        | 1 in.                     |                                   | 10 ft.                                      |
| 9S ...                               | 14                                                        | 2/3                         | 3 in.               | 6 in.                               | 41                        | 1 in.                     |                                   | 14 ft.                                      |
| Radial, 8R ...                       | 12                                                        | 2/-                         | 3 in.               | 6 in.                               | 42                        | 1 in.                     | 1/6                               | 12 ft.                                      |
| " SR ...                             | 12                                                        | 4/6                         | 3 in.               | 6 in.                               | 42                        | 1 in.                     | 3/-                               | 12 ft.                                      |
| " LR ...                             | 20                                                        | 6/6                         | 4 in.               | 7 $\frac{1}{2}$ in.                 | 42                        | 1 in.                     | 4/-                               | 20 ft.                                      |
| Star ...                             | 8                                                         |                             | 3 in.               | 4 in.                               | 44                        | 1 in.                     | 2/-                               | 8 ft.                                       |
| " " " 14 ...                         | 14                                                        |                             | 3 in.               | 4 in.                               | 44                        | 1 in.                     | 2/3                               | 14 ft.                                      |
| Star on Stand ...                    | 8                                                         | 3/-                         | 6 in.               |                                     | 44                        | 1 in.                     |                                   | 8 ft.                                       |
| Horizontal Star ...                  | 10                                                        |                             | 1 in.               |                                     | 51                        | 1 in.                     | 2/-                               | 10 ft.                                      |
| Concentric ...                       | 40                                                        | 28/-                        | 7 in.               | 12 in.                              | 43                        | 1 in.                     | 13/-                              | 40 ft.                                      |
| " " " 53 ...                         | 53                                                        |                             |                     |                                     | 50                        | 1 in.                     | 24/-                              | 53 ft.                                      |
| Solid Flame, No. 48 ...              | 12                                                        | 1/6                         | 3 $\frac{1}{2}$ in. | 5 in.                               | 45                        | 1 in.                     |                                   | 12 ft.                                      |
| " " " 47 ...                         | 25                                                        | 4/6                         | 4 in.               | 7 $\frac{1}{2}$ in.                 | 45                        | 1 in.                     | 3/6                               | 25 ft.                                      |
| " " " 47A ...                        | 12                                                        | 3/-                         | 3 $\frac{1}{2}$ in. | 6 in.                               | 45                        | 1 in.                     | 2/6                               | 12 ft.                                      |
| " " " 47B ...                        | 18                                                        | 3/9                         | 3 $\frac{1}{2}$ in. | 6 in.                               | 45                        | 1 in.                     | 3/-                               | 18 ft.                                      |
| Drip-proof Star ...                  | 14                                                        | 3/6                         | 3 in.               | 4 in.                               | 44                        | 1 in.                     |                                   | 14 ft.                                      |
| Drip-Proof High Power, }<br>No. 25 } | 25                                                        |                             |                     |                                     | 50                        | 1 in.                     | 5/6                               | 25 ft.                                      |
| " " " 40 ...                         | 40                                                        |                             |                     |                                     | 50                        | 1 in.                     | 11/-                              | 40 ft.                                      |
| " " " 60 ...                         | 60                                                        |                             |                     |                                     | 50                        | 1 in.                     | 18/-                              | 60 ft.                                      |
| " " " 90 ...                         | 90                                                        |                             |                     |                                     | 50                        | 1 in.                     | 25/-                              | 90 ft.                                      |
| " " " 200 ...                        | 200                                                       |                             |                     |                                     | 50                        | 1 in.                     | 45/-                              | 200 ft.                                     |
| High Power, No. 3 ...                | 25                                                        | 5/-                         | 4 in.               | 6 in.                               | 49                        | 1 in.                     | 2/6                               | 25 ft.                                      |
| " " " 4 ...                          | 40                                                        | 6/6                         | 5 in.               | 8 in.                               | 49                        | 1 in.                     | 5/6                               | 40 ft.                                      |
| " " " 6 ...                          | 90                                                        |                             | 4 in.               |                                     | 49                        | 1 in.                     | 12/6                              | 90 ft.                                      |
| " " " 8 ...                          | 200                                                       |                             | 6 in.               |                                     | 49                        | 1 in.                     | 26/-                              | 200 ft.                                     |
| Twin, No. 12 ...                     | 12                                                        | 7/6                         | 4 in.               | 13 $\frac{1}{2}$ x 6 $\frac{1}{2}$  | 38                        | 1 in.                     |                                   | 12 ft.                                      |
| " " " 18 ...                         | 18                                                        | 9/6                         | 4 in.               | 17 $\frac{1}{2}$ x 8                | 38                        | 1 in.                     |                                   | 18 ft.                                      |
| Twin Hot-plate, No. 24 ...           |                                                           | 22/-                        | 4 in.               | 15 x 13                             | 39                        | 1 in.                     |                                   |                                             |
| " " " 36 ...                         |                                                           | 27/6                        | 4 in.               | 18 $\frac{1}{2}$ x 17 $\frac{1}{2}$ | 39                        | 1 in.                     |                                   |                                             |
| " " " 42 ...                         |                                                           | 35/-                        | 4 in.               | 24 $\frac{1}{2}$ x 17 $\frac{1}{2}$ | 39                        | 1 in.                     |                                   |                                             |

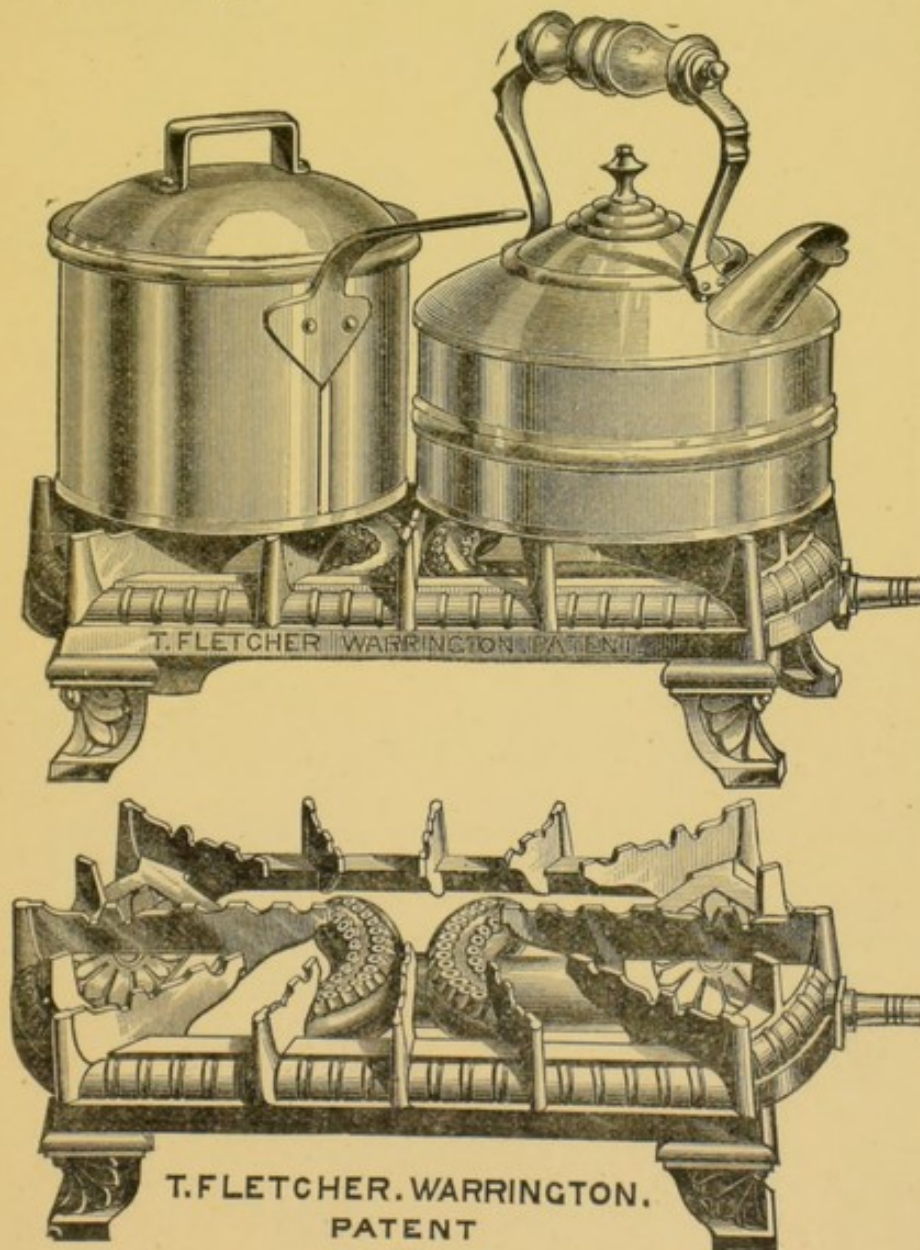


## TWIN BURNER,

These burners are a valuable improvement over any others for ordinary domestic use. One burner will with one gas supply boil **EITHER ONE OR TWO PANS AT ONCE**, without waste, and without the gas running up between and being half wasted, as it is when two pans are placed over an ordinary circular burner. The stands are made specially to carry one or two pans safely in any position. If one pan is placed over one end of one of the burners, it can be kept gently simmering, whilst all the remaining power is used for boiling the other pan.

Size No. 12 will boil one pan any size, or two not exceeding 8in. diameter, **Price 7/6.**

Size No. 18 will boil one pan any size, or two not exceeding 10in. diameter, **Price 9/6.**





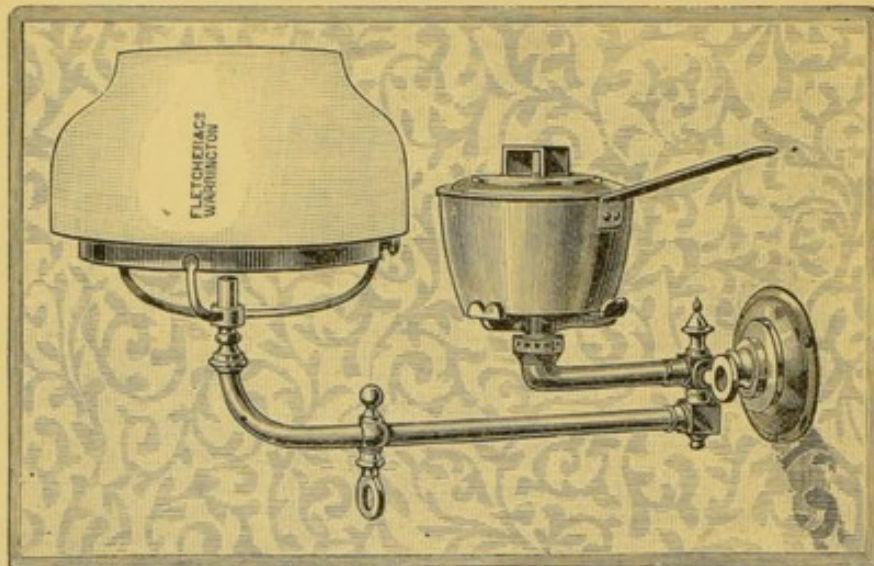
## COMBINED BRACKET for LIGHT AND BOILING PURPOSES.

FOR NURSERIES, BEDROOMS, SURGERIES, &c.

**Price**—Polished Brass or Steel Bronze, **17s.**

Globes and Holders and Pans extra to order.

\* Special Patterns in any style of decorative brasswork, for dentists' operating rooms, &c., to order. The boiling burner is a fixture, the light will swivel round on either side.



## Fletcher's Patent Twin Burner Hot Plates.

These will be found the most useful form of boiling arrangement ever devised. Each burner will boil either one or two pans at once, without waste of gas, giving an amount of convenience in use far greater than any other arrangement known. Gas inlet on left or right as ordered.

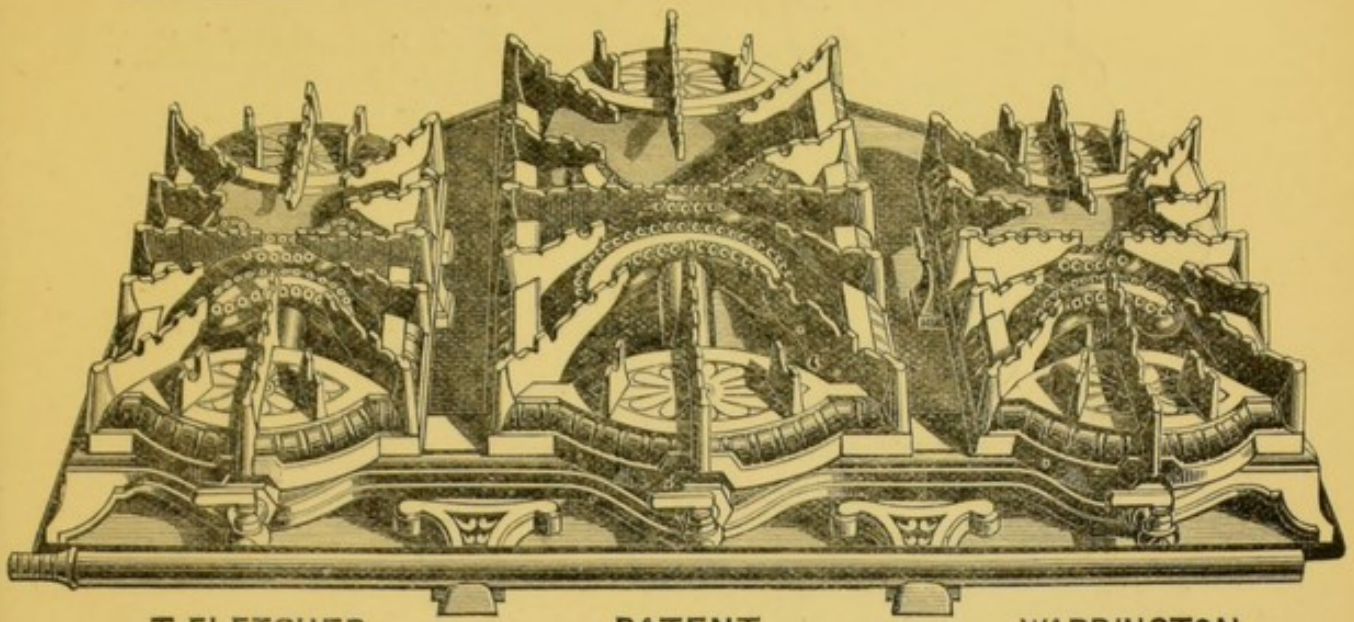
### TWO BURNER HOT PLATES.

To boil 1, 2, 3, or 4 pans at once.

**No. 24** with 2 No. 12 twin burners, **Price 22/-** Size over all 17½ by 16-in.

**No. 36** „ 2 No. 18 „ „ „ **27/6** „ „ 21 by 19-in.





T. FLETCHER.

PATENT

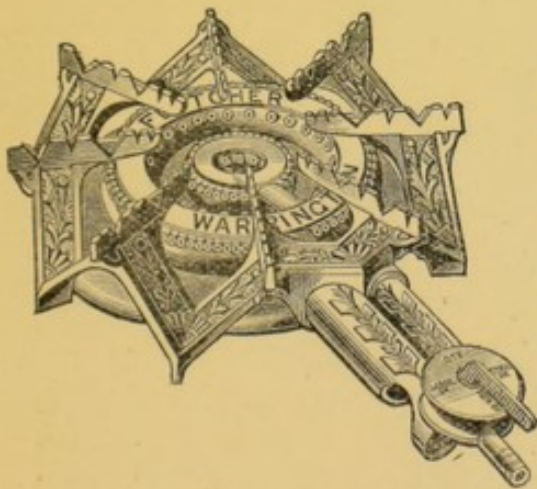
WARRINGTON.

### THREE BURNER HOT PLATE No. 42.

With two small and one large patent twin burners, to boil 1, 2, 3, 4, 5, or 6 pans at once. Size over all 28in. wide, 20-in. back to front. Price 35/-

### Patent \* Radial \* and Duplex Burners,

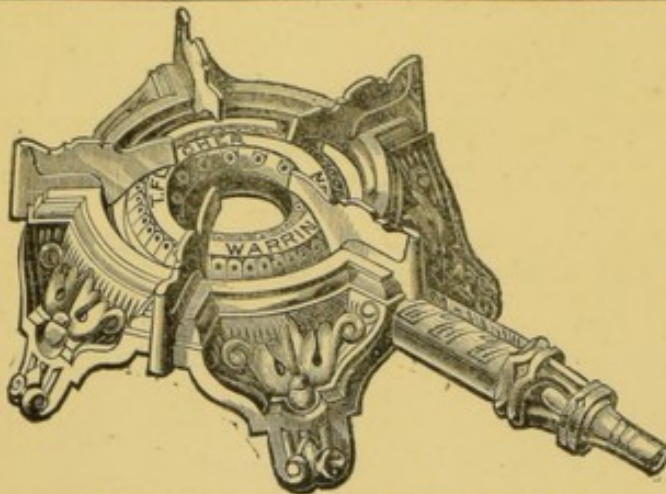
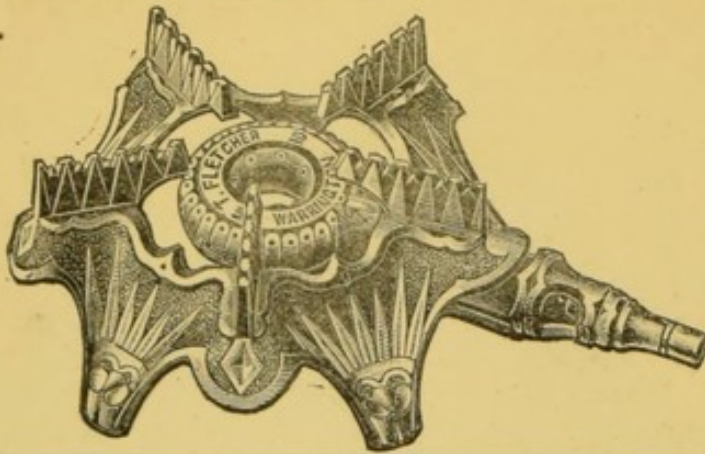
*A series of perfected high duty Gas Burners for all Heating Purposes.*



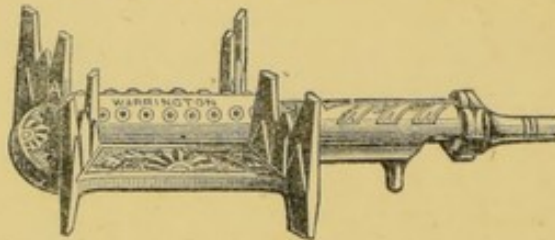
The series of Duplex Burners completes an entire range of Boiling Burners for all purposes. They are based, in constructive details, as closely as possible in accordance with the laws specified in my communication to the Gas Institute, and every care is taken that these burners shall, in every respect, be of the highest class. All sizes are made, both with the Patent Radial (slit) and also Star Flames, the price of both systems being the same for the same size. Like all my burners, the smaller

sizes are CAST IN ONE PIECE, as are all the sizes, so far as the burner is concerned, doing away with the clumsy and doubtful joints which are ordinarily used, and which are so fruitful a source of leakage and annoyance.





