The problem solved : a practical treatise on artifical incubation & chicken rearing / by Chas. E. Hearson.

THE PROBLEM SOLVED

A Practical Treatise on

ARTIFICIAL INCUBATION & CHICKEN REARING

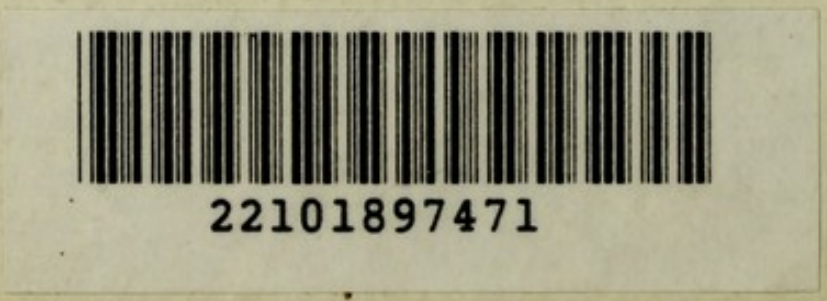
BY CHAS. E. HEARSON

BY ROYAL WARRANT

INCUBATOR MAKER

TO HIS MAJESTY THE KING

Entered at Stationers Hall.



BEWARE OF IMITATIONS.

REGISTERED TRADE MARK.

A Lacquered Brass Tablet of which the above is a pen and ink sketch, is affixed to every Hearson's Incubator, without which none is Genuine.

MANUFACTURERS OF

HEARSON'S PATENT CHAMPION INCUBATORS, FOSTER MOTHERS,

AND OTHER POULTRY APPLIANCES.

HEARSON'S SUN GAS-MAKING MACHINE,

HEARSON'S PATENT SOLID SECTIONAL GARDEN ROLLERS,

AND OTHER SPECIALITIES.

Published at 235, REGENT STREET, LONDON, W.

TWENTY-THIRD EDITION.

PRICE, ONE SHILLING.

SEASON 1903.

HEARSON'S

ORIGINAL AND CELEBRATED

Champion Incubators,

As specified in the enclosed Illustrated List, and fully described in the "Problem Solved," are, in consequence of

Improvements in Manufacture,

NOW

Reduced to the following prices,

VIZ.:	INLAND PRICE. £	s.	d.	EXPORT. £	s.	d.
No. 1 -	2	10	0			
„ 2 -	3	5	6	3	13	0
„ 6 -	5	8	6	5	18	6
„ 11 -	8	3	6	8	16	0
„ 20 -	12	17	0	13	12	0
„ 35 -	8	6	6	9	1	6
„ 45 -	12	17	0	13	12	0

For NOTES and TERMS, see page 8 herewith, or page 2 "Problem Solved."

THE PROBLEM SOLVED.

CHAS. HEARSON & CO., LIMITED,

By Royal Warrant,

INCUBATOR MAKERS TO

HIS MAJESTY THE KING,

235, Regent Street, London, W.

NOTES.

Unless otherwise ordered, petroleum lamps are sent with all our Incubators; but when ordered for gas, a set of fittings will be supplied in lieu of the lamp, without extra charge.

Purchasers living more than 600 feet above sea-level should advise us of the elevation, so that we may adjust the regulator before sending the apparatus away.

The Champion Incubator having long since passed the doubtful stage, customers are advised to order the sizes suited to their requirements at first, instead of getting small ones for experiment.

We only deal in new goods, and cannot therefore take back Incubators which have been used, nor exchange them for larger ones; nor do we send out goods on trial, on loan, or on the hire-purchase system.

We do not appoint agents in any part of the United Kingdom.

Goods requiring Alteration or Repair, must be sent to our Works,

68, WILLOW WALK, BERMONDSEY, LONDON, S.E.

carriage paid, the sender's name being in every case enclosed.

To secure prompt attention a letter, giving full particulars of what is wanted to be done, must also be sent by post to the same Address.

Empty Packing Cases, if returnable, are so marked inside the lid, and the amount we allow for them will be credited at once, and remitted at the earliest opportunity.

TERMS.

Our prices are net for Cash with Order.

Prepaid purchases amounting to £4 and upwards will be forwarded, carriage free, per goods train, to the customer's nearest railway station in England and Wales, unless otherwise specified.

Cheques should be made payable to CHAS. HEARSON & CO., LIMITED, and crossed "London and Westminster Bank, St. James's,"

To avoid delay and loss, purchasers should be particular to write their name and postal address and the name of their railway and railway station very distinctly.

On receipt of the goods they should be carefully examined before the carrier's sheet is signed, and the sheet should be noted, "*Contents not examined*," or "*Contents damaged*," if the consignee is not satisfied that the contents are in good condition.

PREFACE

TO THE TWENTY-SECOND EDITION.

THE ever increasing popularity of the "Champion" Incubator has of late years induced quite a number of competitors to enter the field with apparatus more or less imitations of our well-known machines.

At no time since the introduction of our Apparatus can we say that we have held the field without opposition, but our earlier rivals, instead of copying us, sought to minimise the importance of the advances which we had made by striking out into paths diametrically opposed to the principles laid down in "The Problem Solved."

Time, however, which tries all things, has consigned most of our early competitors to oblivion, and if any evidence of the soundness of the principles with which we first set out be required, it is to be found in the fact that success is only achieved by our up-to-date rivals just in proportion as they internally or externally appropriate our ideas or copy the phraseology of our books, in order to lure the unwary.

Beginners cannot, of course, be expected to know the imitation from the genuine articles; so, for their guidance, we will briefly state that every Incubator having a damper over the lamp chimney, which in rising allows the surplus heat to escape, when the interior is at the required temperature, is an imitation of our apparatus. So, also, is every Incubator in which the temperature is regulated by a capsule lifting this damper off the chimney.

There are numerous other points wherein we are imitated, which are of no great importance, and some others of consequence which our rivals dare not copy; but, broadly speaking, any Incubator which corresponds at all to the apparatus described in this book, is to that extent a "crib."

No one better than ourselves can appreciate the inventor of a new idea; but the mere imitator is on all points a contemptible thing. whether he renders himself amenable to the law or escapes by the skin of his teeth.

It goes without saying that every Incubator-maker claims to have made an invention and patented it—a very simple matter, entailing the making of a declaration, and the payment of certain fees ; but, for the guidance of those who desire to possess the latest improvement, we have no hesitation in saying that since the first appearance of our apparatus there has been no real advance whatever in Incubators. This is eighteen years ago, and the only alterations effected in our apparatus have been in the direction of making it more durable, without in any way changing the principles of the Incubator itself. Thus the " Champion " has held its own, not only against inventions of home growth, but against the combined inventive skill of the whole world.

Our old friends will remember that our first appearance in 1881 was the signal for a volley of ridicule and opposition against our interference with the ways of Nature. We have, however, outlived all this, and convinced the world that artificial incubation is the key-note to successful poultry keeping.

The appearance of this edition marks the opening of a new century, in which, in the writer's opinion, artificial incubation will play a much more important part among home industries than it has in the century about to close.

We recommend the reader to mark, learn, and inwardly digest the description and mode of working of this apparatus, in the confident anticipation that he will come to the conclusion that nothing simpler or more perfect can be either desired or devised.

Yours truly,

CHAS. E. HEARSON,

Inventor and Managing Director.

INTRODUCTION.

TO THE TWENTY-THIRD EDITION.

THE "Champion" Incubator has now been before the world over 20 years, and has achieved a reputation which eclipses all competitors.

Those who have once used our Incubators never give them up because they have found something better.

There are more of Hearson's Incubators in use than of all the other patterns put together. When we sell an Incubator it is used, and not thrown aside after trial as many others are.

When an Incubator is no longer wanted, it can be sold second-hand for more money than most of our contemporaries' can be bought for when new.

We warn the public against imitators of our Machines, who, under the pretence of making improvements, suppress valuable parts to cheapen the cost; also against others who add trivial complications to overcome faults which do not exist in our apparatus. Both those who add, and those who take away, do but set traps to catch the unwary. Those who have experience of our Incubators and Foster Mothers, know quite well that our Apparatus do not want improving.

Every Hot-water Lamp Incubator now on the market, is more or less a poor imitation of Hearson's "Champion," but we can state positively that no improvement has been made by any one of our imitators which can add to the usefulness of our Apparatus one iota. We disapprove of corrugated drawer bottoms, egg turners, insulated or shielded Capsules, bent Thermometers, self-filling Lamps, and all other dangerous and complicated adjuncts which detract from the simplicity of our Apparatus.

If you want an Incubator and cannot afford a good one, don't buy one at all: a low-priced Incubator is false economy. It wastes Oil, it addled Eggs, it loses Time, and hatches bad Temper instead of Chickens.

Mr. Hearson is the Original Inventor of the Thermostatic Capsule, and of all those other accessory parts, without which all previous attempts at Incubation ended in failure.

The ease and certainty with which chickens can now be hatched is perhaps best realised by a visit to our Show Rooms, 235, Regent Street, W., where we have hatched chickens every day of the week, all the year round, for 20 years past. The operation is still going on, and there, on any day of the week, at almost any hour of the day, visitors can drop in and see the chickens still coming out.

Lovers of Poultry, all the world over, cannot fail to recognise the impetus which Mr. Hearson's Incubators have given to the Poultry Breeding Industry, and believing that the encouragement he has hitherto received will be continued, he confidently looks to his friends and customers to support him in making the coming year a record one.

ALL PREVIOUS LISTS CANCELLED.

Dated January 1, 1902.

DESCRIPTION.

The Numbers enclosed in brackets, scattered throughout the letterpress, refer to corresponding paragraphs.

1. In perusing the following pages it should be borne in mind that the use of Hearson's thermostatic capsule, for regulating the temperature of the egg drawer, is the principal feature which characterises the Champion Incubator, and distinguishes it from all others. The introduction of this patent capsule marks an advance in the art of incubation which it is impossible to over-rate, the striking advantage obtained by it being that, without any attempt on the part of the operator, the apparatus (if the instructions are carefully followed) will, in the course of a short time, come to the required temperature, and maintain that temperature automatically, regardless of external circumstances. This certainty of action and self-adjustment of temperature are points which we believe no other makers of Incubators lay claim to, and are improvements which ensure success in the hands of persons who know nothing of the sciences involved, but who desire to hatch either for profit or amusement, and enable the supervision of the attendant to be dispensed with, except at such times as the eggs require attention or the chicks removal.

2. Hitherto the most serious difficulty in the way of artificial incubation has been the maintenance of a regular temperature in the egg drawer, the principal causes which operate to make the temperature irregular being: the changes of temperature in the apartment in which the apparatus is placed; the sudden increase of heat which follows the addition of boiling water at intervals to those apparatus worked by that means; the fluctuations in the pressure of gas when that is used as a source of heat; and the gradual diminution of the activity of the flame when an oil-lamp supplies the place of gas.

3. That irregularities should arise from such changes will perhaps be obvious to everybody; but there are other sources of error which are not so patent, but which require to be guarded against with equal care, such as the change which takes place within the egg from the tenth to the fourteenth day. In the best-known Incubators this has to be allowed for, as the young chicks then begin to generate heat naturally, and do not therefore require to be supplied with so much artificially.

4. Besides the causes enumerated, the opening of the drawer at intervals, and the damping and ventilation which are necessary in all apparatus, introduce further distributing elements.

5. The contrivances which have been designed for the purposes of temperature regulation are legion. Nevertheless the problem of how to effect this perfectly remained unsolved until the advent of the Champion Incubator.

6. The general reader will doubtless look on this statement as a business puff, but to the scientist such a statement contains nothing but a plain fact.

7. Incubators regulated by thermostatic bars, electric current, expanding air chambers, clockwork, and a dozen other equally complicated contrivances have appeared, and some such are still before the public, and are offered as automatic and thermostatic; but we must state without hesitation that the Champion is the only Incubator which can be set at any desired temperature, and which will maintain that temperature for twelve months together within five degrees without readjustment.

8. Those who have already experimented, and failed, know how vital the regulation of temperature is to success, and appreciate the superiority of our apparatus. But our remarks are chiefly directed to those who, without any previous experience, might, by putting too much faith in, advertisements, be led to purchase an apparatus professedly self-regulating, and find, too late, that this most important quality is present in name only.

9. We have pointed out the causes which operate to disturb the steadiness of temperature in Incubators, and we will now proceed to show that we have overcome all these difficulties, and so arranged the parts with respect to one another that the humidity of the air, the ventilation. and the temperature are uniform, no matter how severe the disturbing actions of the surroundings may be. This being achieved, the caution, care, and forethought required to work any other make of Incubator may be dispensed with, and the operator's attention be confined to turning the eggs and taking care of the chickens.

10. As a knowledge of first principles is essential to the comprehension of nearly every new thing, we will, for the benefit of those who have not thought the matter over for themselves, make a few self-evident statements before proceeding to a description of the apparatus.

11. Every chemist and nearly every schoolboy knows that when water boils the resulting vapour measures several hundred times more in the form of steam than it did whilst it was in the condition of water, and further, if we boil water in a closed vessel, either the sides will distend as they would do if made of india-rubber, or the vessel will burst, provided it be not strong enough to withstand the pressure of the steam formed within.

12. This enormous expansion at the boiling point is common to most liquids, and confining our remarks to such liquids as change into vapour or steam without decomposition, we will further add that if the vapour thus formed be cooled, it will return to the liquid state and occupy precisely the same space it did before we boiled it; and this heating and cooling may be repeated as often as we like, and still the quantity of liquid or water will remain the same provided the containing vessel be hermetically sealed.

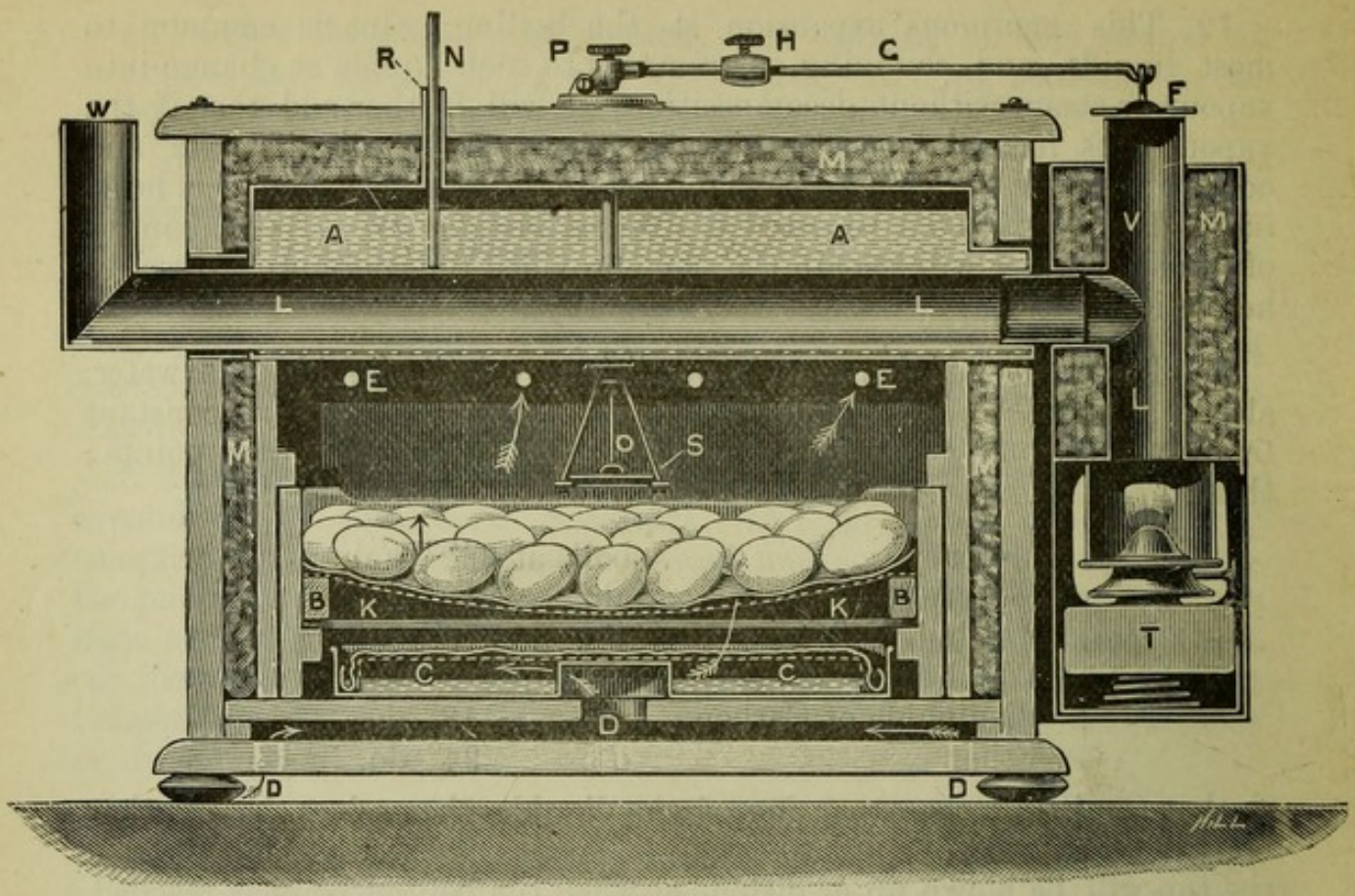
13. Under normal barometric conditions volatile liquids like water, alcohol, naphtha, turpentine, ether, &c., boil at various constant temperatures, and these temperatures are called their boiling points; thus;

Mercury	boils at	662° Fahr.
Water	do.	212° do.
Alcohol	do.	173° do.
Wood Spirit	do.	149° do.
Bisulphide of Carbon	do.	118° do.
Ether	do.	94° do.

so that (omitting the expansion of the liquids themselves before they boil) if we put any one of them into a closed vessel with a flexible top, the top will be blown up or distended when the boiling point is reached.