Nos. 10, 12, and 16. DUPLEX STAR.



Nos. 8 and 10A. DUPLEX STAR.

**THE NUMBER GIVES THE TOTAL GAS CONSUMPTION AT FULL POWER AT ORDINARY DAY PRESSURE ( $=\frac{1}{8}$ ) OF GAS.**

*The number of hot plate<sup>s</sup> and combined burners gives the total maximum gas consumption of all the burners in the apparatus added together. This number, divided by 3 or 4, depending on the quality of the gas, gives the number of gallons per hour the burner will boil in a light copper vessel.*

The support for vessels is unusually broad and steady, whilst it exposes the smallest possible quantity of metal to the action of the flame, thereby preventing waste of heat. Several patterns of stands are supplied in different styles with all sizes of these burners.

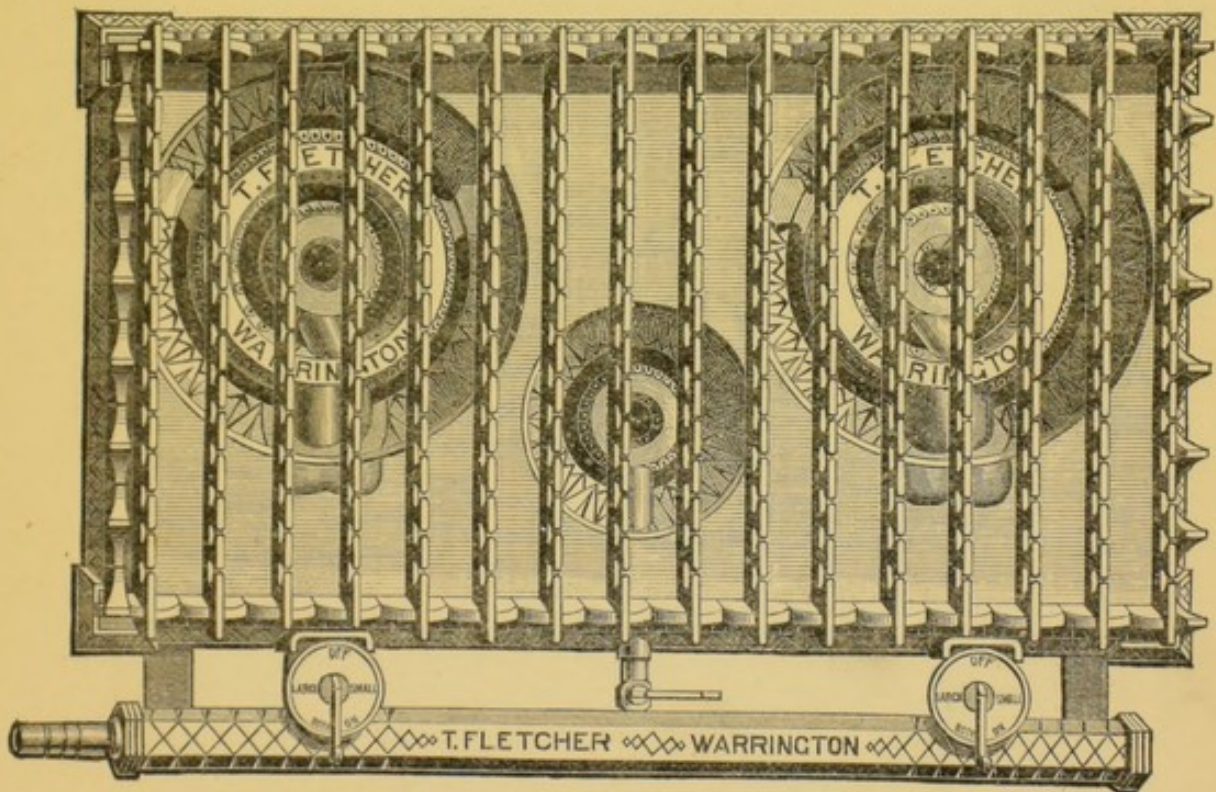
**PRICES :**

| No. |        | Width of support for vessels. | Height. | Price.  | No.                                           |        | Width of support vessels. | Height. | Price. |
|-----|--------|-------------------------------|---------|---------|-----------------------------------------------|--------|---------------------------|---------|--------|
| 7   | Radial | 5½ in.                        | 2½ in.  | 1s. 9d. | 12                                            | Star   | 7¾ in.                    | 4 in.   | 4s.    |
| 8   | Star   | 5½ in.                        | 2½ in.  | 1s. 9d. | 15                                            | Radial | 10 in.                    | 3½ in.  | 5s.    |
| 9a  | Radial | 6½ in.                        | 3½ in.  | 2s. 3d. | 16                                            | Star   | 10 in.                    | 3½ in.  | 5s.    |
| 10a | Star   | 6½ in.                        | 3½ in.  | 2s. 3d. | 23                                            | Radial | 10¾ in.                   | 3½ in.  | 13s.   |
| 9   | Radial | 6¾ in.                        | 3½ in.  | 3s.     | <i>2 concentric rings, with taps to each.</i> |        |                           |         |        |
| 10  | Star   | 6¾ in.                        | 3½ in.  | 3s.     | 26                                            | Star   | 10¾ in.                   | 3½ in.  | 13s.   |
| 11  | Radial | 7¾ in.                        | 4 in.   | 4s.     | <i>2 concentric rings, with taps to each.</i> |        |                           |         |        |



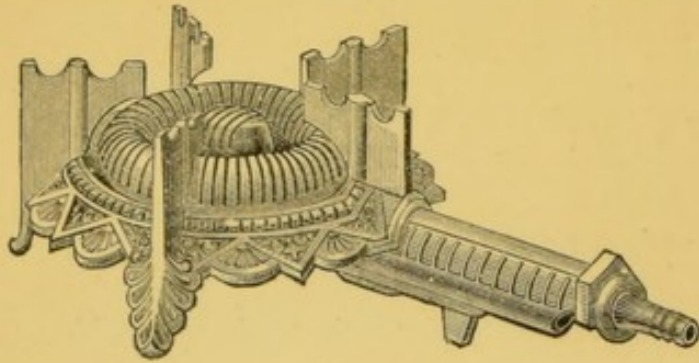
## HOT PLATES.

| No.       | Width of support for vessel. | Height. | Price |                                                                                                                |
|-----------|------------------------------|---------|-------|----------------------------------------------------------------------------------------------------------------|
| 21 Radial | 17×13                        | 3½ in.  | 18/-  | Hot plate, with 2 separate burners, with taps                                                                  |
| 22 Star   | 17×13                        | 3½ in.  | 18/-  | Hot plate, with 2 separate burners, with taps.                                                                 |
| 49 Radial | 27½×14½                      | 4 in.   | 45/-  | Hot plate, with 3 separate Radial burners, 2 being concentric, = 5 burners in all, with taps.                  |
| 54 Star   | 27½×14½                      | 4 in.   | 45/-  | Hot plate, with 3 separate Star burners, as engraved below, 2 being concentric, = 5 burners in all, with taps. |



No. 54. HOT PLATE. Nos. 49 and 54 will do the whole of the boiling, &c., in an average household, and will carry the largest pan, or a child's bath, for heating, if necessary. Gas supply from either side, as ordered.

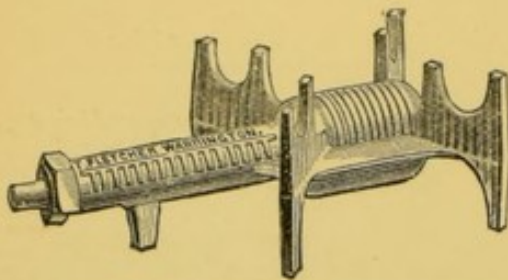


**SMALL SIZE.**

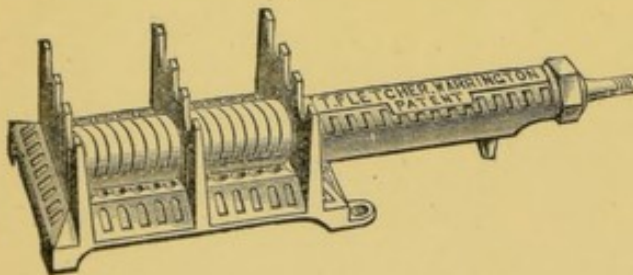
**S R**, Maximum consumption 12 ft. per hour, **4s. 6d.**

**LARGE SIZE.**

**L R**, Maximum consumption 20 ft. per hour, **6s. 6d.**



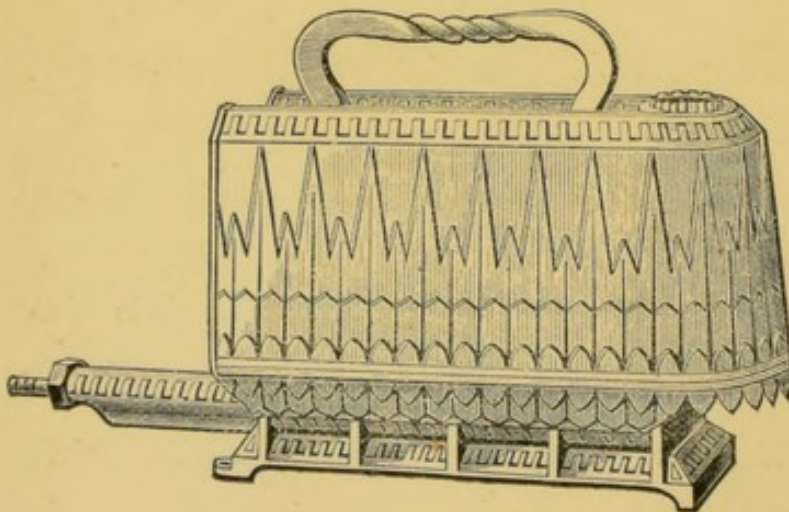
**No. 8 R., Price 2s.**—This is in one casting, practically indestructible, and will boil water in a light kettle at the rate of over 2 quarts in 12 minutes. Consumption 12 ft. per hour at full power.

**No. 10 S., Price 2s.**

Total length 12 inches.

Maximum consumption at  $\frac{1}{8}$  pressure, 13 cubic ft. per hour. For soldering irons, boiling, smoothing and hatters' irons, and general workshop use.

Polished plate for Hatters' velouring cloths 1s. 6d extra. The same burners in sets of 2 or 3, on cast-iron stand, with tap to each burner, **4s. 6d.** per burner.

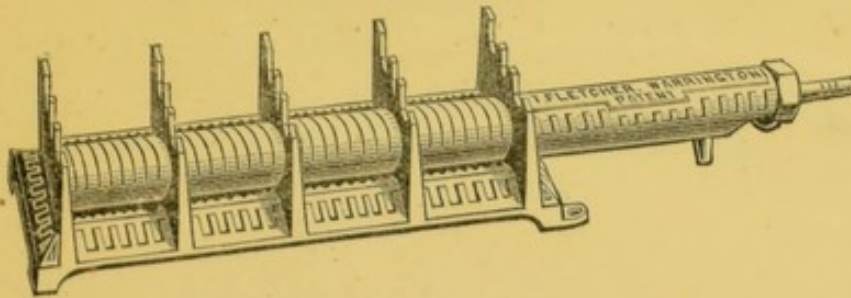
**13 S., Price 5s.**

This is the same burner as 10 S., fitted with cover for **Hatters' Irons.**

This is similar to 15 S., but a smaller size, to fit ordinary hatters' irons. Polished plates, to fit the same burner, for heating Velouring Cloths, 1s. 6d. each.

The same burners in sets of 2 or 3, on cast-iron stand, with tap to each burner, **7s. 6d.** per burner.

## HEATERS FOR TAILORS' IRONS.

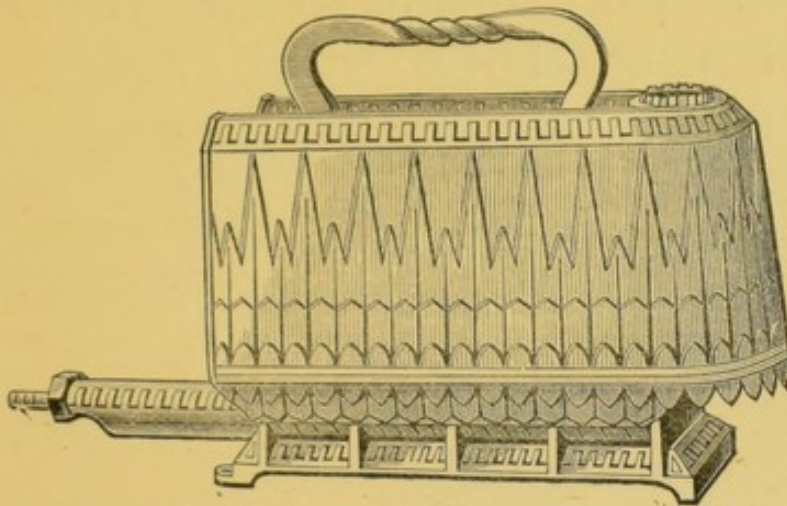


14 S.

Price 3s.

A similar burner to 10 S., but longer and more powerful. Specially designed for Tailors' Irons. Total length, 16½ in.

The same burners in sets of 2 or 3, on cast-iron stand, with tap to each burner, 7s. 6d. per burner.



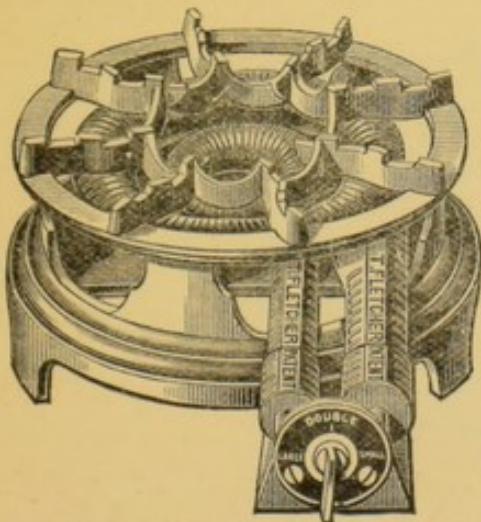
15 S.

Price 8s.

The same burner as 14S above, with cover to economise heat.

This will take a 28lb. tailor's iron, and heat it fully in 15 minutes.

The same burners in sets of 2 or 3, on cast-iron stand, with tap to each burner, 12s. per burner.



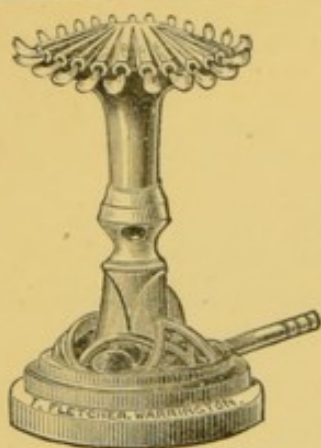
## PATENT CONCENTRIC BURNERS.

C. R. No. 1. Price 28s.

With separate gas supply to each Burner.

The larger circle burner is 9 inches diameter outside, and will burn, with day pressure, 30 cubic feet per hour at full power. The small circle will burn 10 cubic feet per hour, sufficient to keep a large stock-pot boiling.





## STAR BURNERS.

For glass flasks, vulcanizers, coffee urns, &c.

SMALL SIZE,  $3\frac{1}{2}$  in. high, will work steadily with any gas supply from 2 to 8 ft. per hour. **Price 2s.**

LARGE SIZE,  $3\frac{1}{2}$  in. high, 2 to 14 ft. per hour. **Price 2s. 3d.**

The same burner, mounted on a firm stand, with gas supply pipe, as engraved.

SMALL SIZE, 6 in. high. **Price 3s.**

## INDESTRUCTIBLE GAUZE FOR HIGH POWER AND OTHER BURNERS.

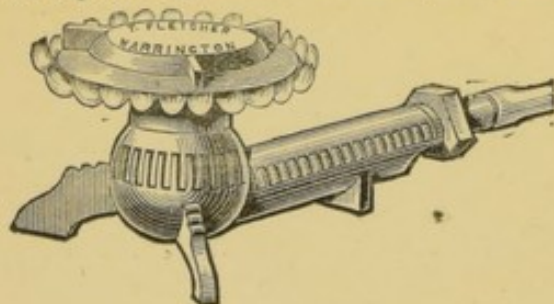
We are now prepared to supply Pure Metallic Nickle Gauze, practically infusible and indestructible, at the following charges:—

|                             | EACH GAUZE. |
|-----------------------------|-------------|
| No. 5, Safety Bunsen ... .. | 3d.         |
| No. 10 " " ... ..           | 4d.         |
| No. 14 " " ... ..           | 5d.         |
| No. 3, High Power ... ..    | 2/-         |
| No. 4 " " ... ..            | 3/-         |
| No. 6 " " ... ..            | 4/6         |
| No. 8 ... ..                | 8/-         |
| Low Temperature Burner ...  | 3/-         |

These will be found in every respect equal to pure Platinum Gauzes, at about one-tenth the cost. One Gauze will last on any burner for years in continual daily hard use in the dirtiest work.

## DRIP-PROOF STAR BURNER.

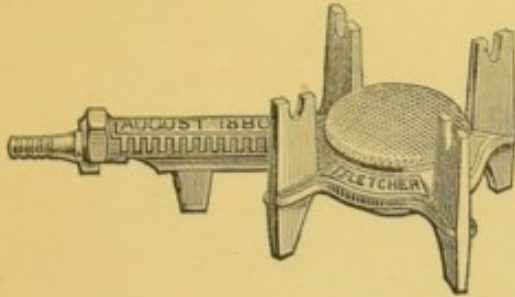
This is specially designed for wet, dirty work, such as glue pots, book-binders' tools, liquids liable to boil over, and places liable to drip. It will burn perfectly under a steady drip of water, and is not interfered with by falling dirt. Will burn steadily with any gas supply from 2 to 14 feet per hour at  $\frac{1}{8}$  pressure.



The burner will pass through an opening 3 in. high by  $4\frac{1}{2}$  in. wide **Price 3s. 6d.**

The same burner on upright stand, 6 in. high, **Price 3s. 3d.**

## Fletcher's Patent Solid Flame Boiling Burners.



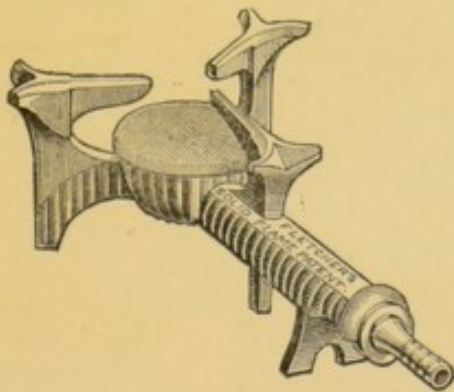
The statement as to the very unusual power of Fletcher's Patent Burners has been so repeatedly denied by those interested in the older forms, that the following tests, made without my knowledge, and published in the "Report of the British Association of Gas Managers, 1880," will set the matter finally at rest:—

"A Stove, fitted with Bunsen Burner formed by a ring of  $1\frac{1}{2}$ -in. iron pipe, with jet holes 1 inch apart, gave 244 units of heat for each cubic foot of gas."

"Fletcher's Patent Solid Flame Burner gave 450 units of heat for each cubic foot—nearly double the work—for the same cost."

**No. 48. Price 1s. 6d.**

Extra perforated tinned iron caps,  $2\frac{1}{2}$ d. each. Maximum gas consumption, 12 cub. ft. per hour at  $\frac{1}{8}$  pressure.



**No. 47. 25 ft. per hour, 4s. 6d.**

Extra nickel-plated caps, 1s. each.

**No. 47a. 12 ft. per hour, 3s.**

Extra nickel-plated caps, 6d. each.

**No. 47b. 18 ft. per hour, 3s. 9d.**

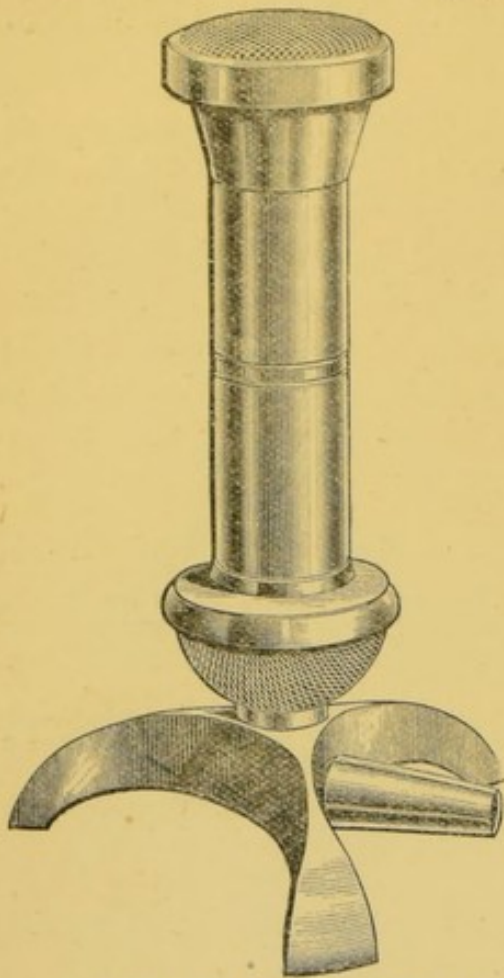
Extra nickel-plated caps, 9d. each.

The perforated caps of these burners must be kept clean, and must be pressed firmly down in their places, or they are liable to burn away at the edges.

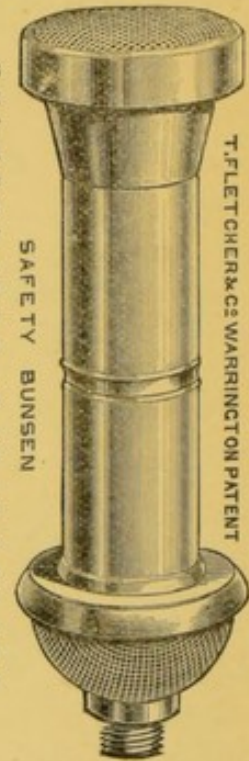
They will stand many years' regular use without damage.



## FLETCHER'S PATENT SAFETY BUNSEN. Improved Pattern.



These will be found as perfect as any upright tube burner can possibly be made, of the highest possible power for the size, can be turned down to the merest flicker without lighting back, and can be mounted on tubes in any form or number when very high powers are required. They are made in three sizes, all in brass, polished. The number gives the maximum gas consumption in cubic feet per hour at  $\frac{1}{8}$  pressure. These burners can be supplied in clusters of any number, or mounted on tubes, any shape, and with or without taps to order.



|                              |     |     |     |                    |                    |                    |
|------------------------------|-----|-----|-----|--------------------|--------------------|--------------------|
| Number                       | ... | ... | ... | 5                  | 10                 | 14                 |
| Diameter across top of gauze | ... | ... | ... | $\frac{1}{2}$ in.  | $1\frac{1}{2}$ in. | $1\frac{1}{2}$ in. |
| Height without stand         | ... | ... | ... | $3\frac{1}{2}$ in. | $4\frac{1}{2}$ in. | 6 in.              |
| Price, without stand         | ... | ... | ... | 1/9                | 2/3                | 3/-                |
| Price, on brass tripod stand | ... | ... | ... | 3/3                | 4/3                | 5/9                |

If placed a number together, on a tube or ring, they must be at least one-fourth the diameter of the top apart. The stand increases the total height about one inch.

SETS—No. 10 size. Each burning 10 cubic feet of gas per hour. Mounted in clusters of four burners (40 ft. per hour), 13/-; seven burners (70 ft. per hour), 20/-; twelve burners (120 ft. per hour), 33/6. Total height, 6 inches.

## LOW TEMPERATURE BURNER FOR LABORATORY USE.

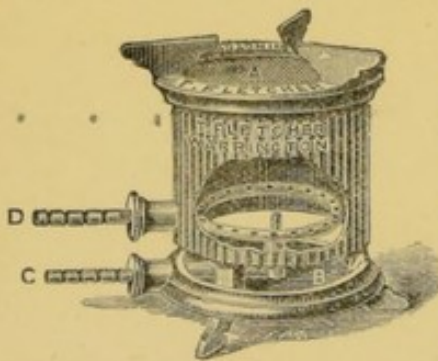


Fig. 7B.

Engraved one-fifth size.

having more than double the power, but they are not suited for very low temperatures.

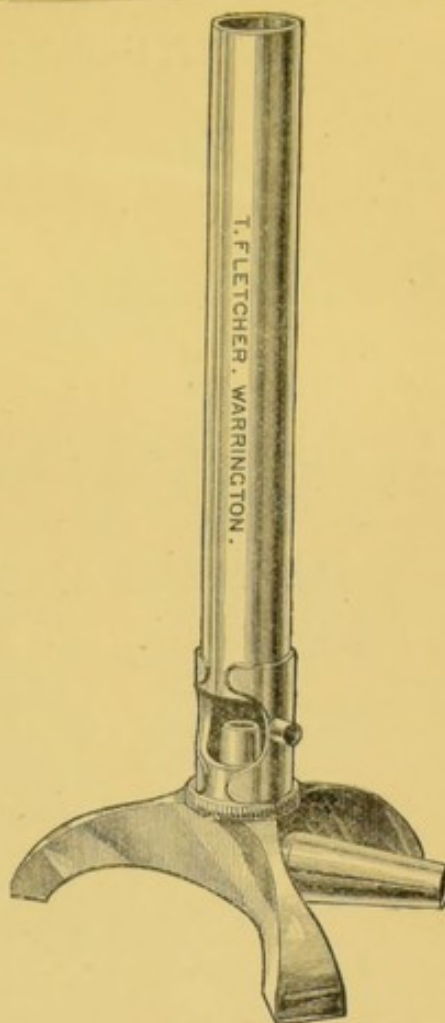
This burner gives a complete range of temperatures, from a gentle current of warm air to a clear red heat. It is equally well adapted for drying, evaporating, boiling, and general purposes. For very low temperatures the ring must be lighted through the opening B. For boiling, &c., the light must be applied on the surface of the gauze, thereby providing a body of blue flame, which can be urged by the blast pipe C. Price as Fig 7b., 7s. 6d., or without the blast pipe C. price 6s. 6d. Duplicate gauze tops, 4d. THIS IS ONE OF THE MOST GENERALLY USEFUL BURNERS, AND STANDS HARD DIRTY WORK WITHOUT INJURY. THE GAUZE, IF CHOKED UP WITH DIRT, CAN BE REPLACED IN A FEW SECONDS. The High Power or Radial Burners are better for quick heating or boiling purposes,

## FLETCHER'S BUNSEN.

These are the ordinary brass tube Bunsen. They are correctly proportioned in every detail, and of the full theoretical power, working up to their maximum calculated duty in every case. All are screwed for  $\frac{3}{8}$  connection.

The number gives the maximum gas consumption in cubic feet per hour at  $\frac{1}{10}$  pressure.

|                             |     |     |                    |                    |                   |                   |                   |
|-----------------------------|-----|-----|--------------------|--------------------|-------------------|-------------------|-------------------|
| Number                      | ... | ... | 3                  | 5                  | 6                 | 8                 | 12                |
| Size of tube outside        |     |     | $\frac{3}{8}$ in.  | $\frac{7}{16}$ in. | $\frac{1}{2}$ in. | $\frac{5}{8}$ in. | $\frac{3}{4}$ in. |
| Height without stand        | ... | ... | $3\frac{1}{2}$ in. | $4\frac{1}{4}$ in. | 5in.              | 6in.              | 7in.              |
| Price each without stand    | ... | ... | 6d.                | 7d.                | 8d.               | 10d.              | 1/6               |
| Price on brass tripod stand | ... | ... | 2/-                | 2/2                | 2/6               | 3/-               | 4/-               |

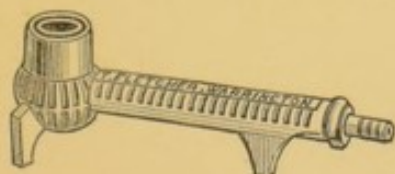


If fitted with tap, 1s. extra.

All have air slides; these enable the smaller sizes to be used with a blowpipe without the necessity of a loose internal tube.

Brass stands ONLY are supplied. The objectionable nature of iron stands on a laboratory table is too well known to need any remark. The stand increases the total height about 1 inch. They can be supplied in clusters of 3, 4, 7, or 12 burners, or mounted on tubes, in any form.

## FLETCHER'S ARGAND BUNSEN.



A cheap, simple, and indestructible Burner for small laboratory work.

The flame of these Burners is shorter, more compact, and higher in temperature than an ordinary Bunsen, and is also free from smell.

The air supply is self-adjusting.



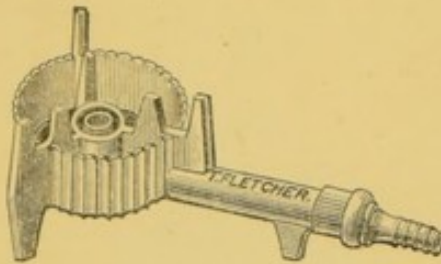
FLETCHER'S ARGAND BUNSEN—*continued.*

FIG 201.

The sizes given are the bore of the horizontal tube.

|                                                        | Price,<br>with tripod. | Price,<br>without tripod. |
|--------------------------------------------------------|------------------------|---------------------------|
| Gas consumption. Fig. 201.                             |                        |                           |
| $\frac{1}{2}$ in. size .. 3 $\frac{1}{2}$ ft. per hour | 3s.                    | 2s. 3d.                   |
| $\frac{3}{4}$ in. " .. 7 ft. "                         | 3s. 9d.                | 2s. 9d.                   |

All the above work perfectly with Air Gas or Coal Gas, but if the gas is rich, the tip of the brass gas jet may want knocking in a shade smaller. If made too small, the burner lights back.

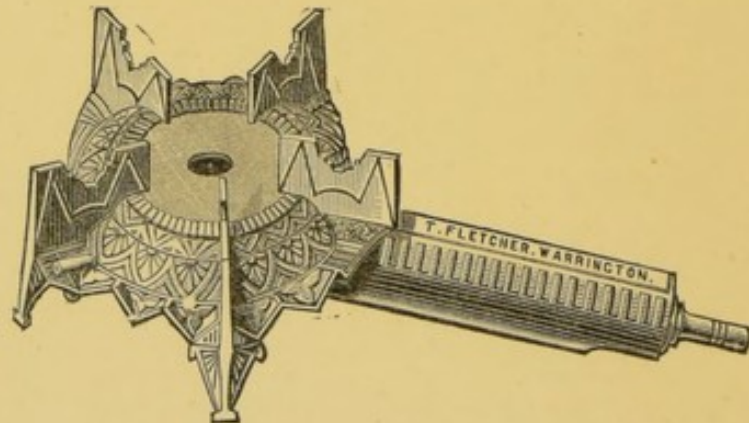
## FLETCHER'S SPECIAL HIGH POWER BURNERS.

The laws ruling the construction of heating burners, as given in my communication to the Gas Institute, and published in the Transactions for 1883, have been strictly adhered to in these burners, which, for their size, are unapproached in power by any burners in existence.

The new patterns are extra strong, and will carry large heavy vessels steadily with perfect safety.

On an average it may be taken that about three cubic feet of gas will boil one gallon of water in an ordinary vessel. The gas consumption of each size is given, and the power can, therefore, be readily calculated if required for any special work.

These Burners are the highest power for their size which it is possible to make, and embody in every detail the practical carrying out of



the laws of combustion of gases. The well-known Solid Flame Burners, which so many makers have done me the honour of copying, so far as they were able, are for their size about one-half the power of these Burners.

The 4 in. Burner, which is the one shown in the engraving above, will, with ordinary day pressure of gas, boil one gallon of water in a flat copper vessel in seven minutes, or ten to thirteen gallons per hour.

PRICES.

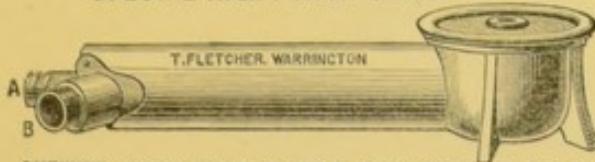
| SIZE ACROSS THE GAUZE SURFACE. | GAS CONSUMPTION IN CUBIC FEET. | PRICE WITH IRON GAUZE. | PRICE WITH PURE NICKEL GAUZE. | GAS PIPE REQUIRED.            |
|--------------------------------|--------------------------------|------------------------|-------------------------------|-------------------------------|
| 2 $\frac{3}{4}$ in. diameter.  | 25ft. per hour.                | 5/-                    | 7/-                           | $\frac{1}{2}$ in. clear bore. |
| 4 in. "                        | 40ft. "                        | 6/6                    | 9/6                           | $\frac{1}{2}$ in. "           |
| 6 in. "                        | 90ft. to 100ft. "              | 12/6                   | 17/-                          | $\frac{3}{4}$ in. "           |
| 8 in. "                        | 200ft. to 250ft. "             | 26/-                   | 34/-                          | 1 in. or 1 $\frac{1}{2}$ in.  |



The 6in. and 8in. sizes have no tripod or support for vessels, as the Burners are too small to carry the vessels they will heat. (See engraving.)



**SPECIAL HIGH POWER BURNER**



SHewing ATTACHMENT B WHEN USED WITH A BLAST OF AIR

An extra pattern of these burners is also made in all sizes to work with or without a blast of air. For working with ordinary gas pressure the gas must be connected to the jet A facing the centre of the tube. When a blast of air is used the air must be connected to this jet and the gas to the side nozzle.

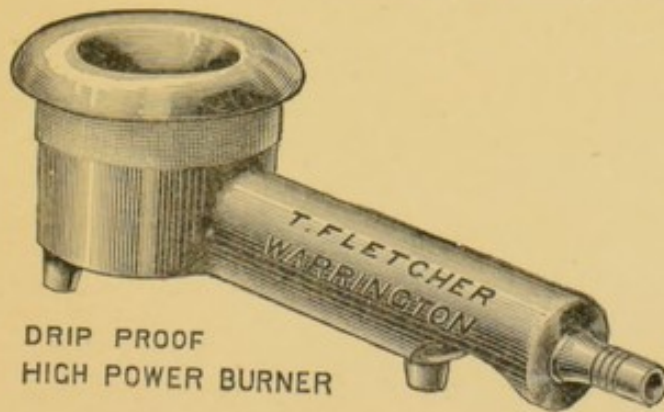
All the following are without tripod.

| Size of burner across gauze surface. | Gas consumption without blast at full power. | Gas main required without blast. | Gas consumption with blast at full power. | Gas main required with blast. | Price without blast arrangement. | Price of combined form to be used with or without blast | If with pure nickel gauze, extra. |
|--------------------------------------|----------------------------------------------|----------------------------------|-------------------------------------------|-------------------------------|----------------------------------|---------------------------------------------------------|-----------------------------------|
| in.                                  | ft. $\Psi$ hour.                             | in.                              | ft. $\Psi$ hour.                          | in.                           | s. d.                            | s. d.                                                   | s. d.                             |
| 2 $\frac{1}{2}$                      | 25 ...                                       | $\frac{1}{2}$ in.                | 180 ...                                   | 1                             | 2 6                              | 4 0                                                     | 2 0                               |
| 4                                    | 40 ...                                       | $\frac{3}{4}$ in.                | 280 ...                                   | 1 $\frac{1}{2}$               | 5 6                              | 8 0                                                     | 3 0                               |
| 6                                    | 90 ...                                       | 1 in.                            | 650 ...                                   | 2                             | 12 6                             | 20 0                                                    | 4 6                               |
| 8                                    | 200 ...                                      | 1 to 1 $\frac{1}{2}$ in.         | 1,400 ...                                 | 3                             | 26 0                             | 34 0                                                    | 8 0                               |

By enlarging the air jet the power may be increased very considerably, but in this case the burners cannot be used with the ordinary pressure of gas without a blast. The 6-inch high power burner will melt 1 cwt. of lead in 50 minutes without a blast, or with a blast of air the 4-inch burner will melt 1 cwt. in about 15 minutes.

**DRIP PROOF HIGH POWER BURNERS,**

With PURE SOLID NICKEL flame surfaces. These are undamaged by the dirtiest work, and will burn perfectly under a constant drip. The nickel flame surface adds considerably to the first cost of the burner, but it is practically everlasting, and will neither rust nor burn away.