14. We have thought it necessary to make the ground clear by this explanation, because the regulation of the "Champion," is affected by putting about twenty drops of a liquid (which boils just below the temperature which we wish to maintain in the egg drawer) between two pieces of thin metal which have been previously soldered together at their edges, thus forming a hermetically-sealed capsule, not unlike the india-rubber air-cushions used by invalids and railway travellers. Now, so long as this little capsule is not subjected to sufficient heat to make the contents boil, the opposite sides lie quite close together; but as soon as the warmth is great enough to vaporise the liquid, the two sides are distended just as an india-rubber cushion expands when we blow into it.

15. We will show you presently how the expansion of this capsule is utilised to regulate the temperature of the egg drawer; but it will be necessary, in the first place, to explain the general construction of the Incubator.



15A. *Section of a Champion Incubator showing the Internal Arrangements.*

For names of parts, see (50).

16. The above is a section of the Incubator from left to right, and shows how it would appear if cut through in a line with the lamp-burner.

17. The upper part of the box contains a tank of water A A, through which a pipe or flue L L, passes from one side to the other. In practice, we return this flue through the water to still further extend the heating surface, and improve the appearance of the apparatus ; but have shown it only carried straight through in the section to simplify the drawings.

18. The flue L L is turned up at both ends, but at one end the vertical piece of pipe V is continued downward to receive the heated products of combustion from a lamp or gas flame which burns directly below the opening.

19. The upper end of the chimney V is furnished with a plate of metal or damper F, which (when resting on the top of the chimney) entirely prevents the escape of the heated air in that direction ; the consequence is that the whole of it is compelled to pass through the horizontal flue L L in the water tank, and up through the chimney, W

most of the heat being parted with on the way. When, however, the damper F is considerably raised the whole of theheated air will escape at the outlet V, and none of it will go through the horizontal flue in the water tank.

20. You will doubtless perceive that if by any means we can make the changes of temperature in the drawer operate this damper, we shall be able to control the heat of the water by utilising the whole or any part of the heat derivable from the lamp.

21. The illustration shows the little damper F suspended at the end of a light lever G, the opposite end of which is pivoted to a frame fixed on the top of the wooden case.

22. At a short distance from the pivotted end a piece of stiff wire O descends quite through the water tank, a small tube being provided to protect it, so that the water does not interfere with it.

23. Directly under the end of this wire, in the space above the drawer, is a little table which is fixed at such a distance from the water tank as will allow the drawer to be removed without disarranging it. On this little table you will observe the metal capsule S, and it is on the button of this capsule that the lower end of the wire O going through the tank rests.

24. In this way we have established a communication between the capsule in the drawer and the damper; now let us see how the latter will be affected by changes of temperature in the drawer.

25. We have already explained how the capsule expands as soon as it gets hot enough to make the enclosed liquid boil; and for the sake of illustration we will suppose that the Incubator has been in use, but that we have had the drawer out for a few minutes to look at the eggs.

26. Under these conditions the damper F will be resting on the chimney V, because the capsule has been cooled, and has consequently collapsed; but, if we put the drawer in its place, the heat will in a short time accumulate and the liquid will boil. When it does so, the top of the capsule will be distended, and the wire O will be moved up a short distance. The motion thus communicated to it will be considerably multiplied by the lever, so that for a slight expansion of the capsule the damper will rise far enough from the chimney to allow the heat from the lamp to escape by that outlet.

27. In practice, we seldom find the damper rise more than one-eighth of an inch, such rise depending entirely on the excess of heat to be disposed of; for it must be understood that only the surplus will be shunted out of this chimney. The position of the damper, therefore, furnishes a most reliable index of the heat required, for if the damper be found to stand more than one-eighth of an inch above the top of the chimney, we know we are burning more gas or oil than we need do, and

the flame may be lowered until the most economical point is reached. But the flame of the lamp or gas must always be turned a little higher than is absolutely necessary, so that there shall be at all times a reserve to provide against a fall of temperature in the external air.

28. Should the pressure of the gas increase, or the lamp flame be turned too high, that will make no appreciable difference to either the water or the drawer, as the little damper will rise and shunt the surplus instead of sending it through the water tank, a variation of one-tenth of a degree being quite sufficient to shunt the whole of the heat out at the top of the chimney.

29. The reader who has succeeded in mastering the preceding pages will now clearly understand that **the Champion Incubator maintains a regular temperature by getting rid of whatever heat the flame may produce in excess of that required for the purpose of incubation,** and a little consideration will also render apparent the fact that **any Incubator working** with **a petroleum lamp must** either **directly or indirectly waste a portion of the heat supplied by the fuel,** whenever the flame is in excess of the required height.

30. It is, therefore, merely a question of expediency whether we raise a damper from a chimney and allow the heated products of combustion to escape at that outlet, or operate a ventilator, and cause a flow of cold air to carry away the surplus heat imparted to the eggs by the overheated water tank.

31. Reasoning on the ill-effects produced by sitting in a draught, the reader will not be slow to comprehend what would be likely to happen to the delicate organisation of an egg placed in a similar situation, and the failure of previous Incubators, in which the temperature was fairly regular, was no doubt due in a great measure to the pernicious effects of cold air currents on the heated eggs.

32. Our own experiments, and those of other investigators, confirm the opinion which this parity of reasoning leads to, and convince us that no system of incubation, in which heat is disposed of by ventilation, can produce such good results as have followed the regular change of air provided for in the Champion.

33. When gaseous fuel can be obtained, there is no longer any question as to the method of utilising it, and it becomes encumbent on the inventor to increase or diminish the consumption instead of discharging a portion of the heat wastefully. The attachment shown on page 29 of this pamphlet does this effectually.

34. Many people have a theory of their own about the best temperature for hatching, so we have added a little arrangement for varying the temperature of the drawer as desired; but if the Champion Incubator be started and no attempt be made to regulate it, the heat will increase until

it reaches a temperature between 97° and 100°, beyond which it will not rise no matter how high the flame be turned. But 100° is too low a temperature for successful incubation. Therefore, when the apparatus has been working steadily at this temperature for an hour or two, the lead weight H must be moved along the lever towards the damper, a little at a time until the desired heat is registered on the drawer thermometer, the drawer being kept closed the whole time.

35. The temperature at which incubation can be most successfully carried on varies inversely with the temperature of the room in which the Incubator is placed, which means that we require a comparatively cool Incubator in a warm room, and a comparatively warm Incubator in a cool room. The table (89) shows the drawer temperatures desirable for every 10° of external variation.

36. We have stated that under the normal pressure of the atmosphere liquids boil at fixed temperatures, but we must now add, that if we put a pressure on them their boiling is retarded, and this is the object of the little weight which slides along the lever. Perhaps you have seen the same arrangement on steam boilers, and know that if the weight be moved toward the free end of the lever, the safety valve is held down more forcibly, and that the pressure and temperature of the steam increase in proportion to the load. Precisely the same action takes place in the capsule, which is a little boiler ; and when we load it heavily, we must heat it to a higher temperature before the expansive force of the steam is able to distend its top.

37. Many attempts have been made to regulate Incubators by taking advantage of the fact that water boils at 212°, the theory being, that if the source of heat were constant, an equal temperature would be maintained in a drawer placed a certain distance from it. In practice, however, this was not found to be so. We made several forms of Incubators with tanks in which the water was regulated with such precision that it did not vary half a degree day nor night for a week ; but we found that a thermometer placed in the egg drawer varied fully half as much as the external air, and now that we have had some experience with the improved method of regulating, the reasons are very apparent, as will be seen by a study of the diagram on the next page. This shows the way in which the tank, drawer, room, and barometer varied during the trial of a No. 6 Incubator for twenty-one days, at a time when there was considerable atmospheric disturbance.

38. The line A shows the extent to which the temperature varied in the room ; the line B represents the thermometer, the bulb of which was inside the drawer and the scale outside, so that it could be inspected without opening the drawer ; the line C indicates how the heat in the tank rose as the temperature in the room fell, and proves conclusively that a tank of water kept at one temperature cannot keep the heat of a drawer placed below it at anything like a regular temperature ; for as

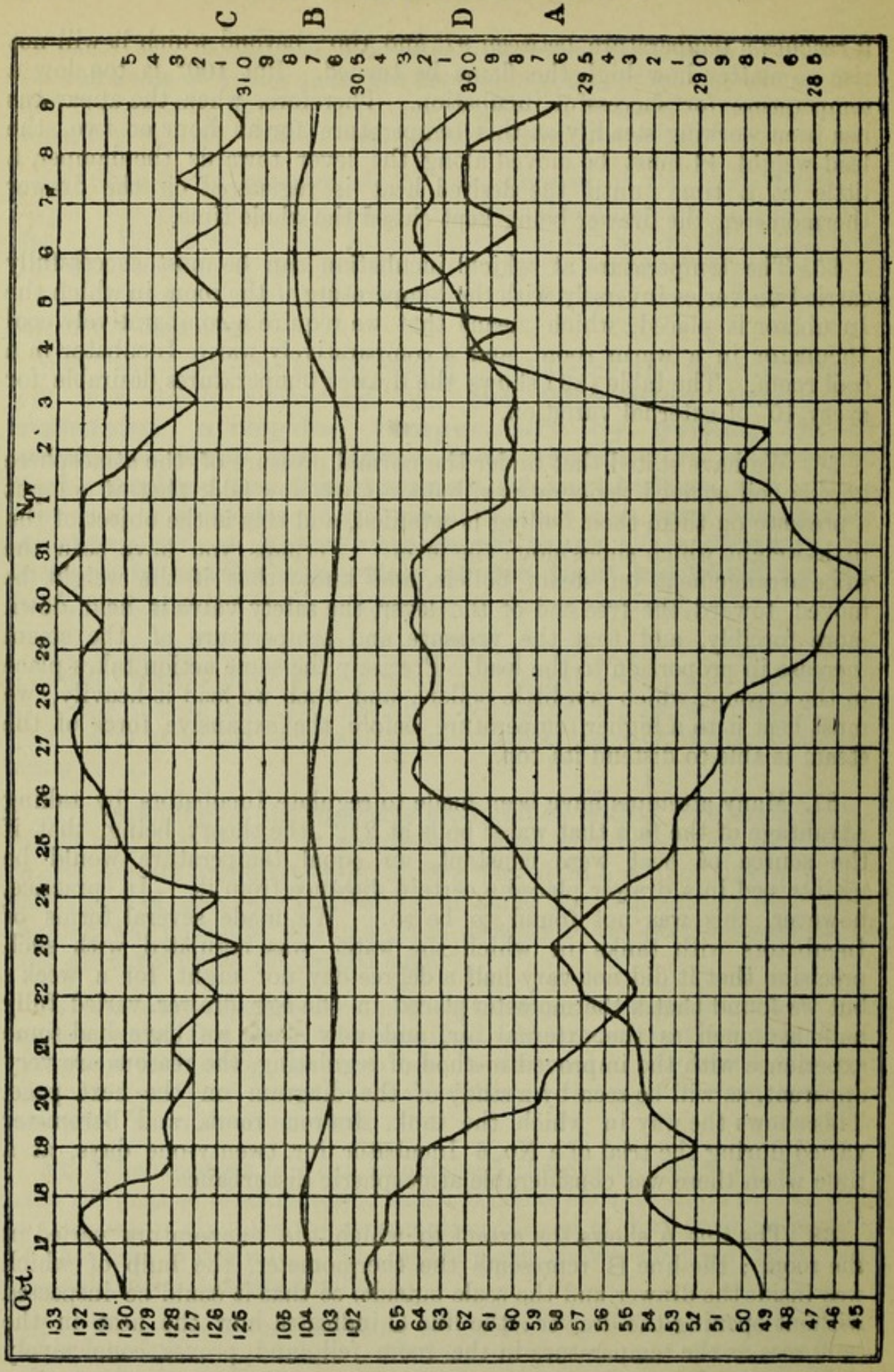


DIAGRAM SHEWING THE VARIATIONS IN TEMPERATURE IN HEARSON'S CHAMPION INCUBATOR.

the weather gets colder, the water has to be hotter to balance the effect of increased radiation, and when the weather increases in temperature the water must be colder if we would maintain the same temperature in the egg drawer. The line D shows the variations of the barometer during the trial. If the Incubator under trial had been larger than No. 6, the line C would have been somewhat lower than in the diagram, and conversely, if the Incubator had been one of the smaller sizes, the line C would have been considerably above the present limits of the scale.

39. In this experiment no attempt was made to adjust the drawer temperature by moving the weight, and it will be seen that the greatest variation which took place during an external fall of 20° was, without a doubt, less than would have happened under a good sitting hen, viz., $2\frac{1}{2}$ degrees.

40. Directing your attention once more to the egg drawer, you will see that the movable bottom is concave. By this arrangement the eggs are equally heated, and do not require moving from place to place.

41. A shallow zinc tray occupies the space under the drawer, and the runners of the latter are so arranged that the tray is left behind when the drawer is taken out.

42. The water in this tray requires replenishing about twice a week.

43. There are holes in the bottom and also at advantageous points round the upper part of the drawer space through which a regular current of air circulates.

44. Six or eight times as much air as is necessary for the supply of all the chickens which can be hatched in any particular sized Incubator passes through these ventilating holes; consequently, the air in the drawer is always in a fit state for respiration.

45. All the air which enters the Incubator is filtered through a piece of coarse fabric kept damp by water in the tray C, and those who are acquainted with Dalton's tables of the tension of water vapour, will know that the amount of aqueous vapour which the air will carry with it depends on the temperature, and as this is constant, the moisture will always be the same.

46. The usual source of heat is a petroleum lamp, as shown in the section, but where coal or air-gas can be obtained the trouble of trimming and filling the lamp will be avoided.

47. The lamp of a No. 6 Incubator burns about thirty-six hours, and should be refilled, and, if necessary, retrimmed every day; smaller Incubator lamps should be refilled every eighteen hours, as they do not last so long. The duration of the larger Incubator lamps is the same as a No. 6.

48. By putting slips of wood under the egg tray, the bottom may be raised at pleasure, according to the sizes of the eggs employed, All Incubators are sent out with the egg tray in a suitable position for hen eggs. When hatching pheasant, or other small eggs, the slips of wood below the egg tray should be stood on edge, but for eggs larger than those of hens the wooden slips should be taken away altogether. The object of thus raising and lowering the drawer bottom is to make the top of those eggs nearest to the thermometer bulb level with the under side of it. The drawer bottom of a No. 1 Incubator is not movable.

49. All our Incubators are sent out complete, and require only oil or gas for the lamp or burner, and a few gallons of warm water to commence operations. They are well made of pine wood, dovetailed, stained and varnished, and all mountings are of lacquered brass. Numbers 6, 11, and 20 have the upper part fitted with a drying-box, the lid being of glass, so that the chickens may be seen.

50. NAMES OF PARTS OF INCUBATOR.

The letters refer to the Sectional Drawing (15A).

A A Tank of water.
B B Movable egg tray.
C C Water tray.
D D D Holes for fresh air.
E E Ventilating holes.
F Damper.
G Lever
H Lead weight.
K K Slips of wood.
L L L Lamp chimney and flue pipe
M M M Non-conducting material.
N Tank thermometer.
O Needle for communicating the expansion of the capsule **S** to the lever **G.**
P Milled-head screw.
R Filling tube.
S Thermostatic capsule.
T Petroleum lamp.
V Chimney for discharge of surplus heat.
W Do. for discharge of residual products of combustion.
X Glass Chimney, covered with asbestos.