**No. 25**, burning 25 cubic feet of gas per hour. This requires a  $\frac{1}{2}$  in. clear bore gas supply pipe. **Price 5s. 6d.**

**No. 40**, burning 40 cubic feet per hour. Requires a  $\frac{3}{4}$  in. bore gas pipe. **Price 11s.**

**No. 60**, burning 60 cubic feet per hour,  $\frac{3}{4}$  in. bore gas supply. **Price 18s.**

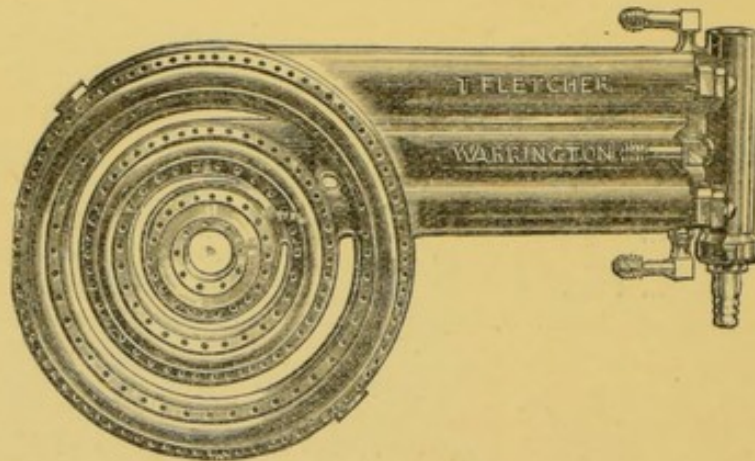


**No. 90**, burning 90 cubic feet per hour. Requires a  $\frac{3}{4}$ in. bore gas pipe. **Price 25s.**

**No. 200** burns 200 cubic feet per hour. Requires a 1-inch clear bore gas supply. **Price 45s.**

These burners are generally used under vessels either fixed or supported on wrought-iron stands. The burners themselves are very small in proportion to the power and the size of vessel they will heat. The bottom of the vessel should be about  $1\frac{1}{2}$  inches clear above the top of the burner.

## NEW TRIPLE CONCENTRIC BURNERS.



This is  $8\frac{1}{2}$ in. extreme diameter, and the three burners are in one single substantial casting. It has been designed, without consideration of cost, as the most powerful concentric ring burner which it is possible to produce, giving, at command, exact powers and exact sizes of flames.

Gas consumption at  $\frac{1}{8}$  pressure—

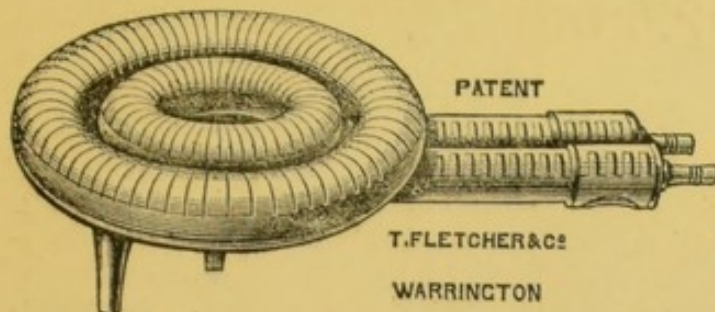
|             |       |    |                      |
|-------------|-------|----|----------------------|
| Centre ring | ..... | 9  | cubic feet per hour. |
| Middle „    | ..... | 20 | „ „                  |
| Outer „     | ..... | 24 | „ „                  |

The three combined, 53 cubic feet per hour.

Each ring will turn down to a double circle of minute specks of flame, will burn steadily and equally all round, and the flame is perfect and level under all conditions.

**Price**, as engraved, **24s.**

CONCENTRIC BURNERS—*continued.*



Radial slit, as engraved.

Height over all,  $3\frac{1}{2}$  in.

Inner ring,  $4\frac{1}{2}$  inches diameter, 10ft. per hour.

Price 5s.

Outer ring, 9 inches diameter, 30ft. per hour.

Price 8s.

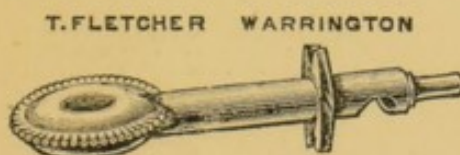
These burners are separate, but can be used together as engraved.



Wrought iron tube burners, straight or curved, any length and any power, without limit, with or without blast. If necessary, tube burners can be made with a perfectly equal and uniform flame, 15 feet long, or upwards.



**B 24.**—Pattern with separate jets. This is made in numerous lengths, up to 20 inches. The price of the 20 inch is 5s. Smaller sizes in proportion.



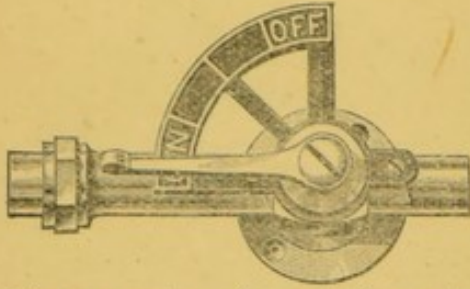
Horizontal Star, with central air way. This is in every respect the best star burner known. The faults peculiar to this class of burner are all completely remedied by the use of a horizontal tube. Diameter of

star  $3\frac{1}{4}$  inches, Total length 9 inches. Price 2s.

Longer pattern, total length  $11\frac{1}{2}$  inches. Same power. Price 2s. 3d. This size is also made with flat lugs. Either of these will burn steadily with  $1\frac{1}{2}$  to 10ft. per hour, giving a perfectly clear flame with any pressure of gas.



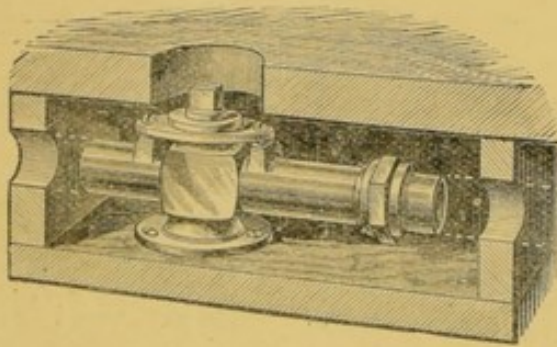
## SPECIAL TAPS FOR GAS HEATING APPLIANCES.



These taps have a full bore in the plug and barrel, are thoroughly well made and finished, and in case of repairs or cleaning can be taken apart from the front or upper side, so that they may be fixed in recesses or wall boxes without risk. Anything which can possibly happen to a tap can be made good without disturbing any joint, a matter of great importance when fixed in plaster or brick walls or under floors. The taps are of the finest workmanship throughout. All are made with screw union.

### QUADRANT TAPS WITH LEVER AND GRADUATED ARM.

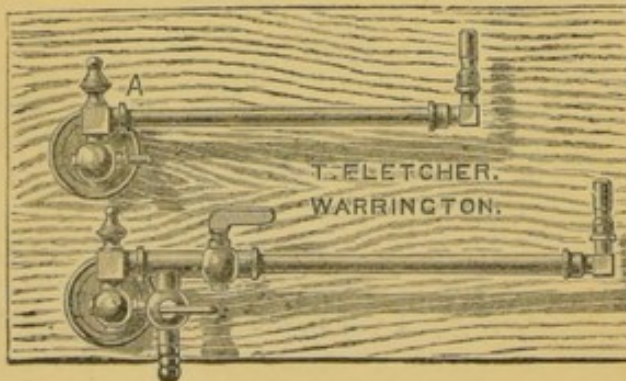
|           |                   |     |                   |     |                   |     |                   |     |      |
|-----------|-------------------|-----|-------------------|-----|-------------------|-----|-------------------|-----|------|
| Size ...  | $\frac{3}{8}$ in. | ... | $\frac{1}{2}$ in. | ... | $\frac{3}{4}$ in. | ... | $\frac{1}{2}$ in. | ... | 1in. |
| Price ... | 3/6               | ... | 4/6               | ... | 7/-               | ... | 8/-               | ... | 10/6 |



### TAPS WITH KEY FOR SETTING IN RECESSES OR UNDER FLOORS.

(AS ENGRAVED.)

Sizes and prices same as above. These taps are supplied with brass key complete.

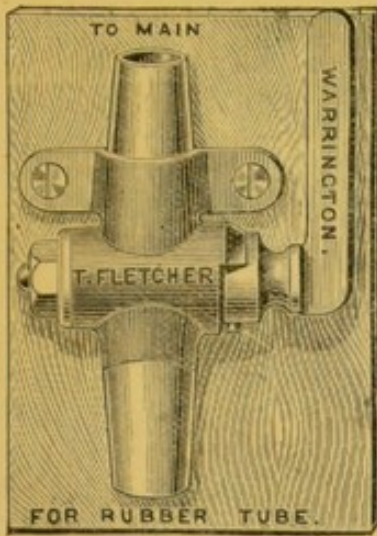


### GAS SUPPLY TAPS, SUITABLE FOR RUBBER TUBE, SCREWED JOINTS, or SOLDERING.

**Fig. 113**, to obtain a supply from an ordinary bracket. The engraving shows a bracket with and without the attachment.

Price of the attachment only:  $\frac{3}{8}$ in. size, 2/6;  $\frac{1}{2}$ in. 3/-





Main supply Tap, as engraved, but with unions.

For  $\frac{1}{2}$  inch pipe, 3s.

For  $\frac{3}{4}$  " " 5s.

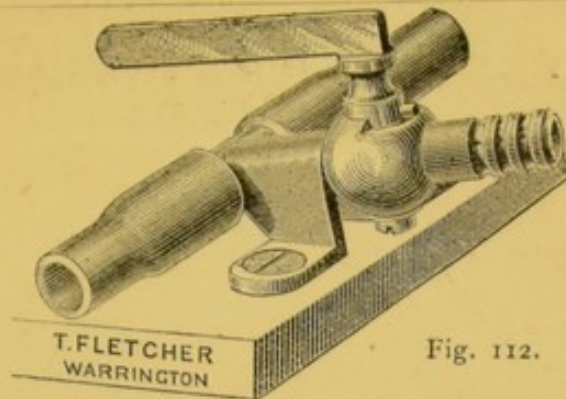


Fig. 112.

Fig. 112.

To obtain a side supply from the middle of a pipe.

$\frac{3}{8}$  in. size only, 2s.

| Screw.                      | Bore.             | Price. |
|-----------------------------|-------------------|--------|
| $\frac{3}{8}$ in. brass gas | $\frac{1}{4}$ in. | 1/-    |
| $\frac{1}{2}$ in. iron "    | $\frac{3}{8}$ in. | 1/4    |
| $\frac{5}{8}$ in. brass "   | $\frac{1}{2}$ in. | 2/-    |
| $\frac{1}{2}$ in. iron "    | $\frac{1}{2}$ in. | 2/4    |

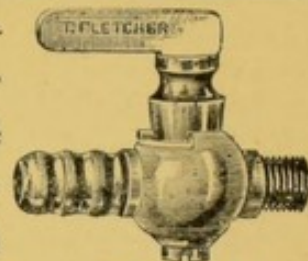
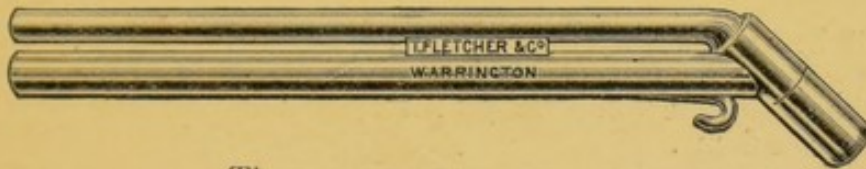


Fig. 114.

## FLETCHER'S NEW OXYGEN BLOWPIPE.

FOR USE WITH BRIN'S COMPRESSED OXYGEN.



These are made in three sizes.

**No. 7** requires about 7 cubic feet of oxygen per hour, and  $\frac{1}{4}$  in. gas supply, and will fuse a  $\frac{1}{4}$  in. wrought-iron rod easily. **Price 6s.**

**No. 20** requires about 20 cubic feet of oxygen per hour, and  $\frac{3}{8}$  in. gas supply, will fuse  $\frac{1}{2}$  in. wrought-iron rod, and will rapidly braze copper boilers and pipes  $\frac{1}{8}$  in. thick. **Price 8s.**

**No. 40** requires about 40 cubic feet of oxygen per hour, and  $\frac{1}{2}$  in. gas supply pipe, will fuse a clean hole in one minute through a  $\frac{1}{4}$  in. wrought-iron steam pipe  $\frac{1}{4}$  in. thick, and will braze work rapidly of considerably greater weight than this. **Price 10s.**

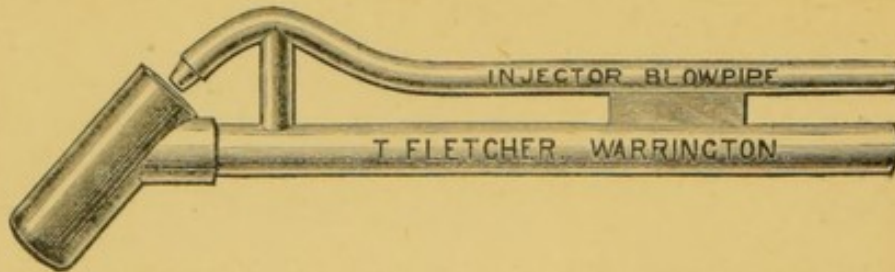
The compressed oxygen may be obtained from the Brin Oxygen Company, Horseferry Road, Westminster, London.

Repairs of Machinery in difficult positions can be done with a small bottle of oxygen and these blowpipes, with a small supply of ordinary coal gas, with the greatest ease.

**NOTE.**—These blowpipes are totally useless for coal gas and air; they are specially designed for use with compressed oxygen *only*.



## FLETCHER'S INJECTOR BLOWPIPE. FOR HEAVY BRAZING.



This is the most powerful blowpipe made which is light enough to use freely in the hand for difficult work of large size. The engraving shows the blowpipe one quarter full size, and at least a  $\frac{3}{4}$  in. clear bore gas pipe and tap are necessary to supply it at full power. With the smallest air jet and my **No. 5** Blower it will braze large copper sheets or cylinders,  $2\frac{1}{2}$  lbs. to square foot, rapidly and easily, and solid work of proportionate weight. With the largest air jet and small heavily weighted smith's bellows it will braze copper up to 2lb. square foot. Two blowpipes used on the same work will braze nearly double the weight of metal. The workman's hands are well away from the heat in doing large surface work.

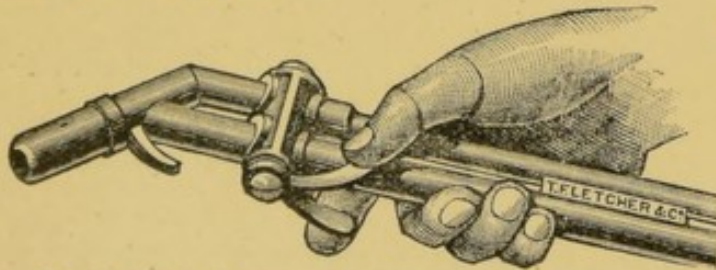
This is the only blowpipe made which can be used satisfactorily on large sheet work without the assistance of a coke fire. It is about double the power of the well-known pattern **8 C**.

Price, with two air jets, 12s.

## FLETCHER'S NEW AUTOMATIC BLOWPIPE

### Pattern C.

This will be found a simple and most extraordinarily efficient blowpipe for ordinary workshop use. Both gas and air are controlled with a movement of the finger, a few minutes' practice giving perfect mastery over the character of the flame.



**C 10.**—Small size, for fine light work, taking air jets not exceeding  $\frac{1}{8}$  in bore. **Price 9s.** The same Blowpipe on Stand, **12s. 6d.**

This requires Foot Blower No. 3 size.

**C 40.**—Medium size, for small workshop use, key brazing, copper gas pipe up to  $\frac{3}{4}$  in., &c., taking air jets not exceeding  $\frac{1}{4}$  in. bore. **Price 11s. 6d.** The same blowpipe on Stand, **17s. 6d.**

This requires Foot Blower No. 5 size, and  $\frac{1}{2}$  in. clear bore gas supply pipe.

**C 80.**—Large size, Injector pattern, will braze  $\frac{1}{2}$  in. thick flange on  $1\frac{1}{2}$  in. wrought-iron pipe, and copper cylinders up to 2 lbs. square foot. **Price 18s.**

This requires at least  $\frac{3}{4}$  in. clear bore gas supply, and Foot Blower No. 5 size.

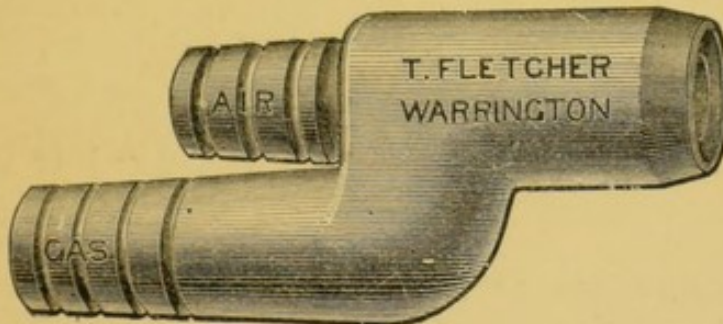
*The number gives approximately the gas consumption per hour at full power.*



## LARGE BLOWPIPES

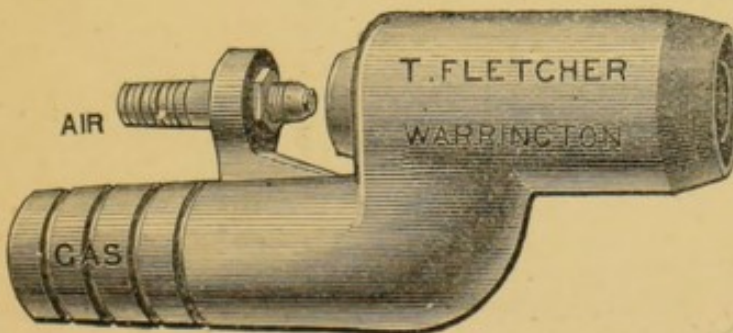
FOR BRAZING, REPAIRING MACHINERY, RETORT AND  
FURNACE HEATING, &c.

It has been found wasteful and unsatisfactory to use illuminating gas, whatever its quality, for large work, without a blast of air under pressure, owing to the difficulty and uncertainty of making a perfect mixture of air and gas—the usual result being a smoky and unsatisfactory flame of low temperature, giving a very low duty. The following Blow-pipes have been made to remove this difficulty, and they will be found exceedingly useful for repairs of pipes and joints, without the necessity of stopping or pulling machines to pieces.



No. 1.

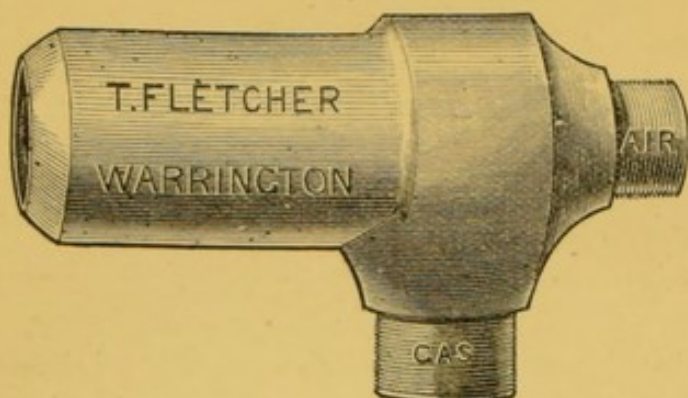
No. 1, Price 6s., requires a smith's bellows or good fan and a  $1\frac{1}{2}$  inch gas main. It will burn up to 300 cubic feet per hour, and will heat a 3 inch wrought-iron pipe to brazing heat in 5 to 6 minutes. If used under a boiler in series they can be placed side by side at the upper part of the flue, and each burner will give steam for about 4 H. P. indicated in an ordinary boiler.



No. 2.

No. 2, Price 9s., is the same power as No. 1, but can be used with our own foot blower No. 5, enabling it to be taken and used in positions where an ordinary smith's bellows would be a matter of great difficulty. With this a flaw in a pipe can be brazed in any position where it can be seen.



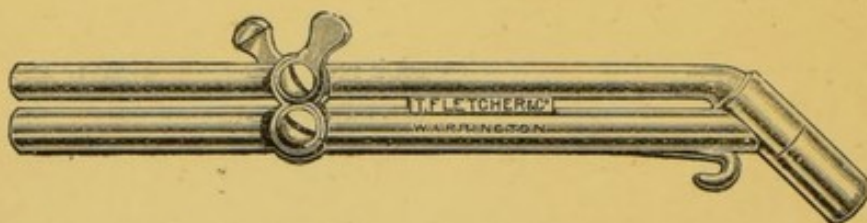


No. 3.

No. 3, Price 11s., is specially adapted for retorts and furnaces, the gas and air pipes being screwed respectively to 2 inch and 1½ inch iron gas thread for permanent couplings. The air jet in this is about double the area of the previous patterns, and with a good fan it has double the power of No. 1.

Gas is in many places now a waste product, which is difficult to utilize, and these blowpipes have been designed to meet a growing necessity.

*In reply to many enquiries, petroleum gas and producer gases, although satisfactory for furnaces, are very difficult to use in any open blowpipe for brazing and shop repairs.*



NEW PATTERNS OF **Fig. 8 C BLOWPIPE**, with improved control valve arrangement, gas and air supplies independent and under the control of one finger.

IMPROVED 8 C, SMALL SIZE. Price 8s. 6d.

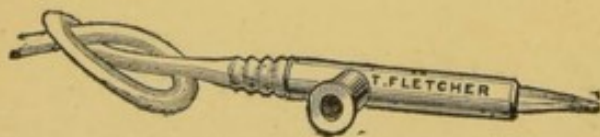
For jets not exceeding ¼ in. bore.

IMPROVED 8 C, LARGE SIZE. Price 10s. 6d.

This requires ½ in. gas supply, and will take jets up to ¼ in. bore. This will braze up to 1 in. wrought-iron pipe, if used with our Foot Blowers, No. 5 size.

The old pattern is not now supplied.

## FLETCHER'S UNIVERSAL BLOWPIPE.



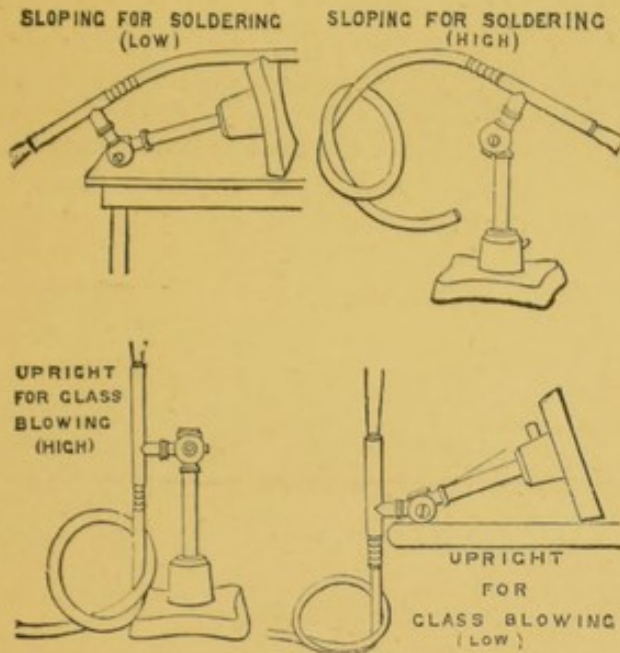
This, in its simplest form, consists of a "head" only, for screwing on a gas pipe, and can be used in any existing arrangement or bracket. The other forms shown are additions and attachments to this, for special purposes, but all

are interchangeable. The jets are the same as those used on the Automaton, the smallest pattern taking any jet not exceeding ¼ in. bore; the largest from ¼ in. to ¾ in.

UNIVERSAL BLOWPIPE—*continued.*

As will be seen, the same blowpipe not only takes a large range of jets, but admits of any and every adaptation which can possibly be required in any trade.

Universal Blowpipe "head" as engraved with one jet.  
**PRICES.** { **No. 3.—Price 4s. 6d.** Small size to fit  $\frac{3}{8}$  in. brass gas pipe.  
**No. 5.—Price 5s. 6d.** Large ,,  $\frac{1}{2}$  in. ,, "  
 (Extra jets 3d. each.)

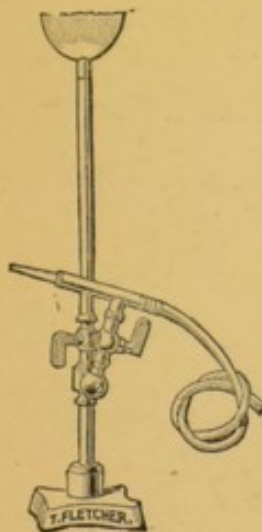


On stand with swivel joint. The engravings show the positions it can be used in for special purposes.

**No. 3.—Price 8s. 6d.**  
 Small size on stand (as engraved). The same, with tap for gas, **10s.**

**No. 5.—Price 12s. 6d.**  
 Large size (as engraved) on stand. This requires a  $\frac{1}{2}$  in. bore gas supply pipe.

JEWELLERS' AND DENTISTS' BLOWPIPES.



The same as above, with bench light and swivelling joint to blowpipe.

Small size only (No. 3), **Price 10s. 6d.**

Gas supply required for full power :—

Smallest size blowpipe  $\frac{3}{8}$  in. pipe

Large size blowpipe requires  $\frac{1}{2}$  in. clear bore pipe and tap.

If used with my own foot blowers, the smallest size requires No. 3 blower, the large size No. 5.

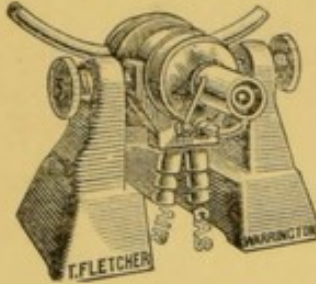
For sizes of Jets see page 375.



# FLETCHER'S COMPOUND BLOWPIPE.

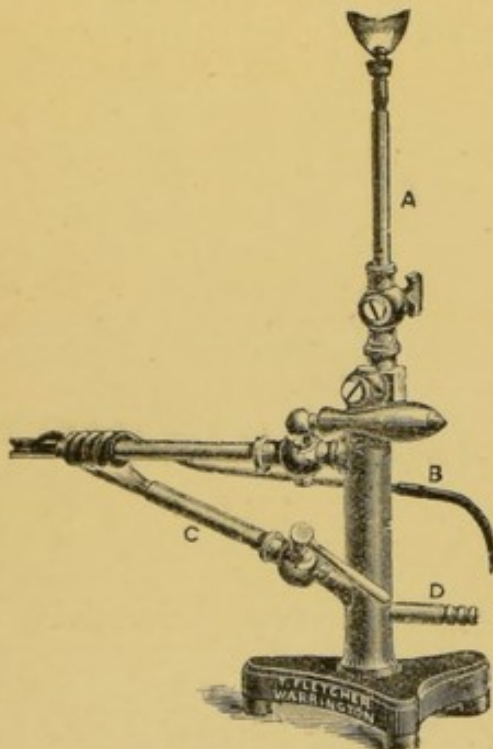
IMPROVED PATTERN.

**Price 60s.**



For Glass-workers, and Experimental Laboratories,  
(See "Shenstone's Method of Glass Blowing," Rivingtons.)

A double concentric blowpipe, the gas and air changing automatically from the larger to the smaller blowpipe by the slight movement of the lever at the back, the same movement also adjusting both gas and air to each other for each blowpipe, giving the fullest and most instantaneous control over the character and size of the flame, without necessitating the use of the hands.



*Engraved one-fifth full size.*

## IMPROVED FORM OF FLETCHER'S ORIGINAL HOT BLAST BLOWPIPE.

**Fig. 1 B, 12/6.**

For a large rough flame the Bunsen heater should not be used. The advantage of the hot blast shows only when a pointed flame is required having a high temperature.

Duplicate coils and jets, **1/6.**

Same pattern Hot Blast Blowpipe, only without the bench light, **10/6.**

### SIZES OF BLOWPIPE JETS.

|   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|
| 0 | 1 | 2 | 3 | 4 | 6 | 8 |
| • | • | • | • | • | • | • |



## FOOT BLOWERS.

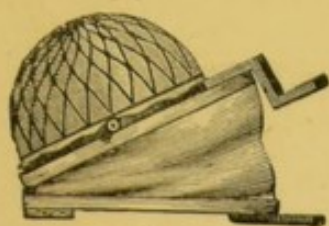


Fig. 9.

THESE ARE THE ONLY BLOWERS IN EXISTENCE GIVING ABSOLUTELY STEADY AIR PRESSURES IN ALL POSITIONS. No. 3 is the most usual size for blow-pipe work, and is generally used for autogenous soldering of lead chambers, being worked by the foot or under the arm as most convenient. No. 5 for the injector furnace, Fig. 41, and for large blowpipes. All patterns supply the air at a pressure of  $1\frac{1}{2}$  lb. on the square inch.

These blowers have proved themselves to be efficient, simple, strong, and able to stand hard and constant work. The pattern is now made in the following sizes:—

|                               | Size over all, including step and air pipe. | Pressure in inches in water. | Pressure in ounces. | Size of air pipes.           |
|-------------------------------|---------------------------------------------|------------------------------|---------------------|------------------------------|
| Fig. 9. Size No. 3—Price 21s. | $13 \times 10 \times 6\frac{1}{2}$ deep     | 30 in                        | 20 oz.              | on sq. in. $\frac{3}{8}$ in. |
| „ „ No. 5—Price 27s.          | $15 \times 12 \times 7$ deep                | 30 in                        | 20 oz.              | „ $\frac{1}{2}$ in.          |

(Diameter of Air Reservoir, No. 3, 8 inches; No. 5, 10 inches.)

### Fig. 9 B. Prices—No. 3, 25s. 6d.; No. 5, 35s.

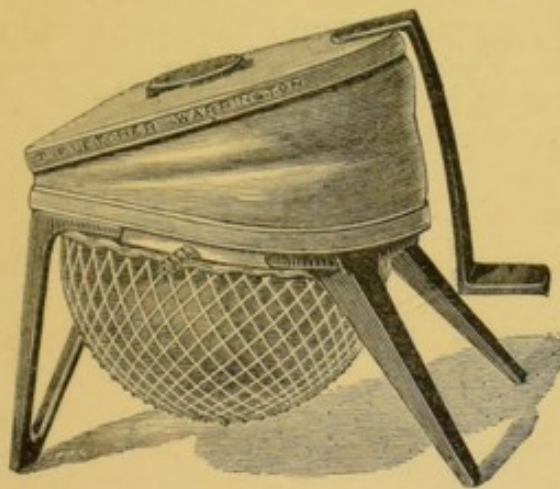


Fig. 9B.

This pattern, by reversing the position of the blower, reduces the risk of mechanical injury to the disc, and does away with the necessity for a wood casing or protection. It also prevents the valve from picking up dirt from the floor, keeping the whole arrangement cleaner, and the valves in more perfect order. Sizes as Fig. 9.

Extra Rubber Discs for No. 3, 2s. each; Nets, 1s. For No. 5, 3s.; Nets, 1s. 4d.

(2 rubber discs on each blower.)

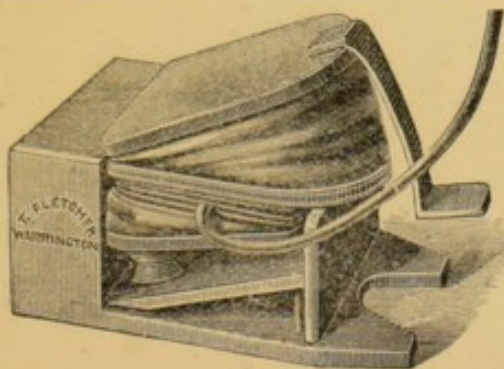


Fig. 9C.

### Fig. 9 C.

With spring reservoir in place of india-rubber disc. Fitted for the roughest general use, but not giving steady pressure. Sizes correspond with Fig. 9.

Price—

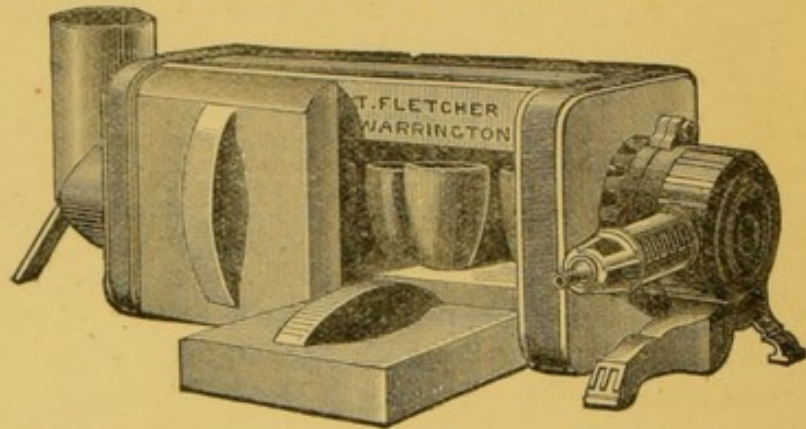
No. 3, 30s.; No. 5, 35s.

Unless for very rough usage, Fig. 9B is recommended in preference for all purposes.



## Fletcher's Reverberatory Gas Furnaces, FOR CRUCIBLES, MUFFLES, CUPELS, &c.

One of these furnaces will do most of the general work of an ordinary laboratory. They work perfectly with chimney draught to a bright red—about the fusing point of fine copper and fine silver. With a



blast they will work up to the fusing point of cast-iron. The furnaces can be made to take either two muffles at once, a number of crucibles, trays of cupels, or one muffle and crucibles or cupels at the same time.

The opening may be either at the side or the top, the furnace working either way equally well. The burner is at one end, out of the way of injury in case of accident to a crucible. Crucibles, cupels, &c., stand on the solid bottom of the furnace, perfectly steady and firm. When a blast burner is used a clay collar fits into the larger opening necessary for a draught burner, and the instructions for both draught and blast for the ordinary furnaces apply equally well to this, the burners being identical in principle with those of the previous patterns.

When used with the draught burner the blue cones of flame must be clearly seen on the burner, or if they disappear the gas supply must be increased, or the slide over the burner air tube closed until they reappear. In the latter case the furnace works with a smaller gas supply at a lower temperature, and by closing this slide and reducing the gas supply any temperature required can be obtained. If the adjustment of gas and air is neglected the burner grid becomes red hot and is quickly rendered useless. The grids will last for years if properly used.

| No.  | Floor Space in Furnace. |       |       | Price for Crucibles and Cupels. |                                                                                                                |
|------|-------------------------|-------|-------|---------------------------------|----------------------------------------------------------------------------------------------------------------|
|      | Long.                   | Wide. | High. |                                 |                                                                                                                |
| 1 H  | 14in.                   | 4in.  | 4in.  | 70/-                            | } Muffle Doors and Stoppers,<br>8s. each extra.<br>} Burner and Plug for Blast<br>arrangement, 10s. 6d. extra. |
| 23 H | 10in.                   | 5in.  | 5in.  | 70/-                            |                                                                                                                |
| 33 H | 14in.                   | 5in.  | 5in.  | 80/-                            |                                                                                                                |
| 6 H  | 14in.                   | 6in.  | 7½in. | 90/-                            |                                                                                                                |

1 H will take Five 2lb. crucibles at once, or 2 muffles about 4½in. wide × 3½in. long × 2¼in. high.

23 H will take Two 6lb. crucibles, or 2 muffles—3in. × 4in. × 3in.

33 H " Three " " " 4½in. × 4in. × 3in.

6 H " Two 12lb. " " 4½in. × 7in. × 4½in.

6 H requires a special burner when used for muffles or cupels—all the others work with the same burner for both purposes.