The overflow tube is the upper one, situated at the right-hand side of Incubator, and the lower tube is for emptying the tank.

INSTRUCTIONS

FOR STARTING AND WORKING

CHAMPION INCUBATORS.

These Instructions are to be carried out in the same order in which the paragraphs are numbered, and particular attention should be paid to the words printed in italics.

Each paragraph is more fully explained in "Answers to Correspondents," and, to facilitate reference, the paragraphs there are numbered 551, 552, 553, *&c., instead of* 51, 52, 53, *&c., as in this chapter. You are particularly requested to study the Answers to Correspondents before writing to ask questions which are already answered there.*

Unpacking.

51. Remove the screws from the packing-case, take the Incubator out and place it on the empty packing-case, a table, or other support, so that it stands at a convenient height ; see also that it stands *steady and level.* If it should not do so at first, a few folds of paper placed under one of the feet will steady and level it without further trouble. Any quiet, well-ventilated indoor room, or any outhouse, except an iron or glass building, will answer the purpose of a hatching room, and if possible the door should be kept locked, as few people can resist the temptation to have a look inside.

Filling the water tank.

52. Take out the egg drawer and water tray, place them aside, and remove the cap of the overflow. The overflow tube is the upper one, situated at the right-hand side of Incubator, and the lower tube is for emptying the tank.

53. Fill the tank with warm water at the tube R until it runs out at the overflow tube, and replace the cap. *The water when put in should not be hotter than 120° Faht.* The temperature should be taken before the water is poured into the tank. The longer thermometer sent with the apparatus may be used for the purpose, but you must *on no*

account put either of them into water *hotter* than the highest temperature *marked on the scale*, otherwise, when the thread of mercury reaches the top of the scale, the bulb will be broken. The proper way is to add boiling or hot water to cold until it reaches 120° ; in this way all risk is avoided. About every three months unscrew the overflow cap and add a little tepid water to replenish any lost by evaporation.

Caution.

Filling the lamp.

54. Fill the lamp with American kerosene or petroleum, trim the wick, so that when burning it shall produce a flame without tails. Refill the lamp every twenty-four hours, and trim the wick as required.

55. Light the lamp, put on the chimney, and turn the flame low to prevent smoke.

Caution.

56. To put the lamp into the lantern, pass your fore-finger through the looped handle and press the thumb-piece as far down as it will go ; slide the lamp into the lantern, release the thumb-piece, and you will now find that the chimney touches the horizontal partition in the lantern, and so establishes a direct communication between the lamp burner and the flue. If the communication is complete, the oil good, and the lamp properly trimmed, there will be no smell whatever.

57. Turn the flame to about *half the height* at which it will burn without smoking. When using gas the flame should only be turned to about one-third the size which the burner will give. Do not alter the gas burner sent with the lantern. We prefer to use a larger sized tip than is necessary, as it is not so liable to get choked in course of time.

Adjusting position of needle and capsule.

58. Examine the wire which goes through the tank into the drawer space, see that the lower end of it stands in the centre of the button of the regulating capsule, and that the upper end rests in the socket of the milled-head screw P. Hang on the damper F and slide the weight H as far as it will go *to the left.*

Adjusting the damper.

59. Turn the milled-head screw in and out until it moves the lever up and down. See that the latter works freely, and that the damper hangs directly over the chimney in which the flame burns.

60. Turn the milled-head screw P so that the damper *(now that the drawer is out) just rests comfortably upon the top of the chimney*, and do not afterwards move the screw P unless you think that the adjustment is imperfect. Whenever the egg drawer is taken out, the damper should automatically come to rest on the chimney. Should it be necessary to re-adjust the damper, *remove the egg drawer before commencing operations.* The screw P should on no account be turned *whilst the egg drawer is in its place.*

Arranging the water tray

61. Half fill the water tray with water at 80° and replenish the supply twice a week, or as often as may be necessary to replace that lost by evaporation. Turn the coarsely perforated zinc tray upside down over water tray as shown in the section 15A ; wet the double canvas and lay it

over the perforated zinc, taking care to tuck the edges down all round into the water; now put the water tray into the space under the egg drawer. Take care to keep the canvas wet, and once a week clean it and the water tray with boiling water to kill the germs of mould and bacteria. Remove the two screw-eyes inside the drawer to release the drawer bottom, and raise or lower it to suit the eggs to be hatched (48); place the single canvas on the perforated bottom of the egg drawer, for the eggs to rest upon; put in the egg drawer, and do not take it out again until you have regulated the temperature to the degree at which you propose to work.

The use of the thermometers

62. Drop the longer thermometer gently down the filling tube, and in a few minutes make a note of the temperature of the water, which will be found to increase constantly until the damper rises. Leave the thermometer there for future observation. Push the shorter thermometer through the hole in the drawer front until the paper stop on the thermometer registers with a stop inside the paper tube. This thermometer is *only* in its proper place when about half-an-inch of the stem is visible outside the drawer front, and the whole of the bulb and a little of the stem are visible inside, and in this position it should always be kept except when it is drawn out for examination. Only draw it out far enough to see the end of the thread of mercury when reading the temperature.

63. The Incubator may now be left for an hour, when the temperature of the water should be again observed, simply to ascertain that it is getting hotter; should it be getting colder the flame must be turned higher. An excess of heat is of no consequence, for as soon as the drawer reaches 100°, or thereabout, the damper will be raised automatically, and all the surplus heat will escape. The flame should be turned to such a height that there shall always be a surplus of heat.

64. For the first six hours the temperature should be taken frequently by both thermometers, and always noted, but not necessarily on the register until you begin actual work, as in the meantime a slip of paper will suffice. At the end of six hours or less the drawer will have reached a steady temperature of 100° or thereabout; and the tank thermometer will register a temperature between 120° and 160°. (See paragraph 553 G.) Beginners are particularly requested to fill up their register sheet, and to send it on to Regent Street if the result is not satisfactory.

The use of the sliding weight.

65. When the damper has risen, the sliding weight may be brought into use, and it will be found that by moving it to the right the damper will be held down on the chimney, and more force will be required to raise it; consequently the water and drawer will increase in temperature. Moving the weight of a No. 6 Incubator two inches makes a difference

of about one degree in the drawer, and it is better to move it one inch at a time, at short intervals, than to shift it over a long distance of, say, four inches at once. The distance the weight requires to be moved to make a variation of one degree is less in the smaller incubators and more in the larger. When the drawer thermometer registers a proper hatching temperature, (see paragraph 89), clamp the lead weight to the lever by means of the milled-head screw which goes through it.

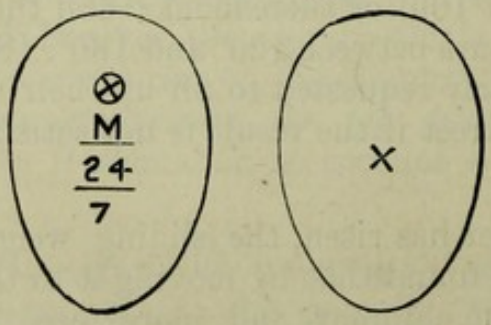
66. It will be found that after having once adjusted the heat in the drawer it will remain constant notwithstanding considerable changes in the external temperature. The greatest variation likely to happen without re-adjustment is only 3° in a twelvemonth. Nevertheless, if for any purpose of experiment it is desired to maintain a perfectly uniform temperature, this can easily be achieved by moving the lever weight to the right or left, according to the indications of the thermometer in the egg drawer. Whenever you open the drawer for any purpose, *note the temperature before doing so.* Keep the thermometer always in the paper tube, and *only draw it far enough out to read the scale.* It is very little use to take notice of the reading of this thermometer unless the drawer has been closed for at least three hours previously. Examine the thermometer from time to time and see that the thread of quicksilver is not disconnected at any point. Should a portion of the thread have become detached, hold the thermometer vertically and strike the palm of your hand with the bulb. This will cause it to unite. Very sensitive thermometers, like those sent with our apparatus, are liable to become deranged when used in a horizontal position, owing to the capillarity of the glass tube.

Age of eggs for hatching.

67. It is, perhaps, hardly necessary to remark that only fresh eggs should be used for hatching—those over a week old should be rejected.

68. In winter take care to collect eggs intended for hatching soon after the hens leave the nests, and remove them to a place where they cannot get frozen. Store them on clean straw or on a rack, and allow the air free access to them. Misshapen eggs, or eggs with rough granular shells should be rejected.

Obverse and Reverse Side of Egg, showing the Method of Marking.



Marking the eggs.

69. On one side of each egg mark with blacklead pencil the day and number of the month; thus, for January 4th, write $\frac{4}{1}$, fourth of the first

month ; March 20th, write $\frac{2}{3}^{0}$, twentieth of the third, and so on, the date so marked being the day of the month on which the eggs are severally put into the drawer ; and if you have purchased the eggs at different places, it is as well to put the first letter of the person's name also, which will enable you to keep an account against vendors of unfertile or stale eggs.

70. On the reverse side of the egg put an X.

71. Having made yourself conversant with the action of the Incubator, and being satisfied that it is working correctly, you may put the eggs in, a few at a time if desired, or all together if you prefer to do so.

72. We think that it is less trouble to bring up forty or fifty chickens of one age than to have them of all ages.

Turning the eggs.

73. Turn the eggs upside down twice a day, and during the first week leave the drawer open every morning for ten minutes to cool them, inclusive of the time it takes to turn them. Gradually increase the time of exposure to twenty minutes a day, until the eggs chip, after which arrange the chipped sides uppermost, and discontinue the turning and cooling. In cold or frosty weather expose only for half the time mentioned above.

Position of embryo

74. In turning the eggs, arrange that the date shall be uppermost at night, and in removing an egg from the drawer for the purpose of testing, keep that side toward you, as the embryo will be floating at the top, and so be more easily seen.

Testing the eggs.

75. Test the eggs on the 7th or 8th, and again on the 14th or 15th day. For this purpose one of our testing lanterns or an ordinary paraffin lamp may be used. The latter should be enclosed in a wooden box without a lid, and having a hole about three inches in diameter cut out of one side directly opposite the flame.

76. The egg tester, having been fitted with a diaphram suitable in size to the eggs to be operated upon, should be held in the operator's left hand between the light and the operator's eye, so that the egg which is held between the fore-finger and thumb of the right hand close to the egg tester intercepts the light ; the whole of the contents will now be clearly seen.

Appearances of fertile and unfertile eggs.

77. Those eggs which are decidedly fertile will be found to have a dark patch in the centre, and a number of red streaks running in various directions radially, giving the embryo the appearance of a spider with long legs.

78. An unfertile egg has the same appearance as a new-laid one.

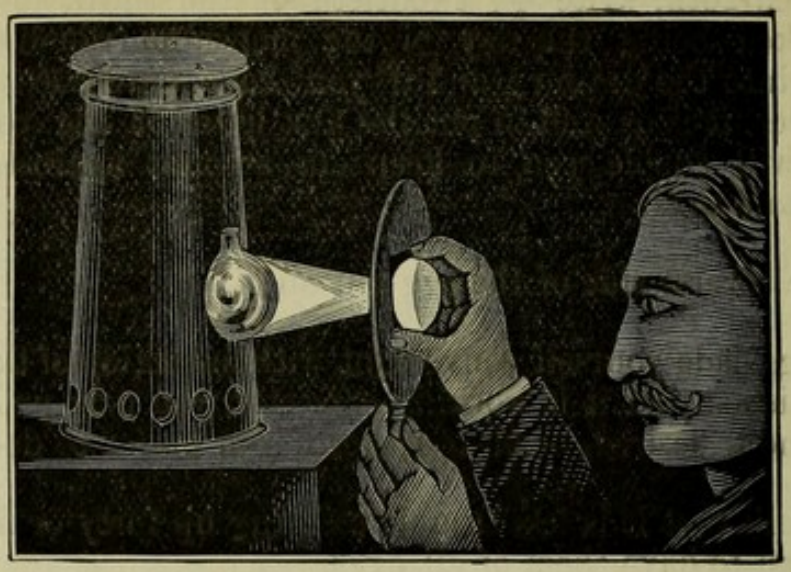


Illustration showing method of testing eggs.

Appearances of broken yoke and addled eggs.

79. An addled egg is distinguished by a dark spot adhering to the shell and a cloudy ill-defined appearance generally ; and an egg in which the yoke is broken (and in which only a feeble attempt at germination has taken place) will generally be found to have a blood-red line attached to the shell at that side which has lain uppermost.

80. Mark in pencil on those removed from the drawer the words "addled," "broken yoke," or "un-fertile," directly after having examined them, and at your leisure break them and see whether your judgment agrees with the condition of the contents ; you will thus gain confidence in distinguishing the goods eggs from the bad ones.

81. A very little experience, aided by the coloured illustrations on the cover of this book, will put the operator in possession of more knowledge on this subject than the most elaborate explanation.

82. A distinctive mark or letter may be put on those which are decidedly fertile ; a good plan being to put a little circle, thus, O, and on testing again on the 14th day, if they are found to be progressing favourably, an X may be put in the middle of the circle as a reminder that they have been tested the second time.

83. By marking the eggs in this way a few of them may be tested at a time, and you will avoid keeping the drawer open too long at one examination. When you are not certain, mark the egg doubtful, and put it in the drawer again.

A use for unfertile eggs.

84. Eggs decidedly unfertile are quite good for culinary purposes ; but if you feel any hesitation in using them in that way, put them aside for the young chickens ; you will find that they are not so fastidious as the *genus homo*.

85. If the above instructions have been carried out, the shells will chip not later than the 20th day, and the chick will leave the shell unassisted in from twelve to eighteen hours after the first appearance of the bill. As soon as the eggs are chipped, read the chapter on the treatment of young chickens.

86. Should a shell be chipped on the lower side it should be turned to the top as soon as it is observed. Caution.

87. Beginners at artificial incubation are always in a hurry to help the chickens out. This is a mistake. The only assistance permissible is to clear away any of the shell or lining should it impede the breathing, or to help a chicken out if it does not show evident signs of leaving the shell eighteen hours after having broken it.

88. It sometimes happens that a chicken will break the shell at the small end. When this happens some assistance is generally needed, as the chick finds more difficulty in getting out at that end than at the other. The head should be presented at or near the large end of the shell.

89. The best temperature for hatching most eggs is 104° when the temperature of the room is 60° ; but if the room be hotter or colder than this, the Incubator should be adjusted in accordance with the following table : Best hatching temperature.

When the room stands at :	50°,	60°	70°,	80°,
keep the incubator drawer as nearly as you can at	105°,	104°,	103°,	102°,

The eggs of wading birds and waterfowl may be hatched along with hens' eggs, but generally speaking they do better incubated alone, and at temperatures 2° below the corresponding ones given for hens' eggs in the table. *Incubation should not be carried on in a room the temperature of which falls below 45°.*

If the chickens come out on the 21st day you may rest assured that the mean temperature has been satisfactory, but if they come too soon or too late you may be equally assured that your drawer temperature has been too high or too low. A variation of one degree one day above and another below the temperature fixed upon will not affect the general result, but if a fall or a rise lasts for more than three days the weight should be moved a little to correct it.

The times of incubation for eggs are as follows :

	Days.		Days.		Days.
Ostrich	42	Goose	28	Duck	28
Emu	42	Turkey	28	Pheasant	24
Swan	42	Pea Fowl	28	Hen	21
		Guinea Fowl ...	28		

90. In the 200-egg Incubator a difficulty is sometimes experienced in keeping both drawers at the desired temperature, the right-hand drawer being generally half to one degree hotter than the other. If, however, the eggs are much more advanced in the left-hand drawer, that will under such circumstances be found to be hotter than the right-hand one.

Such slight variations are not, perhaps, of much consequence, but as we consider it desirable to be able to control the relative temperatures, we have devised a very simple arrangement to enable us to do so.

On the left-hand side of the Incubator will be seen a brass knob attached to a rod just like a bell-pull. When starting the Incubator, this rod should be pulled out just half as far as it will go, or about three inches. The Incubator should now be started according to the instructions, and until a steady temperature is arrived at, note taken of the right-hand drawer only. When the right-hand drawer is steady at the desired temperature, examine the thermometer in the left-hand side, and should it be a little lower than the other, push the rod in until both drawers are alike. Should the left-hand drawer be hotter than the other the rod must be drawn out to lower the temperature. In pushing the rod in or drawing it out, do so by small stages of half-an-inch at a time at half-hourly intervals.