In ordering muffles, say if with slits for oxydising or plain for enamels and similar work.

| Muffle for |      | Clay. |     | Salamander. |     | Muffle for |     | Clay. |     | Salamander. |     |
|------------|------|-------|-----|-------------|-----|------------|-----|-------|-----|-------------|-----|
|            |      | 1/6   | 1/3 | 3/-         | 2/3 |            |     | 1/6   | 1/9 | 3/-         | 3/6 |
| 1 H        | ...  | 1/6   | ... | 3/-         |     | 33 H       | ... | 1/6   | ... | 3/-         |     |
| "          | 23 H | ...   | 1/3 | ...         | 2/3 | "          | 6 H | ...   | 1/9 | ...         | 3/6 |

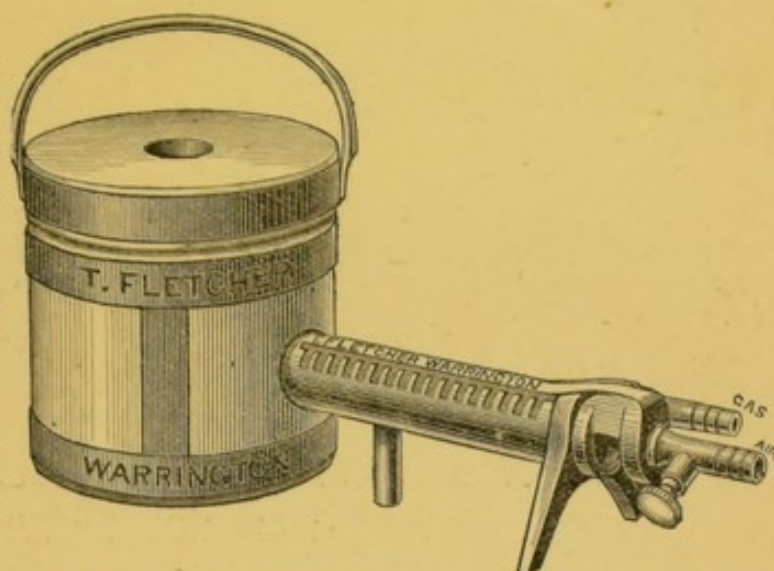


## FLETCHER'S PERFECTED INJECTOR FURNACE.

FOR METALLUR-  
GISTS, JEWEL-  
LERS, CHEMISTS,  
MANUFACTUR-  
ERS of ARTIFICIAL  
GEMS, and OTHER  
PURPOSES.

Works equally well  
with coal gas or air  
gas.

The small size can  
be used also with Ker-  
osine or Petroleum  
Oil. See page 380.



See tests made at the Exhibition of the Glasgow Philosophical Society, October 22nd, 1880.

**POWER AND SPEED OF WORKING.**—With  $\frac{1}{2}$  inch gas pipe, and the smallest foot blower, the smallest furnace will melt a crucible full of cast iron scrap in 7 minutes, tool steel in 12 minutes, and nickel in 22 minutes, starting with all cold. With a foot-blower No. 5, cast iron can be melted in any furnace up to the 12lb. size; tool steel or nickel in any up to the 6lb. size; Bessemer or gun steel in the smallest size. For higher powers or larger furnaces a Roots' blower, driven by power, is necessary, and the air jet must be enlarged to about double the size which can be used with a foot-blower.

### INSTRUCTIONS.

|                                          |   |                                         |
|------------------------------------------|---|-----------------------------------------|
| Gas supply required, 6 oz. size furnace, | 1 | in. pipe = 7 to 30 ft. of gas per hour. |
| " " " 2 lb. size "                       | " | in. pipe = 10 to 40 ft. "               |
| " " " 6 lb. size "                       | " | in. pipe = 25 to 60 ft. "               |
| " " " 12 lb. size "                      | " | in. pipe = 30 to 70 ft. "               |
| " " " 28 lb. size "                      | 1 | in. pipe = 100 to 300 ft. "             |

See that all gas taps have a large clear way through. High temperatures and rapid working require a free supply of gas.

To adjust a new furnace to its highest power for the gas supply available:—Put the nozzle of the burner tight up against the hole in the side of the casing, turn on the full gas supply, light the gas in the furnace, and commence blowing, *before* putting on the cover of furnace, with the air way full open. If when the cover is replaced the flame comes out of the hole in the cover about 2 inches, the adjustment is right. If the flame is longer, enlarge the hole in the air jet until the proper flame is obtained, or reduce the gas supply; if smaller, or not visible, screw in the air check until the flame appears.



**FOOT BLOWERS.** For a gas supply up to 40ft. per hour, blower No. 3 is sufficient: up to 75ft. per hour, blower No. 5. For the 28lb. Furnace, Roots' smallest blower, driven by power. (For blowers, see page 376.) Roots' Blower is made and supplied by Thwaites Bros., Engineers, Bradford, Yorks.

Keep all fluxes away from the furnace jacket.

Before stopping the burner draw the burner back from the hole. Commence blowing before the lid is put on the furnace.


The blower Fig. 9 is liable to pick up dirt from the floor, throwing it against the gauze of the burner, and stopping the proper working of the furnace until cleared away. A thin layer of silver sand on the bottom will prevent crucibles adhering when at a white or blue heat. Crucibles must be heated very slowly the first time they are used, unless of the "Salamander" brand.

All internally fired casings crack the first time they are used, but should not alter afterwards.

## Fletcher's Perfected Injector Furnace.

FOR DESCRIPTION SEE PREVIOUS PAGE.

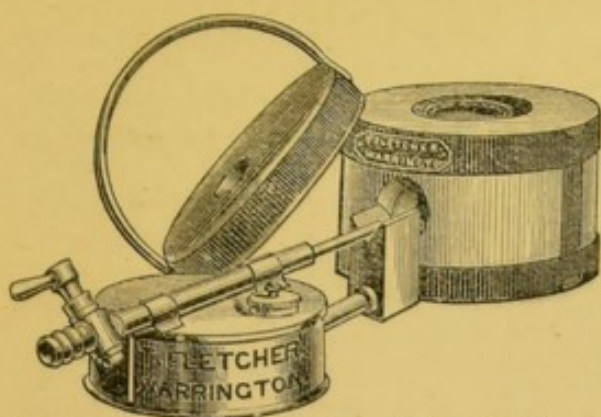
Prices for furnaces taking crucibles of the following sizes:—

| Crucibles No.— <br>(Morgan's.) | 00     | 1       | 3      | 6      | 14               |
|-------------------------------------------------------------------------------------------------------------------|--------|---------|--------|--------|------------------|
| Price of Furnace .....                                                                                            | 11/6   | 13/6    | 21/0   | 30/0   | 45/0             |
| Size of Crucibles in inches, outside<br>measure .....                                                             | 2 × 2½ | 2½ × 2¾ | 4 × 3½ | 6 × 4½ | 8 × 6½           |
| Capacity in lbs. iron .....                                                                                       | ½      | 2       | 6      | 12     | 28               |
| Foot Blower, Fig. 9b.....                                                                                         | 25/6   | 25/6    | 35/0   | 35/0   | Roots'<br>Blower |
| India-rubber Tubing .....                                                                                         | 3/0    | 3/0     | 4/0    | 4/0    |                  |
| Price, complete, ready for use, with<br>blower and tubing .....                                                   | 40/0   | 42/0    | 60/0   | 69/0   |                  |
| Extra Furnace Bodies .....                                                                                        | 3/6    | 4/6     | 8/6    | 14/0   | 20/0             |
| Extra Furnace Lids .....                                                                                          | 2/6    | 2/6     | 4/6    | 7/0    | 10/0             |
| Crucible Tongs .....                                                                                              | 1/6    | 1/6     | 2/0    | 2/0    |                  |
| Bow Tongs.....                                                                                                    |        |         | 3/0    | 4/0    |                  |
| Crucibles, Fireclay.....                                                                                          | /1½    | /2      | /5     | /10    | 2/4              |
| „ Salamander .....                                                                                                | /3     | /4      | 1/0    | 2/0    | 4/8              |

For the fusion of pure nickel over 6lbs. at once, a small Roots' blower, driven by power is necessary, and the air jets of the burners must be enlarged to double the size. The air supply of the 28lb. size must be controlled, if necessary, by a valve or large tap.



## OIL FURNACE.



When gas or benzoline is not obtainable, the No. 00 size furnace can be supplied to work with a lamp burning ordinary Kerosine or Petroleum oil. In using this, the wick holder of the lamp must be placed close against the hole in the furnace casing. It is *inferior in power* to the other arrangements, but with a little experience in management,  $\frac{1}{2}$  lb. of cast-iron can be fused in 12 minutes, starting all cold. **Price of furnace and lamp without blower and tubing, 14s. 6d.** Blower No. 3 is required.

## A SIMPLE FURNACE FOR HIGH TEMPERATURES.

(Working with either Gas or Spirit Petroleum, without alteration, and with perfect results with either Fuel.)

The Injector Gas Furnace is also supplied with a small, simple, and perfectly safe arrangement for burning the vapour of gasoline or benzoline, giving a power and efficiency fully equal to that which can be obtained by a large gas supply. The arrangement is in every way as simple as when gas is used, requiring no more trouble or attention. It equals a gas furnace in every respect, and in addition gives a heat of absolute purity, fitting it for the most delicate chemical operations where gas cannot be used owing to the presence of sulphur and other matters.

The ordinary pattern of Injector Furnace is used in precisely the same way as with gas, the only difference being that a branch pipe is taken out of the air supply and connected to the lower tap A on the generator, and a tube is carried from the upper tap B to the side tube of the Injector burner, marked "gas." The quantity of vapour required is adjusted by the lower tap A when the furnace is working, and the flame must be just visible at the hole in the lid, exactly as when gas is used, the instructions being precisely the same for both fuels. To charge the generator, pour benzoline or gasoline in the top hole until it overflows at the small tap C in the side, replace the cork firmly and close the overflow tap. It will then work for about ten to twelve hours at the full power of the Furnace.

Benzoline varies much in quality; it must, when a few drops are poured on a plate or the hand, evaporate quickly and completely, leaving no greasy stain, and if good will produce more vapour than the furnace can burn at its maximum power. All the tubing used must be perfectly smooth inside, or the power of the furnace is greatly reduced.



FURNACES—*continued.*

At the conclusion of an operation close both taps on the generator. It can then be left for any length of time ready for instant use. For ordinary meltings the generator can be used about thirty or forty times without refilling.

The No. 3 size will refine and perfectly fuse 6 lbs. of chemically pure nickel so that it can be poured clean, using an open crucible, a feat beyond the capabilities of any other known furnace.

Benzoline often contains heavy oils. If the generator works badly, empty it and refill with fresh.

PRICES.

Generator only for No. 00 or 1 Injector Furnace, capacity 2 lbs. metal, **27s. 6d.**

Generator for No. 3 or No. 6 Furnace, **40s.**

FURNACE, BLOWER, TUBING, AND GENERATOR, complete—

**No. 1 size**, capacity 2 lbs. metal, **80s.** **No. 3 size**, capacity 6 lbs. metal, **100s.** **No. 6 size**, capacity 12 lbs. metal, **110s.**

The engraving shows the No. 3 size Furnace, Generator and Blower, as when in use. Scale 1 inch to the foot. The foot-blower supplied with above is No. 5 (Fig. 9B, page 376). Not the one shown on engraving. The Generator No. 3 size, will work the 18 lb. furnace, provided gasoline is used. If benzoline or spirit petroleum is used, an extra size generator is necessary, **Price £3 10s.** This size furnace requires a Roots' blower, smallest pattern.

NOTE.—The generator is useless except with a supply of air under pressure. It cannot be used with draught furnaces. If used for blowpipes gasoline is necessary; benzoline or spirit petroleum is little, if any, use for any blowpipes. Gasoline is far inferior to coal gas for blowpipe use.

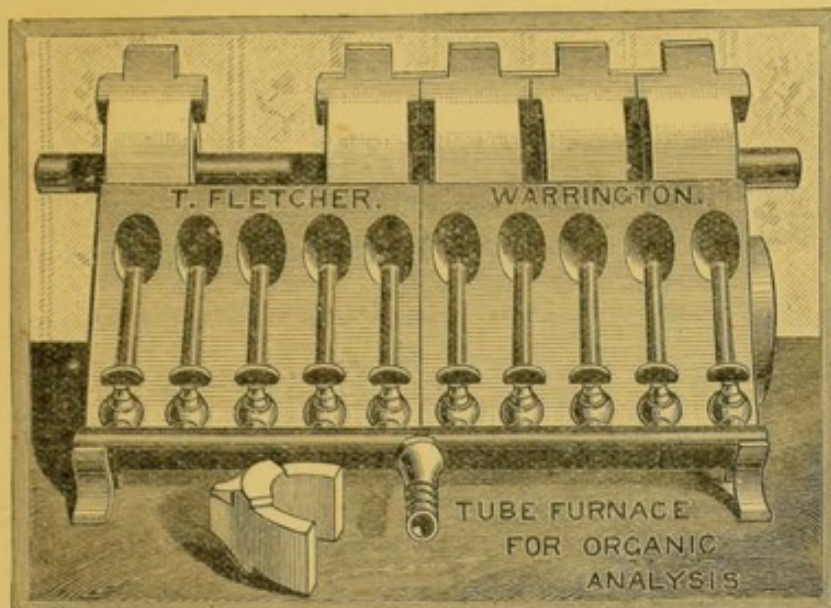
**GAS ENGINES**—The Generators can be used with perfect success for producing gas for engines. For details, see "English Mechanic," December 25th, 1885, Art. 25148, Page 342.



## FLETCHER'S TUBE FURNACE FOR ORGANIC ANALYSIS.

### No 2 PATTERN.

The special points about this furnace in which it differs from all others are, the burners are outside and in front of the furnace and clear from all falling dirt. There is no ironwork to rust, the whole of the metal used being brass.



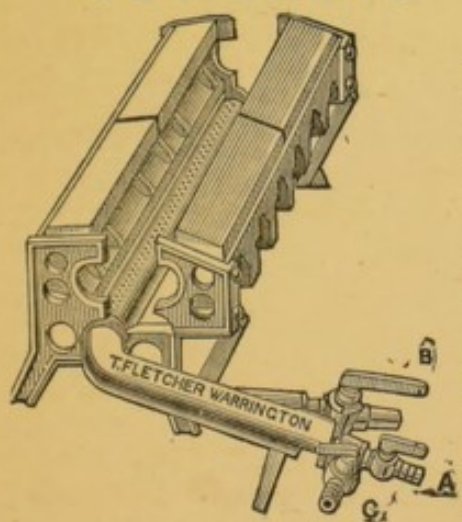
The furnace body is in 6-in. sections, and can be made up to any length without any obstruction, such as occurs when a long Hofmann furnace is used with a short tube.

The burners can be made any length, and any part of them used, the blocks and covers are sold separately, and the burners can be supplied in sections of 12, 24,

and 36 inches, so that any number can be used in a line without a break, enabling the furnace to be at once built up to any length required.

If a fixed length is required, any number of sections can be fixed permanently together. It is free from smell in use. In other respects it is similar to the ordinary Hofmann furnace.

## FLETCHER'S TUBE FURNACES.



The Engraving shows the Furnace open ready for the introduction of a tube.

This will heat an iron tube  $\frac{3}{4}$  to 1 inch diameter to its softening point in ten minutes, using a small foot-blower; or it will heat the same tube to redness without a blast, the same burner being applicable for either draught or blast.

To use as a Draught Furnace, connect the tap A with the gas supply, closing both the other taps.

As a Blast Furnace, connect B to a second gas supply full  $\frac{1}{2}$  inch bore, and connect C to a foot blower. When the blast is applied the tap A must be closed, and the gas supplied only from B. In the pattern with adjustable length of flame, at the side of A, is a screw plug which adjusts the area of the gas jet without affecting the pressure of gas. The gas supply when used without a foot-blower must be adjusted by this plug only,



FURNACES—*continued.*

and not with the tap, which must be full on. This plug adjusts the gas supply for varying lengths of flame, the length of the flame being altered by a sliding plug in the tube. On the end of the rod carrying the sliding plug is a tap which can be connected to an air supply for the purpose of cooling the part of the tube not exposed to the flame, preventing the heat spreading too rapidly by conduction.

The above can be used with air gas or coal gas.

## PRICES.

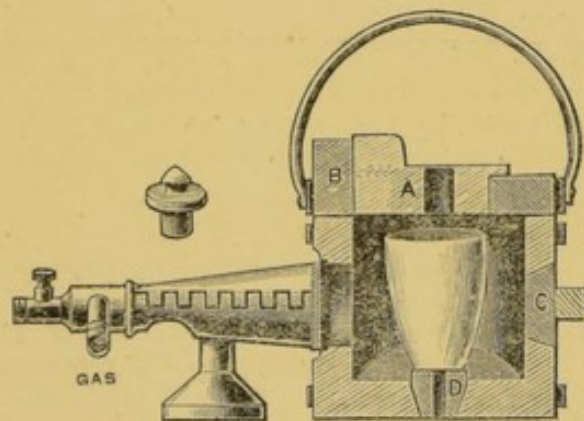
|                                                    | 12in.       | 18in.           | 24in.       |
|----------------------------------------------------|-------------|-----------------|-------------|
| For draught or blast, with adjustable flame length | <b>40s.</b> | <b>42s.</b>     | <b>50s.</b> |
| As above, without adjustable length of flame.....  | <b>35s.</b> | <b>37s. 6d.</b> | <b>40s.</b> |
| With fixed length of flame, without blast .....    | <b>25s.</b> | <b>30s.</b>     | <b>34s.</b> |

Extra non-conducting blocks, 6 inches long, 1s. 2d. each.

The Foot Blower No. 3, Fig. 9B, is the best for this furnace. Price **25s. 6d.**

## FLETCHER'S LECTURE & EXPERIMENTAL FURNACES,

**Price 37s. 6d.**



Working with the same burner as a draught or blast furnace at any temperature up to the fusion of the furnace casing, and adapted for Crucibles, Muffles, Tubes, Cupels, distillation by descension, treatment of refractory substances with gases at higher temperatures, small forgings, roasting ores, &c.

This furnace is specially designed for the lecture table, and has, I believe, power and capabilities equal to any demands which may be made on it. It must be remembered that, although the power of the burner is almost without limit, it is not possible at present to supply any furnace casing which will stand excessively high temperatures, or the contact of fluxes, without damage. Experiments are now being made with more refractory casings,

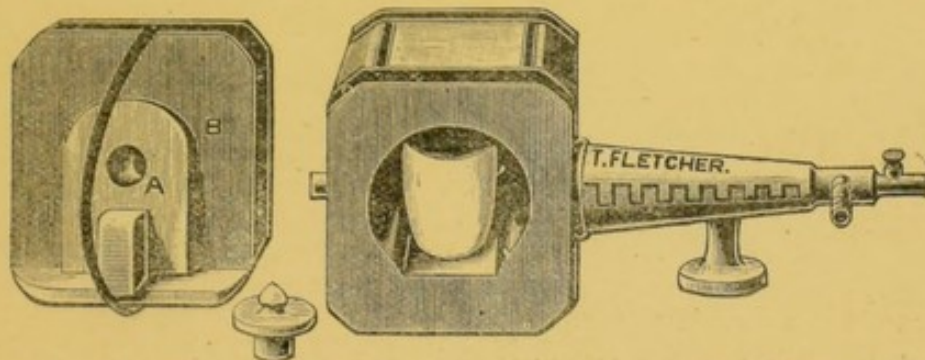


FURNACES—*continued.*

and if it is found possible to produce them commercially, arrangements will at once be made for their production. In the meantime, all parts of the casing will be supplied separately to make good any damage. Although not silent in use at the highest power, it is much less noisy than the Injector Furnace, and a lecturer with a good voice can be heard whilst it is working at full power.