The two drawers having been thus adjusted, the equalising slide will not require any further attention, provided the eggs are equally distributed in the two drawers. No attempt should be made to equalise the drawers, unless they have both been shut for at least six hours previously.

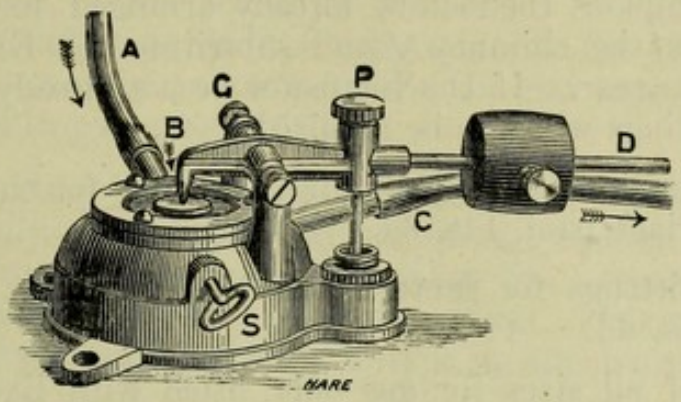
TABLE SHOWING APPROXIMATE CONSUMPTION OF GAS, OIL AND WATER IN INCUBATORS.

Distinctive Numbers of Incubators	1	2	6	11	20	35	45
Gallons of water required to fill Tank	¾	1	3	7½	16	7½	16
Consumption of Oil in Pints per week	3	4	6	8	10	9	12
Consumption of Coal Gas in cubic feet per week...	100	130	200	220	280	240	300
Ditto if fitted with Excelsior Valve	75	110	150	170	200	180	220

SPECIAL NOTICE.

When corresponding respecting your Incubator, please always quote ALL the numbers on the top edge of the drawer front, whether they be printed or stamped. If the numbers are obliterated, please give the distinctive number of your Incubator, thus: No. 1, 2, 6, &c.; or if you do not know this, the internal meeasure of the drawer in inches both ways. Enclose also stamped, addressed envelope.

THE EXCELSIOR GAS VALVE.



NAMES OF PARTS.

A Inlet for gas.
C Outlet for Burner.
B to **D** The lever.
G Pivot on which lever works.
P Milled-head screw.
S Screw needle.

In the preceding pages we have explained how a lever, acted upon by a thermostatic capsule, raises a damper from the top of a chimney, and allows the surplus heat to escape. In the "Excelsior Valve" system, the damper is dispensed with, and the iron chimney V (15A), which was previously opened or closed according to the position of the damper, is in this arrangement permanently closed, so that all the heat produced at the burner passes through the flues, and is for the most part utilised.

The opposite end of the lever D is continued to B, and this end is bent downwards, as it is required to operate a novel kind of gas valve, which is difficult to describe, but immediately understood when seen.

It will, therefore, be sufficient to state that when (by the expansion of the capsule in the drawer) the lever D is raised, the end of B is depressed, and the supply of gas thereby cut off; when, on the other hand, the Incubator drawer is opened, the capsule collapses, and the reverse motion of the lever allows the gas to pass freely through the valve to the burner. A "bye-pass" is provided in the same casting, so that whenever the main supply is cut off the flame cannot possibly be extinguished.

The delicacy of this valve must be seen to be believed, and the perfection of the arrangement entitles it to rank as a scientific instrument; nevertheless, the adjustment is so rough-and-ready that no previous knowledge is required to start it.

The action is certain, and with this valve the drawer temperature will not vary two degrees in a twelvemonth, in defiance of external changes in temperature, or variations in gas pressure amounting to double or treble that at which the adjustment was made.

A variation of one-tenth of a degree in the drawer is sufficient to turn the whole supply on or off ; so that under the normal barometric pressure the drawer can be kept at one temperature, to within a degree, from week to week.

In the Champion Incubators already arranged for gas it is only necessary to stop the chimney V and substitute the Excelsior Valve for the ordinary top gear. If the Incubator be not already adapted for gas, a set of gas fittings will also be required.

Price of Excelsior Valve, including a stopper for chimney V, packed and inland carriage paid, 11s. 6d.

Set of gas fitttngs for lantern and 4ft. of rubber tube packed and carriage paid, 5s. 6d.

Incubators of all sizes, for gas only, fitted with Excelsior Valve, are charged at 5s. above the ordinary price.

METHOD OF ADJUSTING THE TEMPERATURE WITH AN EXCELSIOR VALVE.

92. Having as far as possible attended to the instructions previously given for starting a Lamp Incubator, proceed as follows : Take out the egg drawer and push the lead weight quite to the left.

93. Withdraw the bye-pass screw S and the milled-head screw P three or four turns. Turn the gas full on and light it.

94. With one hand lift the lever D as high as it will go comfortably, but without putting a strain on it ; with your other hand turn the screw S in again until the flame is reduced to about the size of a large pea.

95. Release the lever, and as it falls the gas will suddenly rise to its full height.

96. Turn the milled-head screw P in the direction to raise the lever, and continue to do so until the flame is reduced to the same size as it appears when you hold the lever up with your hand.

97. Now give the screw P one half-turn backwards, and the gas will again rise to its full height.

98. Directing your attention to the lantern, reduce the flame to about one-third the size it is capable of burning at, and the apparatus will now complete what you have begun—that is to say, the flame will continue to burn at the height you have set it, until such time as the drawer reaches about 100°. When this is the case the flame will decrease automatically, until it is reduced to that size which shall supply just the amount of heat required to keep the temperature of the drawer at the point at which it was arrested. The adjustment having been thus effected, it must *not* be meddled with for the whole time during which the Incubator is in action.

99. To vary the temperature, or to bring it to a proper heat for hatching, move the lead weight as described in paragraph (65), but do not attempt to alter the temperature by changing the position of any of the screws or gas tap.

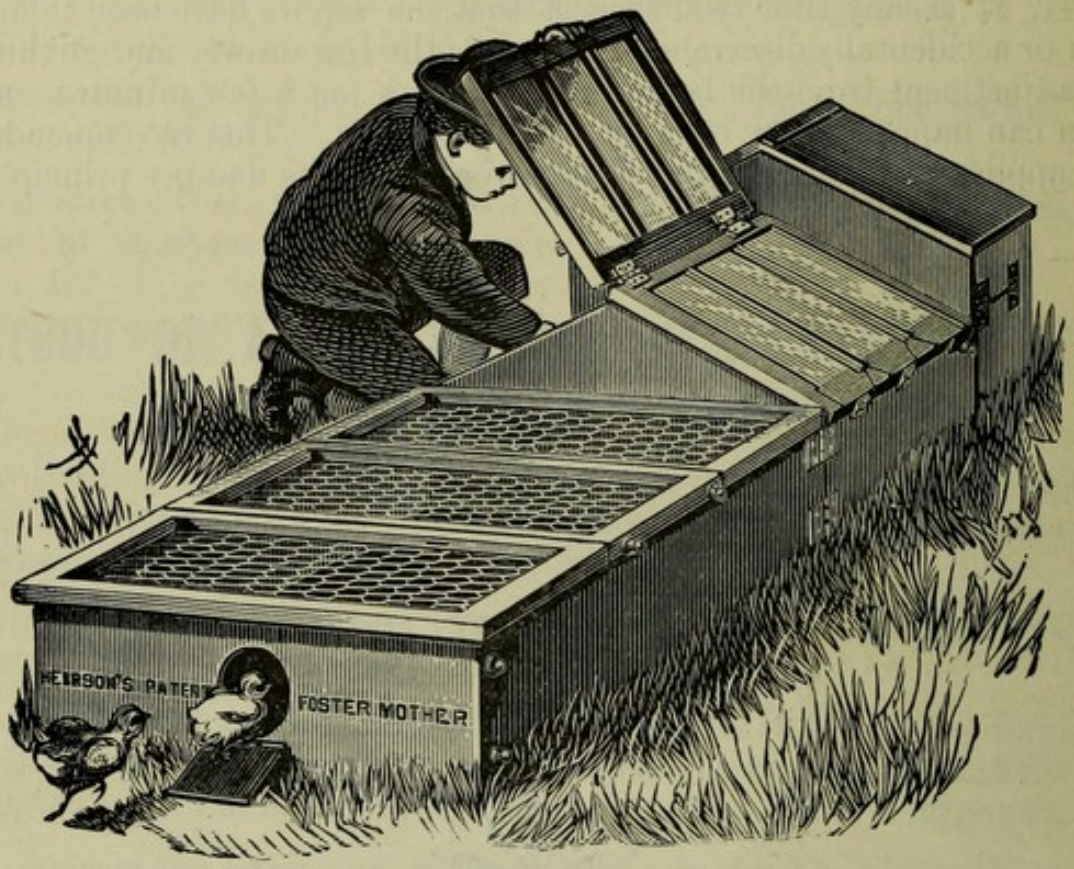
100. If you find in the course of five or six hours that the gas has not been automatically lowered as described, and that the drawer and water are not increasing in temperature, the gas may be turned up as little as described in paragraph (63).

101. If at any time you suspect that the screws have been tampered with or accidentally disarranged, take out the egg drawer and go through the adjustment from the beginning ; it takes but a few minutes, and no harm can happen to the eggs by an extra airing. This recommendation also applies to Champion Incubators worked on the damper principle.

HEARSON'S PATENT

HYDROTHERMIC FOSTER MOTHER:

AN OUTDOOR REARER FOR CHICKENS.



For use in Winter or Summer.

For Prices see Price List following "Answers to Correspondents."

THIS Foster Mother is acknowledged to be the most complete and satisfactory yet offered to the public, and entirely overcomes the difficulties experienced in the use of all previous apparatus of the kind.

102. The Hydrothermic Foster Mother consists of three chambers—viz., a sleeping compartment or dormitory, a glass-covered run, and a wire-covered run. The sleeping compartment is heated by means of a petroleum lamp, which burns in a wind-proof lantern situated at the rear, and which imparts its heat to a copper tank, filled with hot water, which occupies the upper part of the dormitory.

103. The heated products of combustion from the lamp are conveyed to the water by a circulating flue in the tank in the same way as the heat is applied in the Champion Incubator.

104. Openings are provided in the sleeping compartment, giving access to the glass-covered run, and, more effectually to graduate the temperature and to provide against undue loss of heat from one chamber to the other, flannel curtains are hung around a kind of colonnade, and through this the chickens have to pass in going from one chamber to another.

105. A tube at the ridge of the roof of the sleeping compartment is provided for filling the tank with hot water, and an overflow tube placed under one of the eaves indicates when the tank is full enough.

106. At the back of the sleeping compartment, on the right-hand side of the lantern, is a screw plug or cock for emptying the tank when it is desired to do so.

107. The floor of the sleeping compartment is of wood, and is removable. Access to the interior is obtained by opening the doors at the ends of the sleeping compartment, and the floor can be taken out at either end. When both doors are open the space is quite clear from floor to ceiling, and can be swept right through.

108. Ventilation is provided between the sleeping compartment and glass run, and the heat which thus escapes into the latter so modifies the temperature of that chamber that the chickens are quite at ease there in the coldest weather.

109. The glass run is also provided with a movable wood floor in two parts, one-half of which should be taken out when the chickens are three or four days old.

110. The glass used in the roof of this compartment is secured without putty, and can all be taken out and replaced in a few minutes.

111. At that end of the glass run furthest from the sleeping compartment comes the wire run, and in this the chickens are fully exposed to the air.

112. One fixed and two hinged frames covered with wire netting protect the chickens from birds of prey, and also prevent the chickens from getting out. The hinged frames give easy access to the interior.

113. Openings closeable by doors enable the operator to confine the chickens to the glass or to the wire run as may be desired.

114. The whole apparatus can be taken apart and put together without the use of workmen's tools, and occupies the least possible space when packed up.

115. Properly speaking, the foster mothers which the above-described apparatus has now completely superseded belong to ancient history ; but as these old types have a tendency to crop up in the correspondence columns of the press and elsewhere, and are generally brought forward by

persons who have no practical experience, we think it well to caution our readers against making or purchasing foster mothers which are (*a*) heated by boiling water added at intervals; (*b*) by hot water the temperature of which has to be increased at intervals by means of a large lamp burning in a lantern NOT WIND-PROOF; (*c*) by a lamp burning in the SAME chamber with the chickens, however plausible may seem the arrangements for getting rid of the products of combustion.

116. We cannot spare the time nor the space to enter into the objections to all these systems, nor to the objections against any of the makeshift arrrangements substituted for them; it will suffice to remind you of the cry prevalent in the old days of artificial incubation, when everybody knew that they could be hatched, but that they could not be raised.

117. Those days are now passed, and with the approved appliances at your disposal you can not only hatch a larger percentage than was formerly possible, but rear them with the same certainty that you can hatch them.

INSTRUCTIONS FOR PUTTING THE FOSTER MOTHER TOGETHER AND WORKING IT.

118. Select a spot of bare ground (167) *out of doors*, as nearly level as possible, or, in severe winter weather, under the shelter of an open shed, which must not, however, have a wood floor.

119. Place the sleeping compartment in the position you wish it to occupy, arrange the other parts so that the numbers correspond, fasten all together with the screw-eyes provided, placing under each screw-head one of the iron washers.

120. For tightening up the screw-eyes use a piece of stout wire, or a large nail, or a blacklead pencil.

121. Fix the lantern in its place by means of the buttons.

122. Slide the glass into the sash frames and secure it by means of the buttons on the lower edge of the frame.

123. Fill the glass balls with water, also the pans in which they are to stand. Now invert each glass ball quickly, and drop its neck into the tube provided for it in the pan.

124. As the water is used up air will enter the ball, and the water in the pan will be kept at a uniform height so long as there is any in the glass ball.

125. Drop the loose bottoms which form the floor of the glass run into their places, and sprinkle them with dry earth or dry road-grit. If the Foster Mother be on a stone or brick pavement sprinkle that also thickly with the same material.

126. Fill the copper tank with boiling water at the tube in the ridge of the roof of the sleeping compartment until the surplus runs out at the overflow under the eave, and every two or three weeks add a little more to replace that lost by evaporation.

127. Fill the lamp with kerosene, *i.e.*, American petroleum, and light it.

128. Take care not to leave the wick above the cones. Its proper position is slightly below the level of the inner cone (187), and as a precaution against the formation of soot, turn it low when first lighted, as the size of the flame will increase after it has been burning a few minutes.

129. To familiarise yourself with the behaviour of the chimneyless burners used in all our Foster Mothers, you will do well to have the lamp alight indoors for half an hour before you put it into practical work. You will observe that the shape of the flame changes after it has been burning a few minutes, and that it attains its maximum size for any particular height of cotton in about ten minutes after it has been lighted.

130. Knowing this you will have no difficulty in settling on the proper height for the wick when lighting it in the lantern.

131. To facilitate the adjustment of the flame, and to avoid stooping to see how it burns, a small mirror is attached to the inside of the door of the lantern in such a position that as you stand and look into it the flame is seen inverted.

132. In trimming the wick take care not to allow the charred ends cut off to fall into the space under the cone. This is a fruitful source of accident with oil lamps of all kinds, whether for use in the house, in Incubators, or in Foster Mothers.

133. When a thermometer raised 3-in. from the floor of the sleeping compartment registers 75 deg. to 80 deg. the heat is sufficient in summer weather, but in winter the sleeping compartment for the first week should be kept as warm as the lamp will make it.

134. As the chickens get fledged the temperature may be lowered, and in three weeks to a month, according to the weather and the strength of the birds, they may be tranferred to a cold brooder, and later on to a poultry-house.

135. In very hot weather the sashes of the glass run may be raised an inch for ventilation, but at other times the door-ways leading from one part to another will be found sufficient.

136. Should the ground on which the Foster Mother is placed be very uneven, it is desirable to bank up the earth to prevent the entrance of vermin, and at night the doors leading to the open run should be closed for the same reason.

137. The bottom of the sleeping compartment should be removed at least once a week, and when returned to its place it ought to have about an inch of dry earth, hay, chaff, winnowings, or peat-moss laid on it, partly to keep the chickens off the bare boards, but more particularly to absord the moisture from their droppings.

138. Move the apparatus to new ground at least once a week, and before shifting it extinguish the lamp and remove it from the lantern.

139. Thermometers are not sent with Foster Mothers because the temperature can be determined approximately without one. A warm hand represents a temperature of about 96 deg., and a heat somewhere about this is satisfactory.

140. To empty the water tanks of Nos. 0, 3, and 7, unscrew the brass cap by the lantern, and in the larger sizes turn the brass cock. If by any chance you require to clean the flues (555B) replace the crumpled copper wire, in the left hand flue, as the heat from the lamp is more effectually utilised by the water when this wire is in the flue.

THE TREATMENT OF YOUNG CHICKENS.

141. We purposely refrained from giving instructions on this head in first editions, because we thought that our Incubators would pass exclusively into the hands of poultry-breeders and others with some experience in rearing young birds. It is, however, an agreeable surprise to find that artificial incubation, as presented in the "Champion," is not confined to any particular class, but that hundreds who never thought of keeping fowls before, and many others who have no convenience for bringing them to maturity, have not been proof against the fascination offered by our apparatus, and pursue this study successfully under the most disadvantageous circumstances.

142. To such, then, the following chapter is addressed, with the acknowledgment that the deductions we make are derived from the accumulated experiences of our customers, as well as from our own observations and practice. We trust, therefore, that others who are more advanced will not consider us presumptuous, but help us where we fail, so that in future editions this chapter may better merit the title.

143. The chipping of the shells about twelve hours before the actual emergence will give you ample notice what to expect the next time you go to the drawer, and instead of opening it only far enough to see all the eggs, you will do well to pull it quite out, because when it begins to open, the stronger chickens run away from the light, and occasionally jump over the back of the drawer.

144. Any chick which may be found in the stage illustrated on the back of the cover of this pamphlet should be left for the next visit ; but all the chickens which are fairly out of their shells should be transferred to the drying-box, the zinc tray of which you will have previously littered with hay, peat moss or other absorbent material. When only a few birds are in the drying-box, the lid may be quite closed ; but if you have a great many at one time, you will require to raise the glass from $\frac{1}{2}$ to $\frac{3}{4}$ of an inch, at discretion, to admit more air than would pass in or out at the ventilating holes. To moderate the light in this apparatus, and prevent loss of heat by radiation, cover a part of the glass with a piece of flannel or any old rag which comes to hand.

145. In about three or four hours the chickens will have dried off and assumed their downy appearance.

146. Those who have Incubators without drying-boxes will find a basket lined with hay placed before the fire a tolerable substitute, but it will be advisable to see the cat shut up before this expedient is resorted to.

147. You will now probably be advised to remove the little horn on the upper bill, but we recommend you to leave it alone for a week, when, if you look for it, you will find nature has saved you trouble and the chicken some annoyance, if not actual pain.

148. Carefully eschew the use of felt as a feeding-ground for young chickens, as also any corner of a yard in which carpets are beaten.

149. The loss of a great many chickens has been traced by us to their having swallowed, along with their food, the fragments of hair and wool derived from these fabrics, and in one case a whole brood was lost through their being fed for the first time on a piece of cow-hair boiler felt. In all these a compact mass of cow-hair completely stopped the entrance to the gizzard, and the birds died of starvation, notwithstanding that their crops were full of food.

150. When chickens are coming out, the drawer may be opened every six hours, or even oftener, if there be much excitement in it, and by then removing the fully hatched ones, those which are not quite ready will remain quietly in their shells, instead of struggling out before their time. The drawer should be closed again as soon as possible.

151. We have not thought it necessary to trace what has been going on inside the egg during the whole time of incubation, but as the absorption of the yolk, which takes place within the last twenty-four hours, affects the chickens in the early stages of their active life, it will relieve you of unnecessary anxiety for the welfare of your charge to know that at the time of getting out of the shell a chick contains nearly all the yolk of the egg from which (with this exception) it has been formed, and it will not, therefore, require any food until the greater portion of this has been assimilated.

152. The uselessness, therefore, of cramming young birds of any kind with food as soon as they are able to stand is obvious, and a period of at least twelve hours should elapse before any attempt is made to thrust a meal upon them.

153. When it is considered that their appetites are established, the following composition, some hard-boiled egg and bread crumb, or our "Eureka" mixed with hot water may be given them.

154. Take any number of fresh eggs (or the unfertile ones rejected on the 7th day), and beat them together with their shells ; put the mixture into an old saucepan or frying-pan over the fire, and add thereto a tenth

of its weight of fresh lard or dripping. Stir briskly with an iron spoon or a piece of wood until the whole coagulates. Mix the resulting granular omelette with twice its weight of bread crumbs in a large basin, and rub gently between your hands until the larger lumps disappear. This compound has not the adhesive qualities of hard-boiled egg and bread crumb, and the presence of fat favours its disintegration. A sprinkling of bird sand or a little fine gravel may also be added to this food in about the same proportion as salt is used for culinary purposes.

155. All birds require some gritty material to enable their gizzards to perform their functions properly, and as we have found some people trying to rear their chickens on the tiled floor of their conservatory without any sand, gravel, or like substance, we mention it in this connection that the importance of it may not be lost sight of.

156. When this food is offered the chickens they will generally commence to eat with avidity, but whether they do so or not, they should be transferred to the Foster Mother, within the first 24 hours, and placed in the sleeping compartment, which, at the time, should be as nearly as possible at the same temperature as the drying-box. This should always be done in the early part of the day, so that you may have an opportunity of seeing all day how they get on. To start an apparatus of which you have no experience at night, and then go to bed, is to court failure. Should the weather be very cold and the number of chickens small, the floor of the dormitory may be covered with litter to the depth of one, two or three inches ; the chickens will be thus brought nearer to the source of heat.

157. During the whole time of incubation you will have maintained a regular temperature in the egg drawer ; and if the apparatus has been properly worked and in good order, you will have found this very easy. It must not, however, be supposed that all care is at an end, and that by merely transferring the chickens to the Foster Mother to do as they like, you will succeed in rearing them.

158. Your great enemies are now cold and wet, and your success in rearing the young broods lies between yourself and the elements, always supposing that you have provided yourself with one of *our* Foster Mothers.

159. In warm and sunny weather, with the thermometer at or over 60°, your success will be assured, but with the thermometer between 40° and 50° considerable care is needed ; and when the outside air is below this, no pains should be spared to bank up the earth and keep up the internal temperature.

160. At night an old sack or a piece of matting thrown over the glass run will prevent the radiation of a vast amount of heat, and if a small portion be left uncovered, sufficient light will be admitted to enable the chickens to take their morning meal before you are up.

161. We cannot too strongly impress upon the amateur the absolute necessity of warmth, and no better index of what is requisite can be taken than the behaviour of the chickens themselves. If they spend most of their time moping in the sleeping compartment, it shows that the air inside the glass is too cold, or that the sleeping compartment is not hot enough to refresh them after they have been in the glass run.

162. In such a case, rather than do things by halves and be in doubt which is required, do both—that is to say, throw a cloth over a part of the glass, and turn the lamp a little higher.

163. In very cold weather they will often remain in the sleeping compartment for an hour together; but in summer a warm up of ten minutes or a quarter of an hour sets them on their feet again, and when the sun is shining they will bask in its rays without going into the heated chamber at all, so that the temperature of this may be lowered during the day, and increased towards night, if economy in oil be a consideration.

164. In hatching, an excess of heat is the *bête noire* of the operator; but after the chickens leave the drying-box you need have no fear of their getting overheated, for as soon as they are comfortably warm they will move towards the door or out under the glass.

165. The difference of temperature between the sleeping compartment and the glass run when the external air is below 40° will be considerable, unless the glass be partly covered with a mat or sacking, and the doors leading to the wire run be closed; but by taking these precautions for the first week or ten days, the risk of their catching cold will be reduced to a minimum. Nevertheless, every gleam of sunshine should be taken advantage of, and if a warm interval in an otherwise cold day should turn up, the chickens should be allowed into the wire run as long as the sunshine lasts. It is well to bear in mind that fowls are only acclimatised in this country, and that the young are to all intents and purposes tropical birds, requiring to be hardened off with the same care which a gardener bestows on the early plants which he has been nursing in a hot-house during the winter months. But, as we have already pointed out, if the weather be warm, and there be no chance of a frost, you may dispense with all extra precautions. To prevent them moping, and to keep them employed, suspend a piece of cooked flesh of any kind from the wire frames, so that it hangs about three or four inches from the ground.

166. In setting up the Foster Mother, select, if possible, a south-west aspect, and if a sheltered spot can be found facing in that direction so much the better, for the cry which is sometimes raised against the east winds is not without some reason, for we have noted that the glass run is much colder when the air is stirring than during calm weather, the external air being in each case at the same temperature.

167. The desirability of keeping fowls as much as possible on the bare ground during waking hours has been frequently pointed out in works on poultry, and this applies more particularly to chickens. From some cause, not at present satisfactorily accounted for, they nearly all get affected with a disease of the legs if kept on a wood floor, and we have found, also, that covering the floor with an inch or two of earth has not prevented the appearance of the disease. We have made several attempts to get at a reason for this leg weakness, and are inclined to think, from our experiments, that however necessary it may be to keep their backs warm, this condition is not an absolute necessity for their feet, which may be subjected to a considerable amount of cold, not only without inconvenience, but to positive advantage, provided the ground on which they stand be dry. A puddle of water will, however, work considerable mischief in cold weather, and should be studiously avoided.

168. You will do well, therefore, when the weather compels you to confine a young brood to the glass run, to remove one or both of the loose boards under the glass, and scatter a little short straw or hay over a portion of the surface thus exposed, so that the chickens can choose between it and the ground.

169. It is also a good plan to strew some grits or bread crumbs with the litter thus provided, as the search for these will afford them great amusement.

170. The disposition to scratch and hunt their own food begins almost as soon as they begin to peck, and the exertion which this induces is highly beneficial to them. Poultry are naturally scavengers—nothing comes amiss to them—and the same may be said of their young after the first two or three days.

171. All the kitchen refuse—farinaceous, animal, and vegetable—they will devour greedily, either cooked or raw ; but these should be chopped into morsels proportionate to their swallowing capabilities. To these may be added rice, either raw or boiled, oatmeal, Indian meal or barley meal ; and last, but not least, Hearson's "Eureka" Poultry Food. Nor should the addition of chopped grass or clover, of which they are very fond, or in its place either chopped lettuce, onions, or watercress be omitted.

172. The great art of bringing chickens rapidly to perfection lies in keeping their crops well supplied with food, and to this end they may be fed every two hours during the day for the first week if they succeed in emptying the feeding troughs in the meantime. The waste of food which happens when it is thrown on the ground is entirely obviated by the use of our feeding troughs, as the wire guards prevent them from scattering what remains when their crops are full. A change of food is also highly desirable from one meal to another. If they be fed constantly on one kind they are soon surfeited, and will only eat of it at night or early in the morning, when their hunger compels them to take something. In

the absence of insect food, a small quantity of our "Polysarc" mixed with the "Eureka" every two or three days for the first three weeks will be found beneficial.

173. The softer kinds of food should be given in the day-time only, and the last meal at night should be a farinaceous one, in the form of dry rice, grits, buckwheat, barley, or Indian corn, crushed or whole, in proportion to the ages of the chickens. One of these crushed or in powder made into a paste, or some of our "Eureka" Poultry Food soaked in warm water, should be placed in the feeding troughs the last thing at night, and left under the glass, so that when they rise in the morning, which they will do as soon as daylight appears, they may have the means of satisfying their hunger.

174. If your efforts are directed to raising winter or spring chickens it will be necessary for you to feed them long after sundown by the light of a lamp, or the fast of the long winter night will be highly prejudicial to their health, and perhaps undermine their strength altogether. A supply of clear fresh water at frequent intervals is also essential to their well-being. The globes and water trays should be thoroughly rinsed with clean water every time they are filled, and the latter may be scalded with boiling water once a week. At the end of three weeks, in temperate or warm weather, the chickens will be sufficiently advanced to do without artificial heat; but to accustom them to the change it will be well to diminish the heat in the sleeping compartment as the chickens get older, preparatory to doing away with it altogether, or to removing them to make room for a second brood.

175. When they are considered strong enough they may be transferred to a warm poultry house, in which you will provide them with one of our Cold Brooders.

176. The chickens should be put into this every night until they learn to retire to it in the same way they have been used to do in the Foster Mother. The heat generated by their bodies will be sufficient to keep them warm.

177. In the same house, and near or over this Cold Brooder, you should fix parallel perches, each ranging higher than the last as the wall is approached, so that the chickens can easily hop from one to the other. In a little time they will roost on these, and after this they may be trusted to take care of themselves.

178. The amateur's principal difficulty will be found in January and February, when frost and snow claim nature for their own; but a southern aspect, a sheltered position, plenty of heat, warm food occasionally, and a fair amount of attention will enable even the tyro to succeed.

179. In about ten weeks the cockerels should be divided from the pullets, or interminable conflicts between the former will work havoc

with their plumage, besides retarding their growth. If all the cockerels be kept in one pen their chivalry disappears, and they may be easily fattened off.

180. As a rule, the male birds may be distinguished by their large combs; but where this index fails, the sex will manifest itself by the frequent challenges which will take place so long as two males remain in the same pen with the pullets.

181. All our previous remarks apply with eqnal force to young turkeys, which are even more susceptible to cold and wet than chickens. Under the same treatment, but with a larger percentage of animal food ("Polysarc"—see Index), they will do quite as well as under their natural parents.

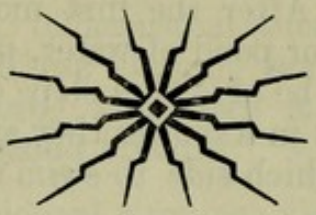
182. Ducklings are perhaps more easily reared than either of the foregoing. They are much more hardy, and therefore do not require so much nursing. Give them only as much water as the drinking fountains will hold two or three times a day, and a shallow tray of water every two or three days to paddle in whilst you are looking on. They grow faster, and keep in much better health by being so treated, instead of being allowed to spend the greater part of their time in the water, as they will do if left to themselves. After the first month in mild weather, they may have a shallow vessel or pond of water, preferably only breast high, the margin of which must be of such a slope that they can get out of it on all sides. When caught in a shower they appear to lose their presence of mind, and forgetting which side to swim to, make vain efforts to get out where it is impossible.

183. We have known ducklings a week old to be drowned in a common pie dish not two inches deep, after a heavy shower, and on one occasion lost some in a soup plate, in consequence of the side being too smooth for their feet to take hold of. A heavy shower is therefore to be guarded against, whilst a drizzly rain may, no doubt, be "fine weather," as the adage runs, "for young ducks." In case they get wet on the back, or affected with cramp, to which they are very liable when in this condition, dry them off as quickly as possible. If one of them be very far gone, put it into a bath of warm water, temperature 90° to 100°, and keep the bath at that heat until the bird revives, which will be in a few minutes. If your Incubator be still working, put it into the drying-box, and the bird will soon come round again; but in default of this, wrap it in flannel and put in a warm corner by the fire. We have found ducklings of all ages treated in this way revive miraculously when life has been apparently extinct.

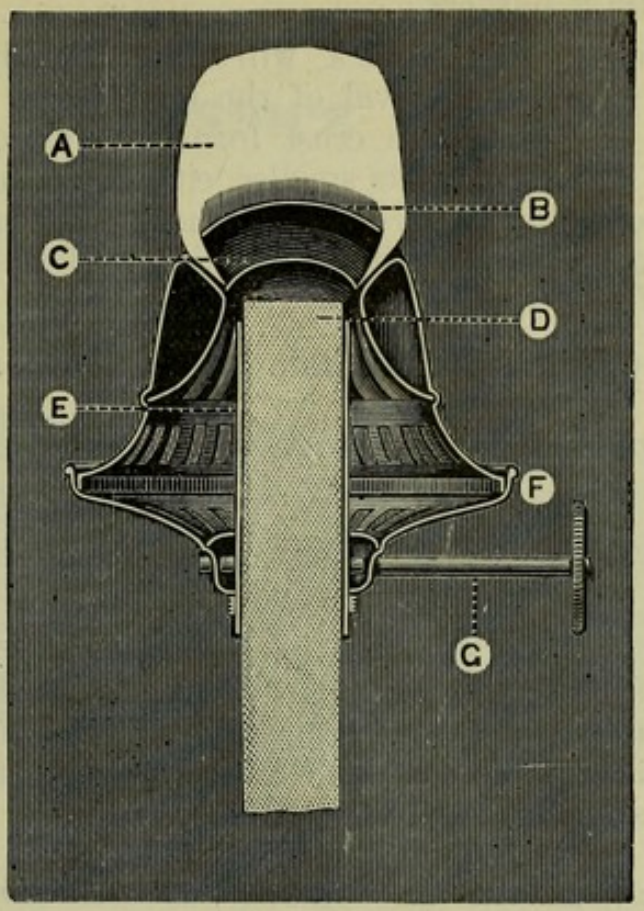
184. Ducklings and chickens must be kept in separate Foster Mothers, otherwise the chickens will get cramp from the puddles which are the delight of their web-footed comrades.