**POWER.**—When used as a blast furnace, as shown in Fig. 1, an empty crucible,  $2\frac{1}{2} \times 2\frac{1}{4}$  inches, can be raised to the fusing point of cast iron in two minutes, starting all cold.

When the plug C (Fig. 1) is removed and replaced by the chimney, the blower being stopped, it will raise the crucible to bright redness in about ten minutes. This requires the gas to be turned very low, and the adjustment of the gas as a draught furnace requires some little practice to obtain the best results. If the gas is in excess it burns at the top of the chimney



instead of in the furnace, and, of course, does no work. The best results are obtained when the gas is connected to the straight jet, but it will work as a draught furnace fairly well if the gas is connected at the side jet in the same way as when used for blast, but, of course, with a much smaller supply of gas.

By turning the casing on its side, as shown in Fig. 3, the contents may be seen by a class whilst the furnace is working, and it can in this position be used for crucibles, muffles, combustion tubes, cupels, or roasting; and with either draught or blast according to the temperature required.

The plug D is perforated for distillations by descension, and when removed will admit of a one-inch combustion tube being passed through the furnace. When used with blast the instructions for the Injector Furnace must be followed, the only difference being that the Lecture Furnace is more silent, and about twice as quick in working. The crucibles are Morgan's Patent No. O size, and larger sizes must not be used.

**NOTE.**—When used with a blast and the air is in excess, the burner is liable to scream. If it does so, it is a sign that the gas supply is deficient for the blast used. When the lid is lifted, close the revolving burner slide. The price does not include crucible tongs.

Extra Muffles, fireclay, **9d.** Salamander, **1s. 6d.**



FURNACES—*continued.***FLETCHER'S GAS OR PETROLEUM FORGE.**

*As used at Woolwich Arsenal.*

This simple arrangement is the only system by which steel tools can be forged without injury by the use of gas. It will be found a perfect arrangement for small odd forgings. It is perfectly clean, no nuisance either in lighting or use, and is always ready for instant use. Starting all cold, a slide rest tool can be repaired or shaped in two minutes.

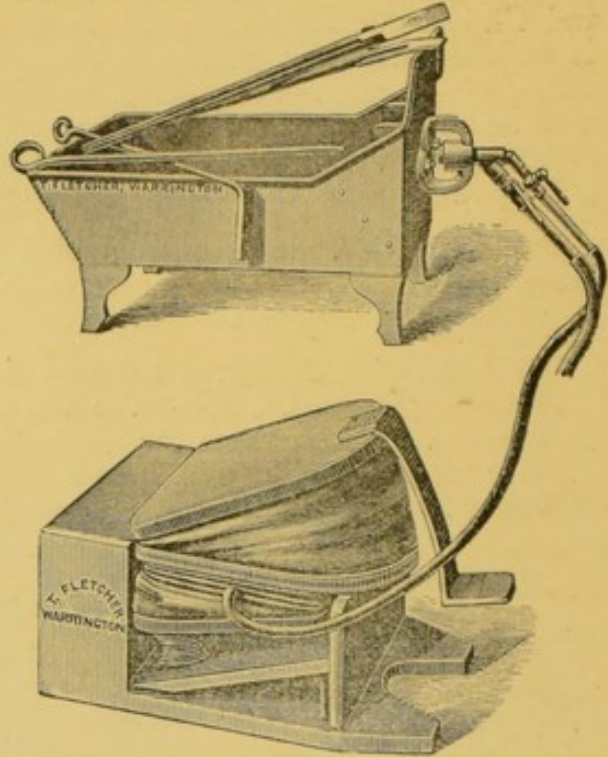
Size of Hearth, 15 × 18 inches.

The BLOWER No. 5, 9c, is FLETCHER'S New Foot Blower, dispensing with the use of the indiarubber disc, and fitting it for the roughest work.

It does not give so steady and powerful a blast as Fig. 9 or 9B,

but it is adapted for forge or blowpipe use, and, not being fastened to the forge, both blowpipe and blower can be taken away and used separately for brazing, &c.

The Blower, Fig. 9B, No. 5, is the best, if used with reasonable care. Fig. 9 is liable to damage with sparks, &c.



## INSTRUCTIONS.

Fill the hearth with coke, broken small (cinders may be used, but are not so clean); light the gas at the blowpipe, and use the blower. In a minute turn the gas out, and then turn on again a *very small quantity, not enough to burn at the blowpipe jet*, but sufficient to visibly brighten the fire. When the heat is obtained, the forge may be worked with or without gas, but a little gas doubles the power. **THE GAS MUST NOT BURN AT THE BLOWPIPE JET, EXCEPT FOR THE FIRST MINUTE.** If gas is not available, the vapour from the smallest size Generator, page 381, may be used precisely in the same way as gas.

The Blowpipe is the ordinary pattern, Fig. 8c, and can be removed for use as a blowpipe, making the whole apparatus complete for all small heating and brazing work. If a hood is required, it will be made any shape desired, price about 6s. extra. It is not usually necessary if coke is used.

## Price—

|                               |         |                              |         |
|-------------------------------|---------|------------------------------|---------|
| Blower only, No. 5, 9c ... .. | £1 15 0 | Hearth ... ..                | £0 15 0 |
| Do. No. 5, 9b ... ..          | 1 15 0  | Tools, as shown in Engraving | 0 5 0   |
| Blowpipe ... ..               | 0 10 6  | 6ft. Indiarubber Tubing      | 0 4 0   |

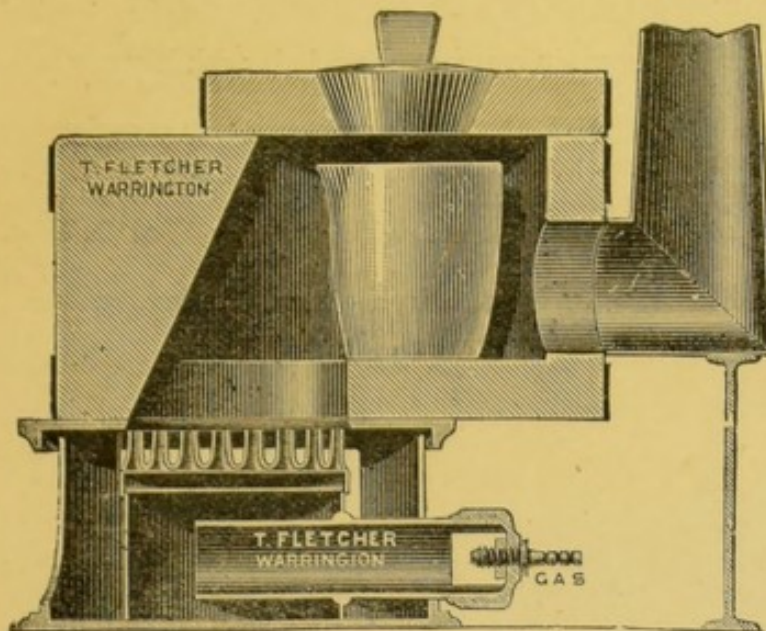
This can now be supplied either as engraved or with the blowpipe arranged to give a top heat on the coke.



FURNACES—*continued.*

**DRAUGHT CRUCIBLE FURNACES. Fig. 63.**

FOR COAL GAS OR AIR GAS.



For Brass Casting, Jewelers' and general purposes (Not for Cast Iron.)

No 163, taking crucibles not exceeding 3 by 2½ in., to melt 2lb. brass.

**Price complete, £1 10s.**

Extra crucibles, Salamander 4d.; clay 2d.; crucible tongs 1s. 6d. Gas supply required, 20 cubic feet per hour—½ in. pipe and tap.

No 363, taking crucibles not exceeding 4 by 3½ in., to melt 6lbs. brass; gas supply, 25 cubic feet per hour—½ in. clear bore gas pipe and tap.

**Price complete, £2 5s.**

Crucible tongs, 2s. Extra Salamander Crucibles, 1s. each. Clay Crucibles, 5d. each. Bow Tongs, 3s.

This pattern, in both sizes, can be used for oxidizing in cupels or shallow dishes, instead of a muffle furnace. The lid never requires to be lifted; it can be pushed sideways sufficiently to enable the crucible to be lifted out

**MUFFLE FURNACES,**

FOR COAL GAS OR AIR GAS.

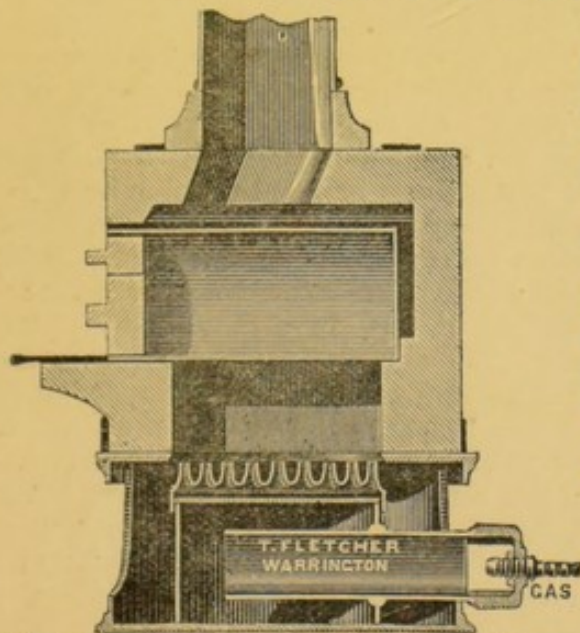


Fig. 61.—Muffle Furnace with Draught Burner, showing internal arrangement.

**No. 261.** — Space inside Muffle, 2½ in. wide, 2 in. high, 4½ in. long. **Price complete, 40s.**

Extra Muffles, Salamander, 1s. 6d.; clay, 9d.

The burner for this size is same as No. 163.

THE SAME ARRANGED AS A BLAST FURNACE for high temperatures. This requires about double the gas supply required for a draught burner. **Price complete with injector burner, blower No. 3, Fig. 9b, and tubing, 68s. 6d.**

For both draught and blast, **73s. 6d.** (both arrangements complete).

**No. 461.**—Space inside Muffle, 3½ in. wide, 3 in. high, 6½ in. long. **Price complete 50s.**



FURNACES—*continued.*

THE SAME ARRANGED AS A BLAST FURNACE, as specified, with blower **No. 5, Fig. 9b, 88s.** For both draught and blast, **£5.**

Extra Muffles, Salamander, 3s. 6d., clay, 1s. 9d. Gas supply required for the draught burner, 60 cubic feet per hour,  $\frac{5}{8}$  in. gas pipe and tap.

**No. 661.**—Space inside Muffle,  $5\frac{3}{8}$  in. wide,  $4\frac{1}{2}$  in. high, 9 in. long. Price complete, **£4.**

THE SAME ARRANGED AS A BLAST FURNACE as specified, with blower **No. 5, Fig. 9b, £5 18s.**

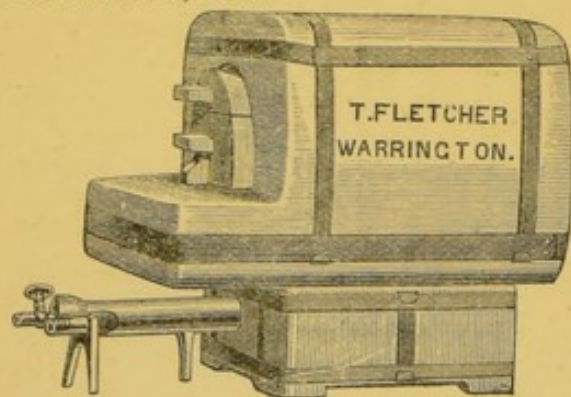
For both draught and blast, **£6 13s.** (both arrangements complete).

Extra Muffles, Salamander, 6s.; clay, 3s.

**No. 761,**  $6\frac{7}{8}$  in.  $\times$   $5\frac{7}{8}$   $\times$   $11\frac{1}{2}$  in., **£6.**

THE SAME ARRANGED AS A BLAST FURNACE, with blower, **No. 5, Fig. 9b, £7 18s.**

For both draught and blast, **£8 13s.** Extra Muffles, clay, 5s. 6d. Salamander, 11s.



Muffle Furnace, arranged for Blast, external view.

Gas supply required for the draught burner, 70 cubic feet per hour,  $\frac{5}{8}$  in. clear bore gas pipe and tap. All prices include one fire-clay muffle. Gas taps with large way through, kept in stock.

NOTE.—The blast cannot be applied to these whilst working with draught, and with the blast arrangement the gas supply must be about double that specified for use with the draught burners. For instructions for blast arrangement, see Injector Furnace.

## GENERAL INSTRUCTIONS FOR DRAUGHT FURNACES.

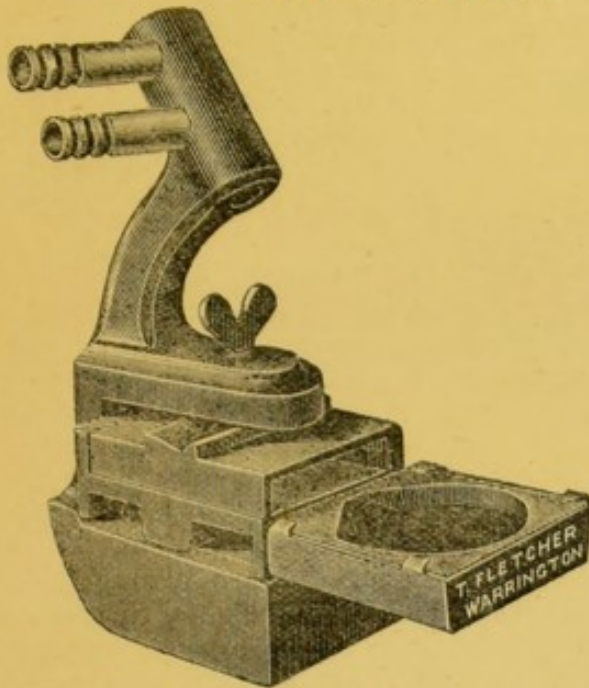
The gas supply tap and pipe must be large and clear, so as to give as great a pressure of gas as possible at the burner nozzle, although the actual consumption of gas is small. The indiarubber tubing used must of necessity be perfectly smooth inside. The tubing made on wire, whether the wire is removed or not, *will not work these burners satisfactorily.* All Crucible and Muffle Furnaces are sent out with a 2ft. 6in. chimney, having a cast-iron foot to enable it to stand steadily, and a short handle by which it can be readily lifted with the crucible tongs. The gas supply specified is required to work each Furnace at its full power, and the flame must be visible in the chimney. If the gas supply is deficient, the Furnaces can be worked at a lower heat by partially closing the top of the chimney until the flame becomes visible, or by working without the chimney. If the burner plate becomes red hot, it is a sign that the gas supply is deficient. The points of blue flame are always visible when the burner is looked into sideways, unless the gas supply is too small to work the Furnace satisfactorily. To light the burner without removing the upper part of the furnace, put a lighted taper through the burner casing up between the grooves in burner plate, then turn the gas on slowly. If the Furnace is hot it may be necessary to cover the air opening round the gas entrance to prevent the flame descending through the gauze at the moment of lighting. The burners can be easily taken apart, and must be kept clean.

Extra Grids, for Burners, 2s. each.



## Fletcher's NEW MELTING ARRANGEMENT.

### ADDITIONAL PATTERNS.



*Engraving slightly under half-size.*

For melting gold or silver rapidly, without the use of a furnace. In this arrangement the two parts of the ingot mould slide on each other, to enable ingots of any width to be cast, and the Blowpipe is part of the rocking stand. Connect the blower to the upper tube and the gas to the lower. When the metal is melted in the shallow crucible tilt the whole apparatus over so as to fill the ingot mould. A sound 3-oz. ingot can be obtained in about two minutes, and a 20-oz. in five minutes. Thousands of these are in use, and this arrangement is far superior to any furnace for small work. Very bulky scrap should be run into a mass in one of the moulded carbon blocks

before being placed in the crucible.

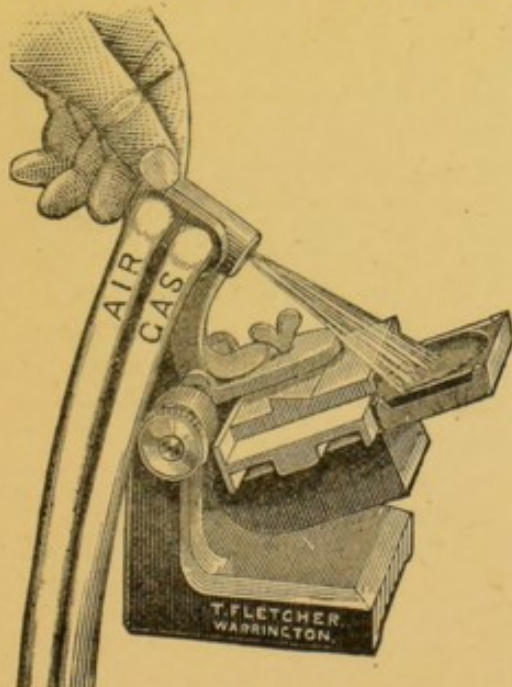
**Price**, as engraved, 3-oz. size, **10s.**

EXTRA CRUCIBLES, 4d. each; 3s. 6d. per doz. Slides to carry the Crucibles, 2d. each.

#### LARGE SIZE OF THE ABOVE.

To melt 14 ounces silver, or 20 ounces 18-carat gold, in 5 to 6 minutes.

**Price 23s.** Extra Crucibles **7d.** each. This requires a  $\frac{1}{2}$ -inch gas supply and Foot Blower No. 5 size.



The same arrangement on heavy swivel stand, to prevent risk of pulling over by the weight of the rubber tube when not held by the hand. Small size only, for 3 ounce ingots.