185. Wild ducklings are still more hardy, but there is sometimes a difficulty in getting them to feed themselves. Just lately several customers write that they have succeeded by sprinkling the food on their backs, in which case they peck at it without any further inducement. The habit once acquired, they feed with the same avidity and on the same food as the domestic varieties.

186. Another customer tells us he finds that by putting young pheasants, or other birds which do not at once pick up their food, with chickens, they learn from the example of the chickens to feed themselves.



FOSTER MOTHER BURNER.



187. The above is a sectional view of the burner supplied with Hearson's Patent Foster Mothers.

A.—The flame.

B.—The outer cone.

C.—The inner cone.

D.—The wick, the top of which should (when the oil is good and the lamp properly trimmed) always be somewhere between the inner cone and the top of the wick case E.

E.—Wick case, which extends some distance up towards the inner cone and down to the reservoir.

F.—The junction between the upper and lower half of the burner.

G.—The winder, for raising or lowering the wick.

188. As these burners differ considerably from all those in domestic use worked with glass chimneys, we offer a short explanation, and advise you to try the lamp in a room before placing it in the Foster Mother. The illustration shows the shape and proportionate size of the flame when the lamp is properly trimmed. We include under the head of trimming, the filling of the lamp with a suitable mineral oil. Most of the mineral oils imported from America burn well in this lamp, as also in all our lamps ; and if customers will insist on having oil of standard qnality, it is always to be had at a reasonable price.

189. Ask for **kerosene** oil, not paraffin oil. Paraffin is not the correct name of any of the oils prepared in America. Paraffin oil does not burn well in these burners.

If you get the right oil the wick will last for nearly a week without further trimming than the removal of the slight crust which forms on the top of it. If a considerable crust forms the oil contains resinous or tarry matter ; if the flame gets smaller, either at once or after burning a short time, or refuses to be turned up without smoking, the oil is too heavy (that is, it weighs too much per gallon, and is consequently too thick) or is of inferior quality.

If you have any difficulty in obtaining good oil we shall be glad to supply you with the best quality (in barrels of 40 gallons only) at reasonable prices, according to the state of the market. Quotation on application.

190. To keep the burner clean, occasionally remove the upper from the lower half by separating them at the junction F.

Before putting a new wick into the burner it is desirable to dry it thoroughly by baking or ironing it with a hot iron, and having inserted it at the upper end of the wick case, wind it down into the reservoir (555A), and see that it gets at once oiled from one end to the other ; otherwise it will absorb moisture from the air.

191. Take care to prevent the accidental introduction of water to the reservoir, and if at any time you suspect the wick to be wet, take it out and dry it afresh. A wick saturated with water will cause the flame to behave in the same way as it does with oil which is too heavy.

The flame in the illustration is the best possible after repeated trials. It is not necessary, however, to turn the flame so high, nor to be particular as to the form of the flame, so long as there is no smoke.

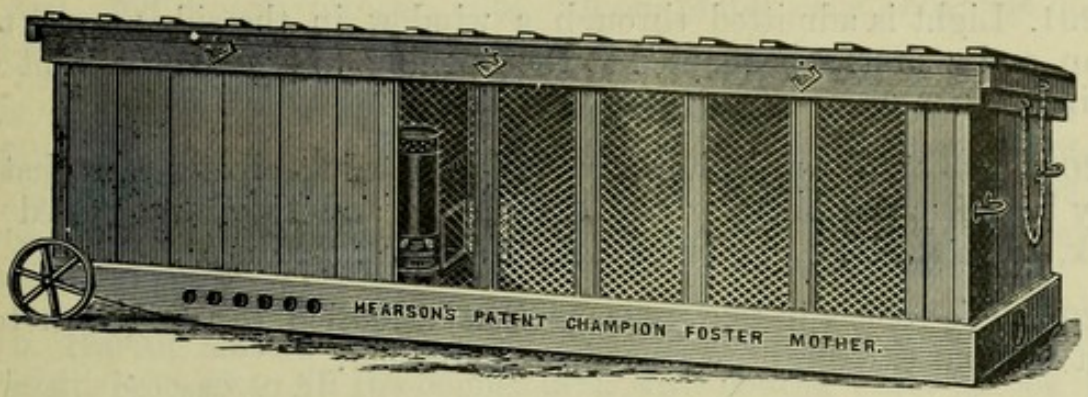
192. When supplying new burners to replace damaged or old ones, we always send a screw collar to fit the new burner, and if the one on the lamp reservoir does not fit the burner, it must be unsoldered and the new collar soldered on in its place. Any tinplate worker will do this while you wait. If more convenient, the lamp reservoir may be sent by parcel post to our Works, and we will do it at a small charge and return it immediately to your address, which should always be enclosed in the same parcel with the goods.

Occasionally two burners will fit the same collar, but the manufacturer will not guarantee to make them interchangeable.

Many of the remarks referring to wick, oil, and trimming refer equally to the burners used in our Incubators.

HEARSON'S PATENT

CHAMPION FOSTER MOTHER.



Made in one size only, for 50 chickens, measuring about 6ft. 6in., by 2ft 6in., and 26in. high; complete with Wind-proof Lamp, 2 Feeding Troughs and 2 Drinking Fountains.

Price £5 5s. 0d.

(For Hydrothermic Foster Mother see paragraph 102.)

194. The Foster Mother illustrated above is divided into two chambers, viz., an outer run and an inner dormitory.

195. The run has a wired front, inside which is a supplementary glazing, the glass being removable a pane at a time, as desired, to suit all weathers.

196. The dormitory is raised a few inches above the ground, and the chickens obtain access to it by an inclined plane. Internally the dormitory is divisible at pleasure into two parts, according to the weather or the temperature desired.

197. In the inner and warmer portion is situated a copper water tank which is heated by a petroleum lamp, the flame of which is actually in the outer run.

198. Nearly the whole of the convective heat of the lamp is transferred to the water tank, and this effectually heats the dormitory. The remainder of the heat serves (when the outer run is glazed) to raise the temperature of it several degrees above the outer air, which is very desirable in extremely cold weather.

199. Fresh air is supplied to the dormitory by a ventilating shaft, which goes through the hot water tank, thus only warm pure air is admitted, and all draught is avoided.

200. The walls of this chamber are made of a double layer of wood, and there is a double roof to prevent loss of heat in that direction.

201. Light is admitted through a window in the side nearest to the lamp, and a shutter is adapted to the opening to exclude the light when desired.

202. The outer run is, however, fully lighted at all times, so that food may be left overnight for the early birds, and they may be fed after dark, when the long nights necessitate such a procedure.

203. The roof is in two parts, so that attention can be given to one part without exposing the other in wet weather.

204. The handles at one end and the wheels at the other enable the Foster Mother to be shifted by one person to new ground with perfect ease.

205. The only advantage of this Foster Mother over our own Hydrothermic lies in the ease with which it can be shifted to new grounnd, but this advantage only holds good when we compare it with the three larger sizes of the latter, as the smaller sizes are easily shifted without taking any of the parts asunder.

206. It is important to remember that the Champion Foster Mother is not so warm as our Hydrothemic and that it is not therefore suitable for rearing when the air is below 40° Faht.

The Hydrothermic Foster Mother is the only rearer which will raise chickens out of doors in Winter weather, and we hereby warn the public against unscrupulous dealers who make imitations of our apparatus which are useless for the purpose for which they are sold.

INSTRUCTIONS FOR WORKING HEARSON'S PATENT CHAMPION FOSTER MOTHER.

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208. On receipt of the Foster Mother remove the screws which secure the roof, and knock off the slips which protect the underside of the wood-work.

209. Under the roof of the sleeping compartment will be found the paraffin lamp, two chimneys, two feeding troughs, two drinking fountains and a screwed cap for the emptying tube. In a frame in the wire run will be found the five panes of glass, which slip into the grooves behind the wire netting.

210. Having ascertained that the Foster Mother has not been damaged in transit, proceed to fill the copper tank with boiling water at the hole uncovered by removing the screw plug near the ventilating shaft inside the sleeping chamber, until the surplus runs out at the overflow tube. Every two or three weeks add more water to replace that lost by evaporation.

211. Fill the lamp with American petroleum or kerosene, and put on one of the glass chimneys.

212. To get the lamp into its place under the lantern, pass your forefinger through the looped handle, press the thumb-piece as far down as it will go, slide the lamp into the opening under the lantern, release the thumb-piece, and you should now find that the chimney fits closely all round the under-side of the lantern.

213. Care should be taken to ascertain that it does so fit, otherwise the flame can be blown out in a high wind when the roof of the outer run is raised.

214. To see whether the glass chimney is properly in contact with the underside of the lantern make use of the mirror. When it is desired to remove the lamp take care to press the thumb-piece of the lamp quite down before attempting to withdraw it.

215. Please note that the lamp (when turned to its full height) is capable of maintaining the dormitory 60° above the temperature of the outside air, and that, in warm weather the flame need not be raised more than about half the height at which it can be made to burn, but in cold weather you will want all the heat you can safely get.

216. To light the wick when the wind is high, press the thumb-piece and withdraw the lamp far enough to insert a match. If this be done before the first flash of the phosphorus composition is exhausted it will be found quite easy to light the lamp in a gale of wind, but it must be returned immediately to its position under the lantern.

217. No amount of wind will blow the lamp out, so if it should go out you must look for some other cause.

218. If you have any trouble with the lamp read paragraphs 127 to 133 and 187 to 192 of "The Problem Solved."

219. At night the wire run will be lighted up so that every corner of it can be seen perfectly, and when it is desired to see inside the sleeping compartment, or to feed the chickens at night, the inner lid must be raised and the shutter which keeps the light out must be withdrawn. At all other times this shutter should be closed.

220. To clean the bottom of the sleeping compartment take hold of the rings in the floor and pull the boards quite out.

221. To shift the Foster Mother from one place to another first drive the chickens into the sleeping compartment and secure them there by closing the door. Now take hold of the handles at the end furthest from the wheels, and you will find that you can shift it with ease as far as you may desire. At all other times keep this door open.

222. If the ground is very uneven you will need to level it where the Foster Mother rests to prevent the entrance of vermin or the exit of chickens.

223. To clean the flues of the copper tank, remove the lamp, turn the buttons on either side of the lantern and remove it, at first from the bottom and afterwards from the top. When you have it off note carefully the construction, and the little difficulty you found in getting it off will disappear next time. When the lantern is off pull the knob which is thus uncovered and draw the septum of the flue quite out. Brush out the open flues or mop them out with a cloth tied on a stick. Replace the septum horizontally, with the asbestos pad of the septum downwards and refix the lantern.

224. Take note that to refix it you first hook the upper part over the chimney, then drop it a little ; next slide the upper edge of it behind the iron plate at the top ; now raise it a little and get it to slip over the two pins below the buttons ; turn the buttons to hold the flange and the lantern is refixed.

225. If the flame is not turned too high, and the oil is good, the flues will hardly ever require cleaning.

226. The lamp will not burn unless the water in the tank is warm. If therefore, the tank does not feel warm to the touch, the water must be run off at the lower or emptying tube, and the tank refilled with hot water.

227. In cold weather all the glass should be inserted behind the wire netting, but in summer the whole of the glass may be taken out and packed away in the frame or pocket made to hold it when not in use.

229. Unless the ground is tolerably even the lamp must be taken out when the Foster Mother is being shifted.

230. The bare ground of a courtyard is better than a grass lawn or field, but if you desire to use the Foster Mother on grass land it will be as good as a courtyard if you give the birds a handful of road grit once or twice a week.

231. If you find any difficulty in working the Foster Mother, and cannot see your way out of it after having read paragraphs 102 to 192 of "The Problem Solved," write, enclosing stamped addressed envelope, to THE SECRETARY.

ANSWERS TO CORRESPONDENTS.

At various times since the appearance of our first edition the following enquiries have been put to us, and as they may contain seasonable information for other readers, we print them with our replies, to extend their utility. To make this chapter as complete as possible, we have added some queries of our own, and answered them in the same breath. To facilitate reference we have made the two last figures of each paragraph correspond with those in the instructions.

551. Is a conservatory a good place to work an Incubator in ?

No. Because it frequently happens that the variations of temperature there are greater than in an ordinary room.

Select preferably a quiet, unfrequented room or outhouse, and in every case make arrangements for plenty of fresh air.

551A. May the Incubator be placed near a window ?

It is desirable to place it where it can get plenty of air, but not in such a position that the wind can blow in at one side and out at the other.

552. Why must the egg drawer always be taken out before attempting to adjust the lever ?

Because when the drawer is in you cannot be sure that the capsule is in a flattened condition, and any adjustment you may make will not be reliable; but when the drawer is out the capsule is sure to go quite flat in a few seconds. And if you now adjust the damper to rest on the chimney (by turning the milled-head screw), you will be certain that it will begin to rise just as soon as the capsule begins to expand.

553. Why does the water hiss and bubble out all round the funnel when I attempt to fill the tank ?

Because you have omitted to take the cap off the overflow tube. The air tries to get out as you put the water in, hence the commotion.

553A. I started the Incubator according to your instructions, and 10 minutes after I put the drawer in the damper began to rise ; in 20 minutes it stood four inches above the end of the chimney, but after about an hour it settled down to within an eighth of an inch from the top of the chimney. Why did it behave in this manner ? I may mention that the drawer went up to 110°, but eventually settled at 90°. The temperature of the water now stands at 112° ; the air here is 80° in the shade.

Our instructions were not written for tropical countries. It is fortunate that you did not put the water in much hotter, or you might have injured the capsule. "All's well that ends well." Your experience will perhaps prevent a like occurence. When the temperature of the air is above 70° the water may be put in at 110° instead of 120°.

553B. Why not start the Incubator with cold water?

You can do so if you like. It will only be a little longer in coming to the required temperature.

553C. I have seen thermometers with an expansion chamber at the top, so that if you put them into boiling water they will not break. Why do you not use these?

Because it frequently happens that part of the quicksilver gets into the expansion chamber you speak of, and is then very difficult to get out again. A globule nearly invisible to the naked eye left there would make the thermometer read several degrees less than the correct temperature.

553D. Should the water tank be emptied at the end of the season?

It is desirable to do so.

553E. How is the tank emptied?

Remove the cap of the overflow and of the emptying tube, and draw off all the water which will run; now tilt the Incubator considerably, keeping the corner from which you are drawing off lowest, and all except about a teaspoonful will run out.

Put the caps in the egg drawer, leaving the tubes open so that the air may pass through freely, and dry the interior.

553F. Would it not be a good plan to light the lamp, and so dry off the inside?

By no means! The heat of the lamp flame would soon unsolder the joints when there is not enough water in the tank to cover the flues. If you empty the tank before the water with which you have been working the Incubator has cooled, the heat left will be sufficient to dry it off.

553G. A misapprehension of the Register Copies (38), (2903), and (see letter to *The Field* at end of book), leads some of our customers to expect that for any given external temperature, say 60°, and a given temperature in the egg drawer, say 104°, the water in the tank should always be of the same temperature, but that this is not so will be obvious by a comparison of the three copies given. These discrepancies arise from several causes. There may be more eggs in the drawer in one case than in the other; the eggs may be in different stages of development; the Incubators may be of different sizes. All or any of these causes are sufficient to account for observed differences of temperature in the water tank amounting to many degrees. We therefore take this opportunity to explain that no attempt should be made to keep the water in the tank at any particular temperature; but that the operator's sole attention should be directed to the drawer thermometer, and the movement of the lead weight on the lever should follow the indications of this thermometer only (as explained in paragraphs 65 and 66).

We occasionally receive the alarming intelligence that the water in an Incubator has suddenly gone up 30° or 40°; this, however, is usually explained by the next post, the customer having in the meantime discovered the tank thermometer to be broken, and the indication therefore erroneous.

554. Will Alexandra oil do for the lamp?

Any good mineral oil will do (189). The danger lies in the use of benzoline, in mistake for petroleum or kerosene. Benzoline will burn in a tea saucer or patty pan without a wick. Petroleum oil and kerosene, or indeed any of the oils which are considered safe, will not do this, but require the help of a cotton to gasify them first. When petroleum oil is very hot, however (say at 150° Fahr.), the vapour will take fire and burn in the same way as the vapour from benzoline.

555. Why does my lamp smoke?

Possibly you have not been careful to see that the glass chimney comes in close contact with the bottom of the lantern flue. A little movement of the lamp, one way or the other, will complete the adjustment and perfect the draught. If you find that all the parts fit accurately, the fault must be in the trimming. Perhaps the perforated screen under the cone of the burner is partly choked with carbonaceous refuse from the wick. Take off the cone and scrub the perforation

with an old tooth-brush. If the perforations are stopped up, the flame does not get enough air to support proper combustion. Have you cut the wick *to the curve named on the label attached to the chimney? If not, do so.* If you do not now succeed, ask your oilman for some American kerosene, of good quality, and insist on having it (189).