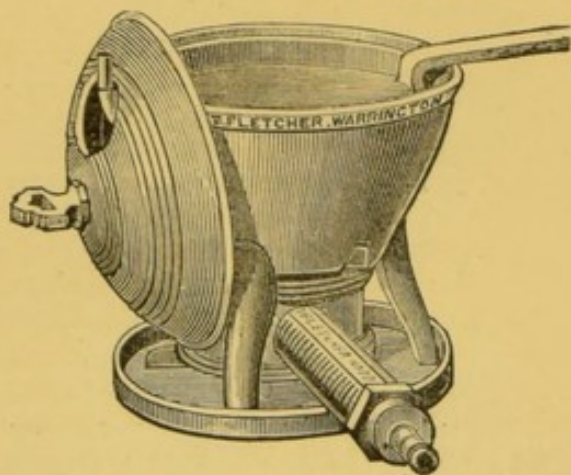
**Price 14s. 6d.** This addition is unnecessary in the large size.

Extra Crucibles 3s. 6d. per dozen.



## FLETCHER'S NEW LADLE FURNACES.

FOR LADLES AND SET POTS.



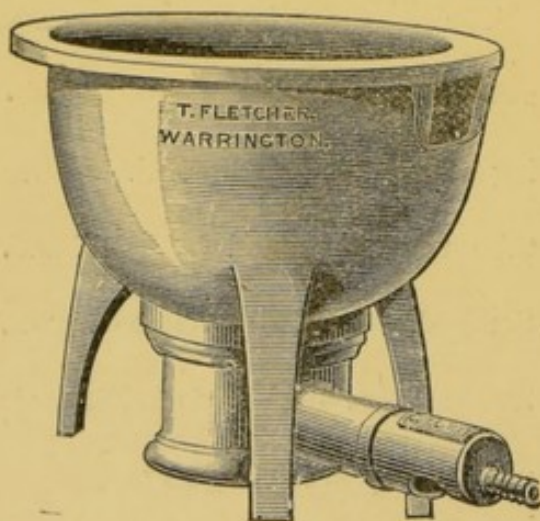
Small size, for 7 in. ladles.

admit the handles of different sized ladles at different heights, to enable them to be kept perfectly level.

**No. 2 Size Furnace** is made to take ladles  $8\frac{1}{4}$  inches wide,  $4\frac{1}{2}$  inches deep, outside measure. **Price**, complete with ladle bowl without handle, **20s.** Special handles to order.

**No. 2 Size, B Pattern.**—The same furnace with side flue and set pot for stereotypers, &c., to use with a small dipping ladle, and safe against splashes of metal on the burner. These can also be used as lead baths for tempering tools and similar work. **Price**, complete with set pot, as engraved below, and with a lid which fits the furnace, with or without the set pot, **22s. 6d.**

### No. 3 FURNACE FOR SET POT.



**No. 3 Size Furnace**, taking set pot 12 inches wide,  $7\frac{1}{2}$  inches deep, to hold 1 cwt. solder or stereo metal, which can be readily melted in 1 hour starting all cold.

**Price**, complete with set pot and burner, **27s.** No lid or stand is supplied with this size.

**No. 3** size requires a  $\frac{3}{4}$  inch clear bore pipe and tap, and is not made to take ladles which require a support over the burner.

It is desirable that this size furnace should stand under a hood to remove the burnt gas from the room, unless it is well ventilated.

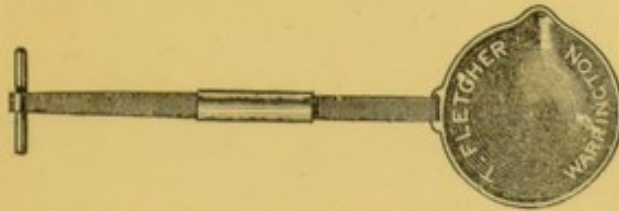


## FLETCHER'S NEW ZINC AND LEAD LADLE.

These ladles are made with both cast iron (for lead) and malleable (for zinc) bowls—true to shape and thickness.

The handles are bolted on and never wear out. A new bowl can be fixed in a few minutes.

The handles ensure perfect steadiness in pouring, and are ALWAYS COLD; the sliding handle being pushed to the cool end whilst the metal is being heated.



The bowl is 7 inches in diameter, and fits both old and new pattern small size and ladle furnace.

**Price, with cast-iron Bowl, 2s. 6d.; with malleable**

**Bowl, 3s. 9d. Extra Bowls: cast, 1s. 3d.; malleable, 2s. 6d.**

## FLETCHER'S TINMAN'S FIRE POT.

This is a new and substantial pattern, specially designed for workshops where coke stoves cannot be used.

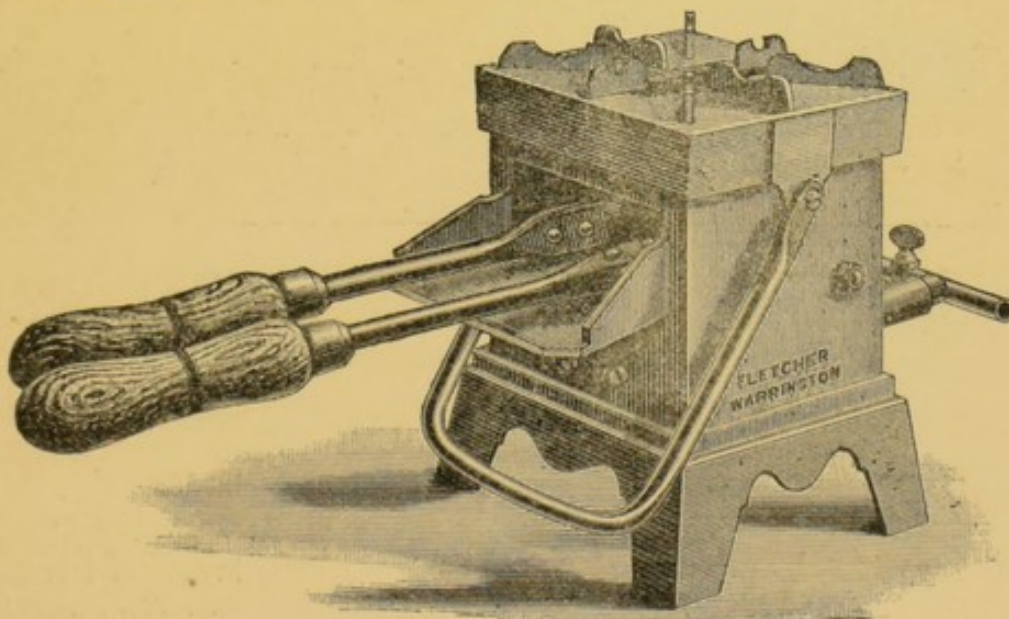
Each stove will heat rapidly either one or two large copper bits, and the waste heat after leaving the copper bits can be used for boiling breakfast cans, &c.

The top can be opened by a hinge and the stove used for heating ladles, making solder, or tinning.

The swing handle enables the stove to be carried about by case makers, &c., and the apparatus will be found a thoroughly good and practical workshop tool for permanent hard use.

**Price 15s.**

Lead Pot, with spout and swing handle, to hold and melt 20lbs. lead or solder, **3s. 3d.**

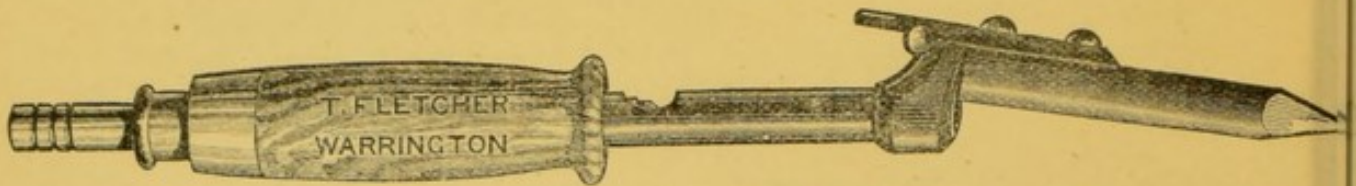




## FLETCHER'S Registered Self-Heating Soldering Bit.

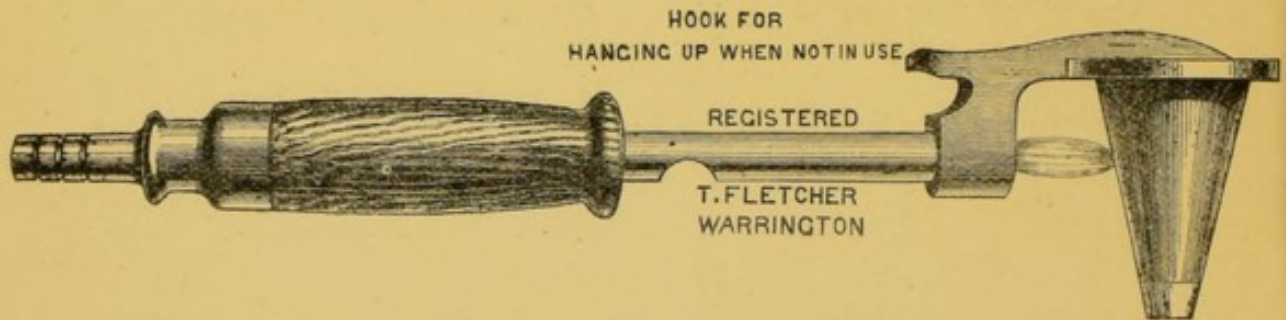
This is free from smell, heats rapidly, and will be found a first-class arrangement for case makers, stained glass leading, sardine box making, and similar work.

It is not suited for the heaviest class of copper-smiths' work.

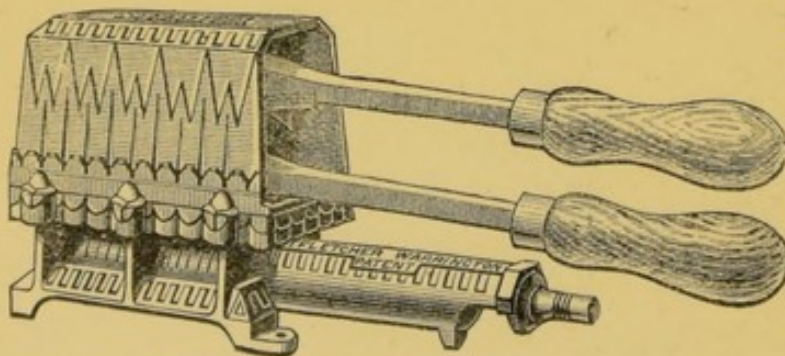


The copper can be renewed in a minute when worn down. The gas supply from an ordinary bracket, with the gas burner removed, will be found ample. **Price 6s.**

## FLETCHER'S REGISTERED SELF-HEATING SOLDERING BOLT FOR LEADED WINDOW MAKERS.



This will be found a first-rate tool for the special class of work for which it is designed, requiring very little gas, and being fully equal to the requirements of the quickest workman. It is cool to the hand, and perfectly clean in use. **Price 6s. 6d.**



tap to each burner, **7s.** per burner.

### **12 S. Price 4s.**

The same as 10 S, with cover for soldering bolts. This will heat two heavy bolts at once with one burner.

The same burners in sets of 2 or 3, on cast-iron stand, with



## PLASTIC FIREBRICK,

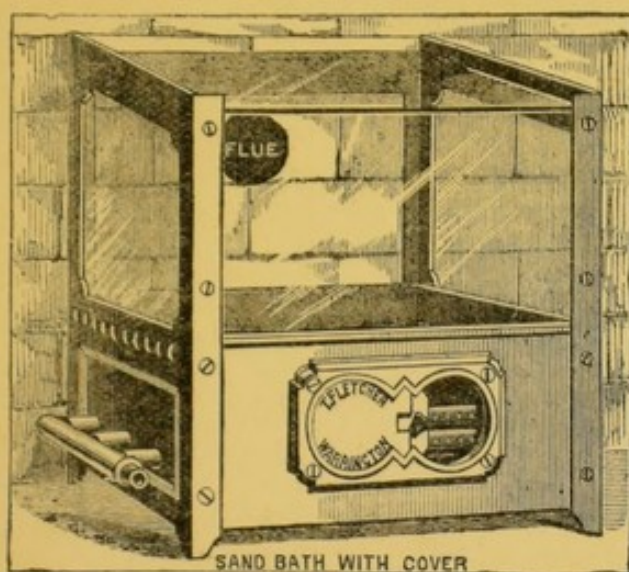
FOR ALTERING AND LINING FAULTY FIREPLACES WITHOUT REBUILDING, AND REPAIRING LABORATORY FURNACES.

Can be made by mixing liquid Silicate of Soda with ordinary Fireclay to the required consistency.

Silicate of Soda, in any quantity, 3d. per lb. Package of any quantity under 28lbs., 1s. extra. In 5 cwt. casks, at a lower rate.

The mixture ready prepared for immediate use, 14 lb. tin, 5s.; 28 lb. tin, 8s. This will not keep soft more than a few days.

This sets hard without requiring to be burnt in a kiln. If a thick body is required for filling up or altering fireplaces, the space should be filled with broken bricks, and the Plastic Firebrick used only to cement and fill up the crevices, so as to form a good smooth face.



SAND BATH WITH COVER

## SAND BATH FOR LABORATORY USE.

WITH COVER FOR EVAPORATING CORROSIVE LIQUIDS.

Size of bath, clear inside,  
12 inches square.

**Price**, with tap to each burner, so that the temperature may be controlled in any part, **45s.**

## SUNDRIES.

**JEWELLERS' SOLDERING COALS.**—Made of compressed willow charcoal (same as moulded carbon blocks). Size 2 × 2 × 6 inches, with flat sides.

**Price 1s.** One of these will last out 50 blocks of charcoal. **Size 1½ × 1½ × 5.**  
**Price 6d.**

**MOULDED CARBON BLOCKS** for supporting small work under the blowpipe. Cleanly, perfect non-conductors, and everlasting. **Price 1s. 6d. each.** (For use with small blowpipes only.)

These are circular, hollow on each face, and 4 inches diameter.

**FINE WILLOW CHARCOAL**, in sticks, free from flaws (selected sticks only), 1s. per lb.

**CHARCOAL** for Blowpipe Analysis with Brown Ash can occasionally be supplied. Price 2s. per lb.

**IN ORDERING** if the exact apparatus required cannot be specified, the work to be done should be precisely and minutely explained. Size of blowpipe jets should be stated.

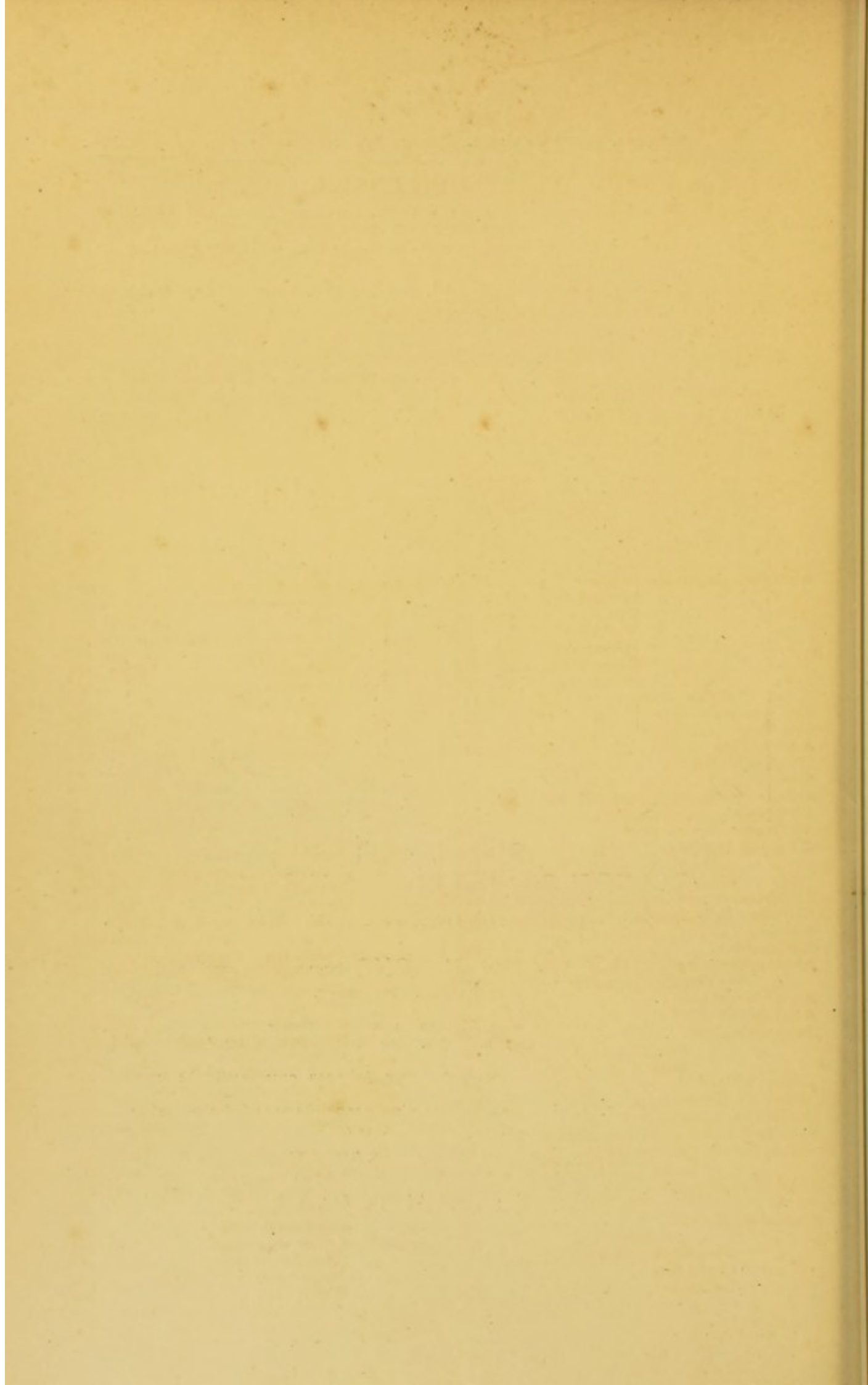
**ALL INDIARUBBER TUBING** used must be **SMOOTH INSIDE**, made without wire, and of as large a bore as can conveniently be used.

**RUBBER TUBING**, 1½-inch, 4½d.; ¾-inch, 6d.; ½-inch, 9d. per foot.

**TAPS FOR GAS** should be what are known as main cocks, with a large way through. For the smaller heating burners, ordinary taps will do if the way through is good and clear, but higher powers must not be expected with a deficient gas supply.

**IF THIS LIST IS THREE MONTHS OLD** please apply for a fresh one before ordering, as constant improvements are being made, and new apparatus being designed.





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