555A. Can you suggest any way of preventing the twisting of the wick in the lamp reservoir? Mine gets twisted, and then I cannot turn it up.

Yes. Cut a wick into pieces about eight inches long instead of using a yard of it (as we have known some people do), and before you screw the burner to the reservoir, wind all the wick up out of way. Having screwed the burner on, wind the wick down into the reservoir, and you will have no difficulty in winding it up again as it is consumed.

555B. If you have made smoke enough to line the inside with soot, you must have had the flame a great deal higher than it was required, or it has been burning with long tails.

Take off the lantern and sweep the flues with a suitable flue brush, such as bottle-cleaners use; or if yours is No. 20 or 45 Incubator, an ordinary flue brush will not be found too large.

558. How am I to tell when the wire is in the centre of the button on the capsule? You say that I am to see that it is so and so. I can only feel.

Quite true, there is a little difficulty; but if you hold a lighted taper six or eight inches away from it you will be able to form a pretty good judgment of its position; and if you have a small hand-glass or a scrap of looking-glass and hold that at an angle behind the wire and capsule you will be able to see perfectly. You need not be afraid of smoking the bottom of the tank, as that is of no consequence. Take care, however, not to let the flame get near the capsule.

558A. How is the capsule fixed to the table?

The capsule is only glued to the little suspended table. You can take it out if you like, but we should not recommend you to do so. If you think it has shifted and is not directly below the needle-tube, take the needle out and get an assistant to hold a light in the drawer space above the level of the capsule, and on looking down the tube you ought to see the centre of the button. If you have occasion to take the capsule out, take care not to bend it. You need not fasten it when you put it in again, as it will not slip about so long as the Incubator stands in the same place. We only glue them to keep them in place during transit.

558B. I do not find the damper rise at all. I have tried all the dodges I can think of; there must be something the matter with the capsule. I am afraid you have forgotten to put in the twenty drops of precious what's-its-name.

Every capsule is tested under a pressure of 20 lbs. to the inch for leaks, and afterwards goes through a second careful testing to ascertain that the boiling point is correct, so that such an accident as you name cannot happen. You have probably made a hole in it with the end of the wire. Please take it out and return it at once with 3s. 2d. in stamps, and we will post you another. You omitted to quote the number of your Incubator; had you done this we could have sent you one by return, and thus saved you a post.

558C. When you send the capsule, please explain how I am to put it in.

Take out the egg drawer and water tray, unhang the damper, and lift the free end of the lever as high as it will go; take the needle out of the needle tube. Now take out the old capsule and put the other in place of it. Pass the needle gently down the tube until it rests on the capsule, and before you put the upper end of it into the socket of the milled-head screw P, see that the lower end is in the centre of the button of the capsule, and that the centre of the capsule is directly under the end of the needle-tube. If the needle does not touch the lower end of the needle-tube, you may consider that the capsule is in the centre;

but if you are in doubt, put a light into the drawer space and look down through the needle-tube as explained in (558).

559. Why does my lever work by fits and starts? There is an irregularity of about two degrees from one hour to another; the drawer thermometer registers 102° to 104°, and then back again. With this exception it is fairly regular.

The wire is rubbing hard against the needle-tube for some reason, or else the screws on which the lever works are too tight. Perhaps the capsule is not central, or the end of the wire is not in the button. In either case it may be forced against the side of the tube.

559A. How am I to make the damper stand over the chimney?

Simply straighten the lever-wire if it be bent, or bend it if necessary in the required direction. Use both hands, and do not throw the strain required to bend the wire on the brass frame.

560. I have turned the milled-head screw of my Incubator; I feared terrible consequences, but can see no harm except that the temperature is higher. What have I to fear?

The milled-head screw has not been turned to such an extent as to do any mischief, but three or four turns more might have spoilt the capsule. Take notice when the drawer is out, and you will see that the damper now not only rests on the chimney, but that the lever nearly or quite touches the woodwork when the capsule is flat, so that it has to expand perhaps $\frac{1}{4}$ inch before it can take the damper off the chimney again, whereas, when properly adjusted, it is only blown out about $\frac{1}{35}$ of an inch. When you next turn the eggs, take the drawer out, put the lead weight quite to the left, and re-set the damper so that it rests on the top of the chimney; now put the lead weight to the right again, into the same position which it previously occupied, and in four or five hours, if you go to the drawer, you will probably find the temperature one degree lower than you have recently been working at. If you require it higher move the lead weight to the right, as explained in the instructions (paragraphs 65 and 66).

561. Would it be an improvement to put a piece of flannel or another layer of canvas under the eggs?

Certainly not. We have had equally good results without any canvas at all Those who are working in particularly dry climates or in dry seasons will do wel to leave it out altogether, as in this case more heat will pass to the water tray and consequently more water will be evaporated and the air better charged with moisture.

562. What is the use of taking the temperature of the water after the first day?

It is interesting, from a scientific point of view, to note how the water increases in temperature as the weather gets colder, and *vice versâ*. Also, when all the eggs are put in nearly at one time, it is interesting to trace how, as the life in the eggs gets stronger and stronger, the temperature of the water falls off in a corresponding manner; but from a practical point of view it can only be said to be a second check to the operator in case of any accident to the drawer thermometer; for after having used the Incubator for a week or two you will know the drawer is not far wrong by a glance at the water tank thermometer.

564. With the weight quite to the left my drawer thermometer registers 102°. How is this? Can I remedy it, or must I send the Incubator back? I particularly wanted to experiment at 98°. The number on my egg drawer is 6—105—944.

You need not return the machine; we have sent you a capsule by letter post in exchange. Take the other out and return it packed like the one we have sent. The one we have now sent will give you a temperature of 96°, with the weight to the left, and you will get the temperature you require by moving the lead weight about three inches to the right. P.S.—A temperature of 98° will be of no use to you unless you are cultivating bacteria, in which case you will do better with one of our Biological Incubators (see Index).

564B. There is something wrong with my Incubator, No. 6—100—10487. The drawer temperature with the weight quite to the left is only 83°, and the highest temperature I can get with the weight quite to the right is only 90°. It worked splendidly in Valparaiso, but since we came here I have not been able to do anything with it.

Your trouble arises from the elevation of your city. Quito is about 9000 feet above sea level and that makes a difference of 17° or 18° in the boiling point of a capsule. We don't charge for advice, we leave that to doctors and lawyers. In your case, however, the remittance is opportune, as it just covers the cost of an extra capsule to suit the altered conditions. If all our customers would enclose 10s. 6d. for advice business would be a still greater pleasure. Please take out the present capsule and put the one sent in place of it.

566. I am much puzzled by the registers your print, though they have helped to ease my mind by their similarity to my own experience. I find the drawer does not vary in temperature in the same ratio as does the water. In F. Willan's register (see letter to *The Field* at end of book) you will see that the water was 130° and the room 50° on the 1st of April. The water and room were both the same on the 2nd of May, yet the drawer in one case was 102°, and in the other 105°. How is this accounted for ?

On April 1st the drawer was empty, and the lower part of the thermometer bulb was radiating heat to the drawer bottom and water tray. On May 2nd the solitary chicken taken out the same day had perhaps wandered all round the edge of the drawer until he came in contact with the thermometer, with which he probably made friends, and by having nestled under it helped to keep it warm. It may be explained in another way. The capsule is slightly affected by the pressure of the atmosphere, and if you have access to a register of the readings of a barometer for that month you will probably find that the variations correspond approximately with Mr. Willan's drawer thermometer. One inch of mercury corresponds nearly to two degrees of Fahr. scale. That is why we say that the greatest variation likely to happen is three degrees, corresponding to a change in the mercurial barometer of 1½ inches.

567. Why should the larger end of an egg be kept uppermost when collecting?

We say "keep the large end uppermost" from theoretical considerations only. Probably if they were laid on their sides and turned daily it would be still better. The object is to prevent the embryo from coming in contact with the shell, and getting glued to it by the drying up of albumen between it and the shell. When the large end is uppermost the embryo is in contact with the air space.

571. Is it not possible that cold eggs put into a drawer with hot ones may chill the other eggs ?

In very cold weather, yes : but when the external temperature is over 60° we do not think any harm can arise. We take the precaution to distribute the cold eggs round the edge of the drawer. and when we put a good many cold eggs into a drawer which has already only a few in process, we fold a sheet of newspaper into a band about 1¼ inches wide, and then turn it round the warm eggs like a hoop, to prevent the cold ones coming in actual contact with the others. A strip of felt carpet 1¼ inches wide makes a capital protector for this purpose. The next time you go to the drawer it may be taken out, or if you find any convenience in having the eggs divided in this way you can leave these strips of felt in the whole time.

572. Is it better to fill the drawer at once than to put in eggs as they are laid ?

There is a difference of opinion on this point, but all are agreed that it is better to have a number of chickens of the same age together.

573. Why are eggs to be turned ? Surely a hen does not do this ?

Try for yourself. Set a hen, and every time she gets off the nest mark all the eggs as they lie in it. On the first occasion mark them all 1, on the second mark them

all 2, on the third write 3 on the upper side, always in good blacklead pencil or ink In fourteen days the eggs will be covered with figure marks ; but should one fail to be properly turned, it will probably prove to be addled. We quote the following from Mr. Hearson's letter to *Poultry* of May 16th, 1884 :

"There is much misconception as to the object in view in turning the eggs, and I take this opportunity of pointing out that it is not to warm them all round, as some suppose, but for the purpose of changing the relative position of the embryo in the shell. During the early stages the embryo, which is attached to and forms a part of the upper surface of the yolk, is pressed with some force against the upper inside of the shell, and if the point of contact remains the same for many days or hours together, the albumen in which the whole is floating is gradually forced aside, and in the process of absorption and assimilation which goes on around the embryo, the remaining stratum disappears, and the embryo comes in contact with the shell membrane. When this is the case adhesion takes place slowly or quickly, according as the air around the egg is moist or dry. The result is that the embryo soon dies, and in twenty-four to thirty-six hours a dark spot adhering to the shell, and plainly visible in the egg tester, demonstrates that the egg is addled. If they be not turned, and no moisture be supplied, all the eggs will be so addled about the eighth day, the absence of moisture increasing the tendency which the embryo has to adhere to the shell.

573A. In turning the eggs, should I turn them half round or quarter round ?

This is immaterial. (See answer to question 573). The hen is not particular how she moves them. Sometimes an egg is rolled quite over ; at another it is shifted from the centre to the outside ; at one time one end is up, at another time the other ; occesionally she fails to turn one altogether. Our opinion is that she is only studying her own comfort, and moves them because they fret her when she has been sitting in one position on them for some time.

574. Why should the dates be uppermost at night ?

Because we think that most people will test their eggs at night. If you can darken the incubator-room, and admit the sunlight through a 1-inch hole in the shutter, you will have a capital view of the embryo ; but a lamp in a darkened room will answer all the purpose.

577. I can see at once in the egg tester when an egg is unfertile, and can see the spider in some, but in others I only conclude that they are going on all right because they get more and more opaque.

The light you are using is not strong enough. Get one of our testing lamps, and you will have no difficulty in seeing through the shell. Try also some Aylesbury duck eggs. The shells are very transparent, and the appearance of the embryo six days old is a beautiful sight. Hold the egg tight against the egg tester, and, using the handle as an axis, wriggle the egg and tester first one way and then the other, and you will see the embryo move in a contrary direction inside the shell. This must be done gently, and you must not hold the egg too long in front of a hot lamp flame.

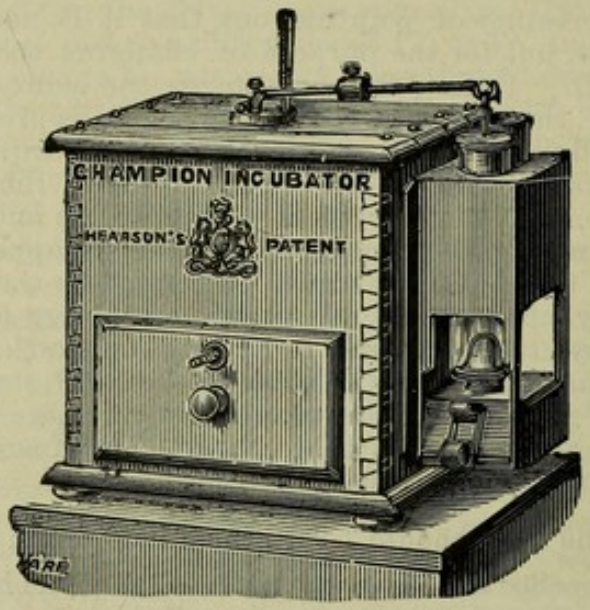
579. What is an addled egg ?

An addled egg is a fertile one which, from some cause, fails to produce a chicken. The fault may have been an original one, or may have been induced by rough usage or defective management. The same may be said of an egg with a broken yolk. In our register sheets we class these under the heading of fertile eggs, and so blame the Incubator for not hatching them.

589. I do not find the times of incubation named in your list correct. All my eggs hatch out sooner than you name. How is this ?

An egg is something like a seed ; it takes a certain time to develop when all the conditions are left to nature ; but if you put one in an Incubator, or the other in a forcing house, you can hurry up the process within certain limits.

CHAMPION INCUBATOR—No. 1.



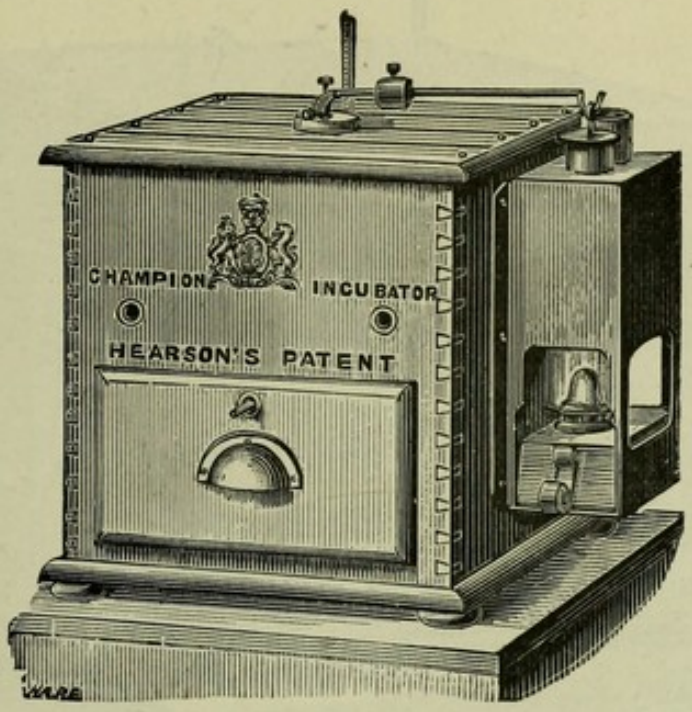
Fitted with our new patent spring-bottom petroleum lamp, and all etceteras requisite for the practice of artificial incubation, including a sensitive drawer thermometer with outside scale; a tank thermometer for taking the temperature of the water; a funnel for filling the tank; one extra lamp chimney; a yard of wick; and egg testers for three sizes of eggs; canvases for the water tray and egg drawer; also a copy of "The Problem Solved," by C. E. Hearson. Inside measure of drawer, 7in. by 7in.; will hold 13 hen or 18 pheasant-eggs. This Incubator has no drying-box, nor is the drawer bottom adjustable, as in larger sizes.

	Inland Price Packed.
Complete, with copper tank	**£2 15 0**

For Export Prices see page 68.

When ordering, please read Notes and Terms on page 2.

CHAMPION INCUBATOR—No. 2.



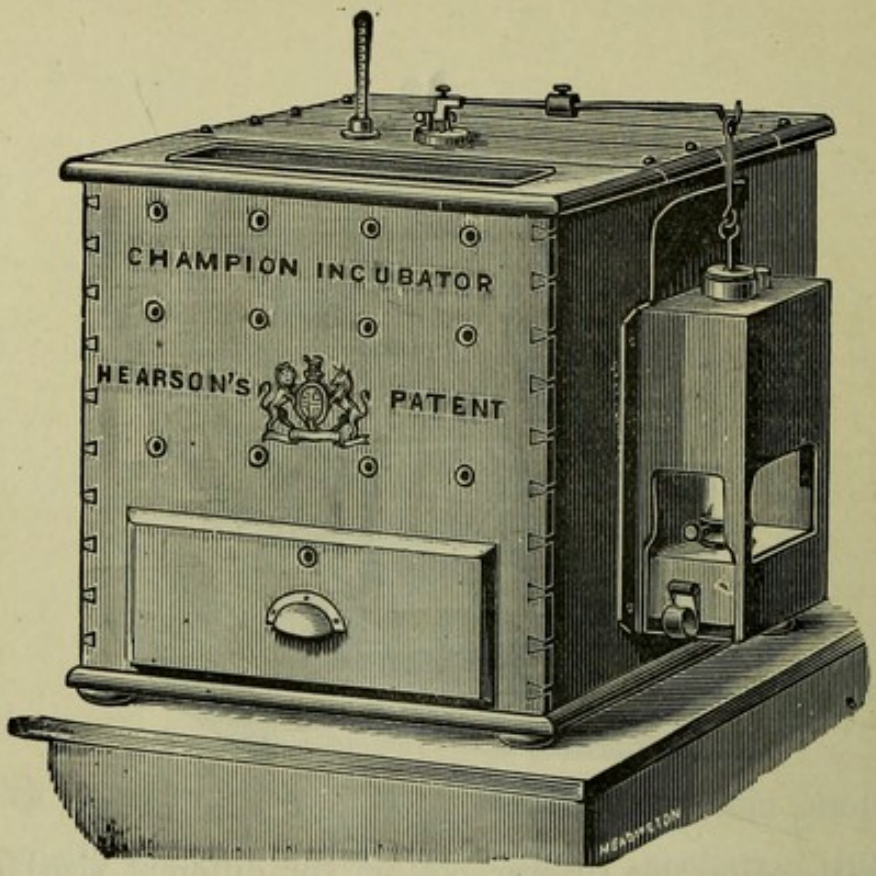
Fitted with adjustable drawer bottom for different sized eggs; also with our new patent spring-bottom petroleum lamp, and all etceteras requisite for the practice of artificial incubation, including a sensitive drawer thermometer with outside scale; a tank thermometer for taking the temperature of the water; a funnel for filling the tank; one extra lamp chimney; a yard of wick; and egg testers for three sizes of eggs; canvases for the water tray and egg drawer; also a copy of "The Problem Solved," by C. E. Hearson. Inside measure of drawer, 10in. by 10in.; will hold 25 hen or 42 pheasant-eggs. This Incubator has no drying-box.

	Inland Price Packed.
Complete, with copper tank	**£4 7 6**

For Export Prices see page 68.

When ordering, please read Notes and Terms on page 2.

CHAMPION INCUBATOR—No. 6.



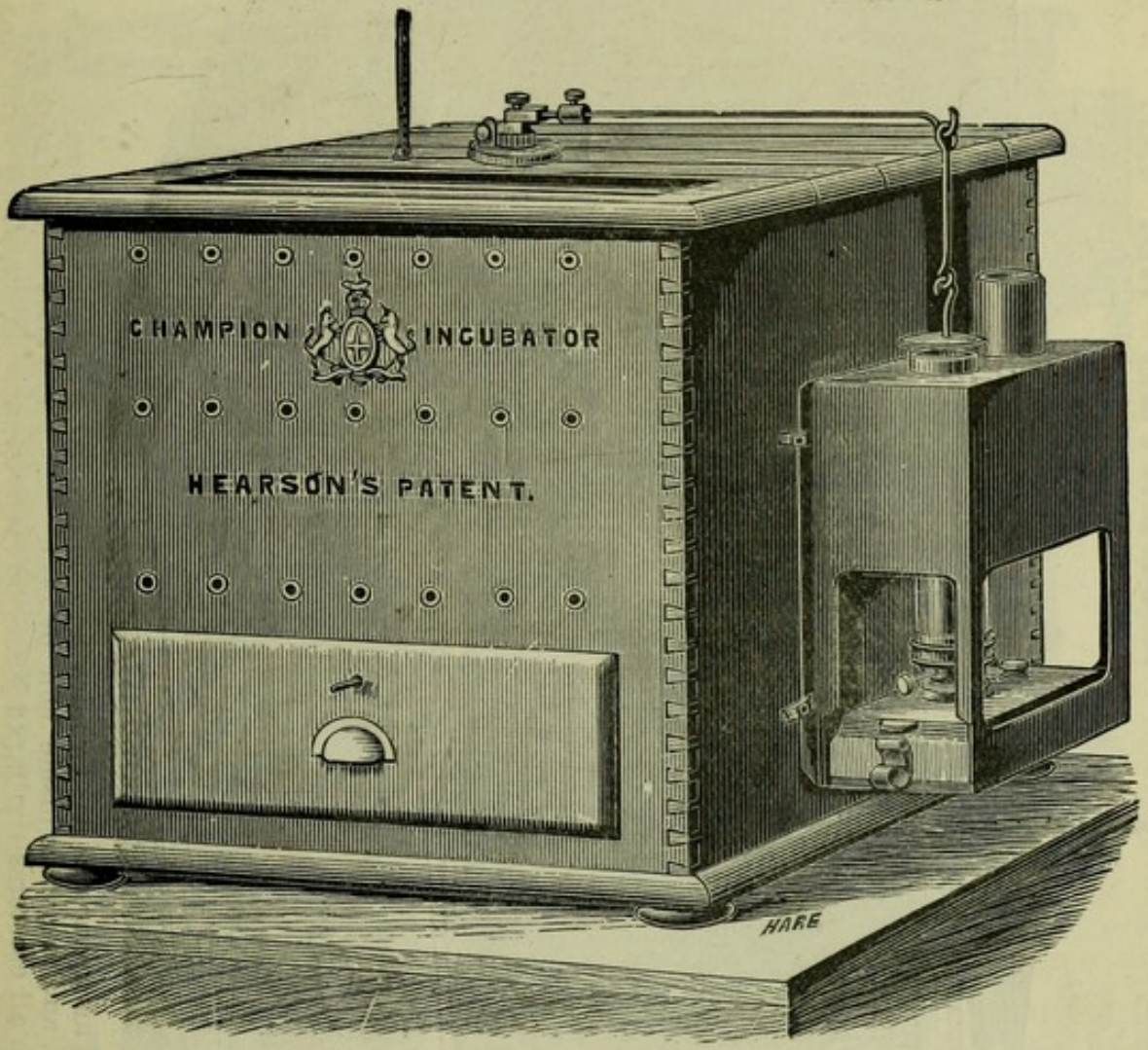
Fitted with glass top drying-box for chickens just hatched; adjustable drawer bottom for different sized eggs; also our new patent spring-bottom petroleum lamp, and all etceteras requisite for the practice of artificial incubation, including a sensitive drawer thermometer with outside scale; a tank thermometer for taking the temperature of the water; a funnel for filling the tank; one extra lamp chimney; a yard of wick; and egg testers for three sizes of eggs; canvases for the water tray and egg drawer; also a copy of "The Problem Solved," by C. E. Hearson. Inside measure of drawer, 14½in. by 14½in.; will hold 50 hen or 90 pheasant-eggs.

	Inland Price Packed.
Complete, with copper tank	**£7 10 0**

For Export Prices see page 68.

When ordering, please read Notes and Terms on page 2.

CHAMPION INCUBATOR—No. 11.



This Incubator is similar in all respects to No. 6, but larger and proportionately stronger built.

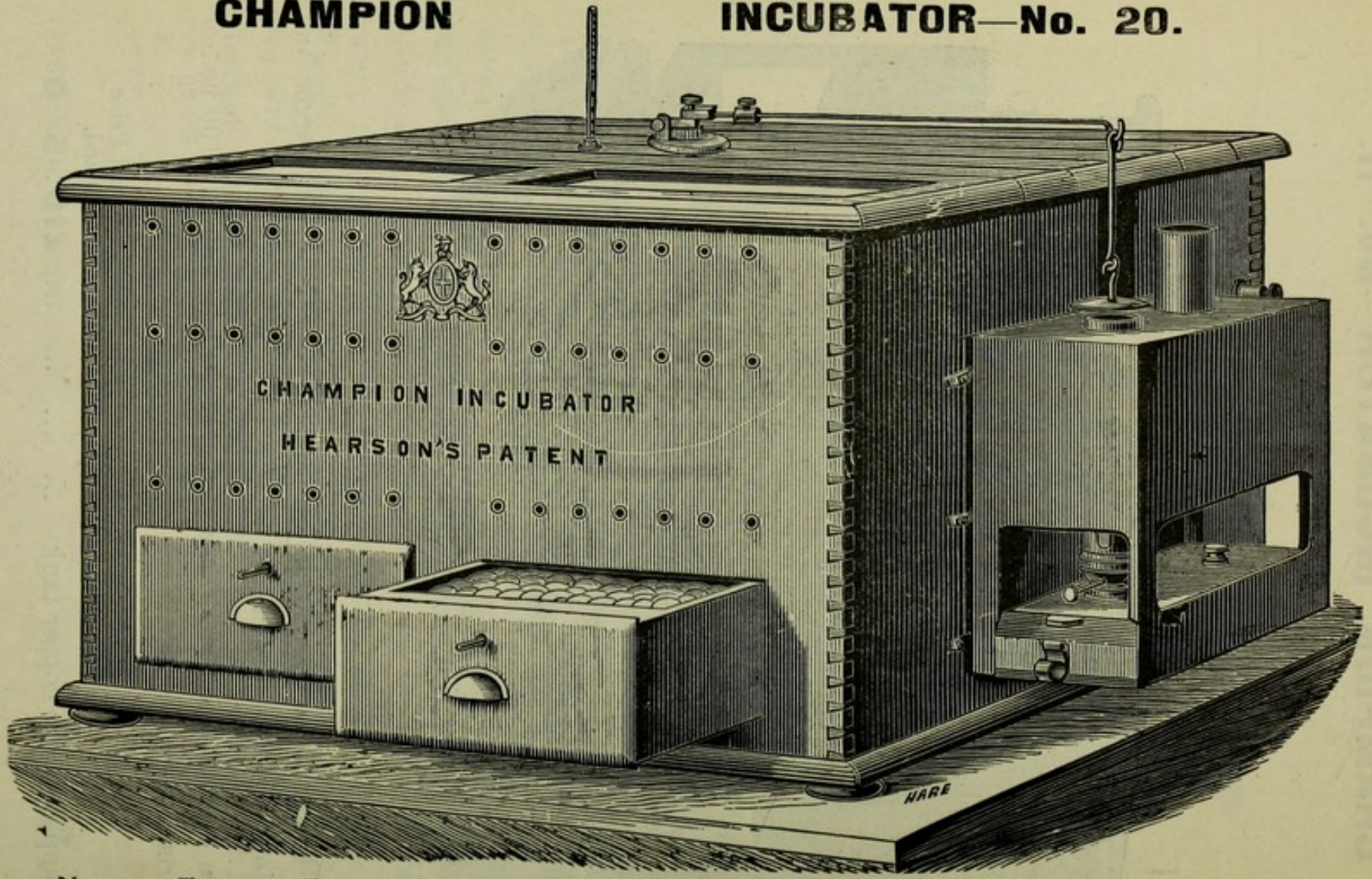
Inside measurement of drawer, 20in. by 20in.; will hold 100 hen or 180 pheasant-eggs.

	Inland Price Packed.
Complete, with copper tank	**£10 5 0**

For Export Prices see page 68.

When ordering, please read Notes and Terms on page 2.

CHAMPION INCUBATOR—No. 20.



No. 20—For 200 Eggs. This apparatus has two drawers, both fitted with thermometers. Each drawer holds 100 hen or 180 pheasant-eggs, and measures inside 30in. by 14in. The upper part is fitted with drying-boxes for chickens just hatched, and with all etceteras similar to No. 6, but is even more substantially built than No. 11.

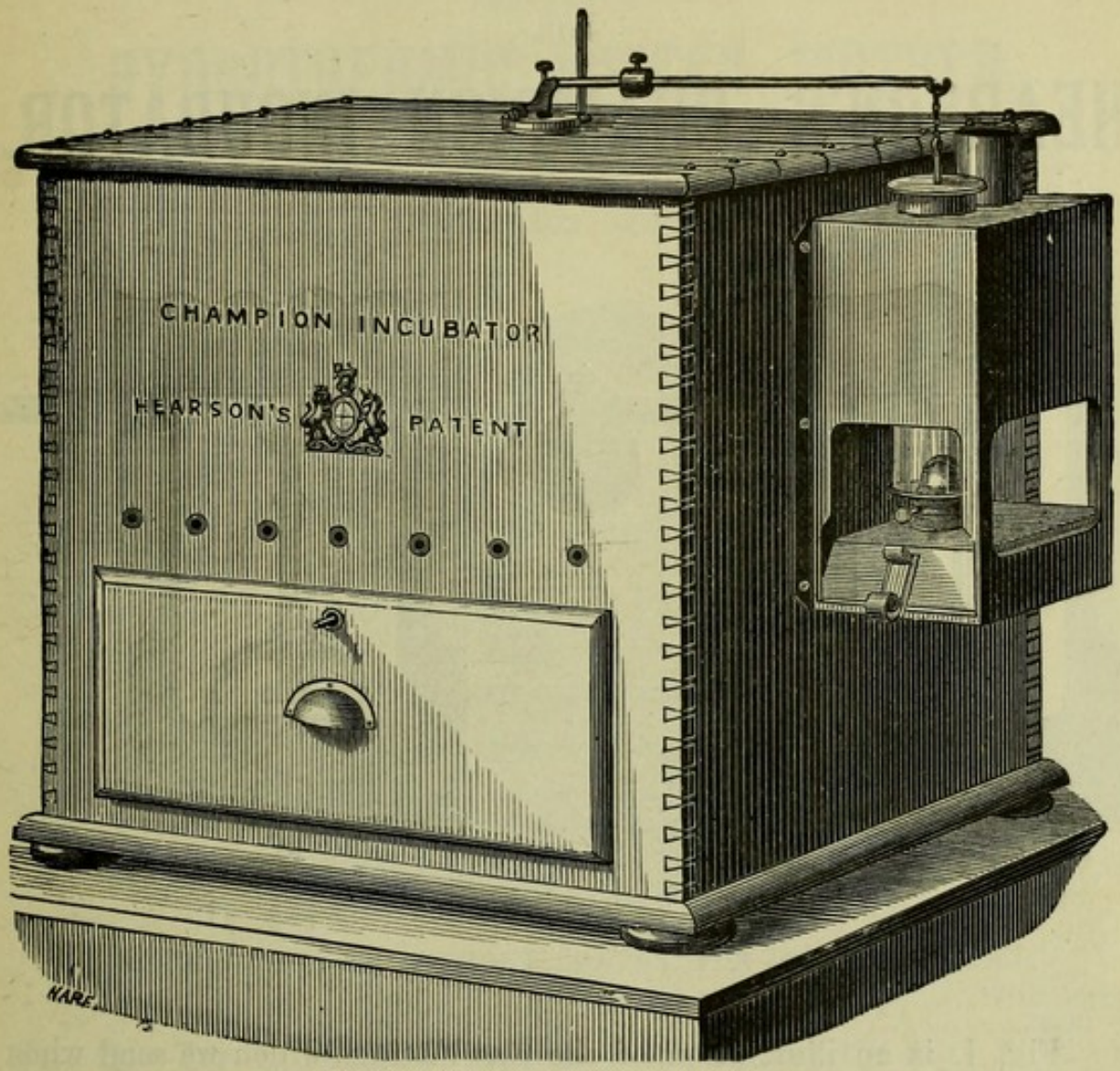
Inland Price Packed.

Complete, with copper tank £16 10 0

For Export Prices see page 68.

When ordering, please read Notes and Terms on page 2.

CHAMPION OSTRICH INCUBATOR—No. 35.



No. 35. Fitted similar to No. 2, but built in the same substantial manner as No. 11.

Inside measurement of drawer, 20in. × 20in.; will hold 12 ostrich or 100 hen eggs.

Complete, with copper tank, Inland Price Packed ... **£10 10 0**

No. 45. Fitted similar to No. 2, but built in the same substantial manner as No. 20.

Inside measurement of drawer, 30in. × 30in.; will hold 30 ostrich or 250 hen eggs.

Complete, with copper tank, Inland Price Packed ... **£17 15 0**

Although especially designed for Ostrich Incubation, any eggs may be hatched in these apparatus by merely packing up the loose drawer bottom until the top of the nearest egg is level with the thermometer bulb. The egg tester sent with ostrich incubators is only useful for poultry eggs.

For Export Prices see page 68.

When ordering, please read Notes and Terms on page 2.

GAS ATTACHMENTS

FOR

HEARSON'S CHAMPION INCUBATOR.

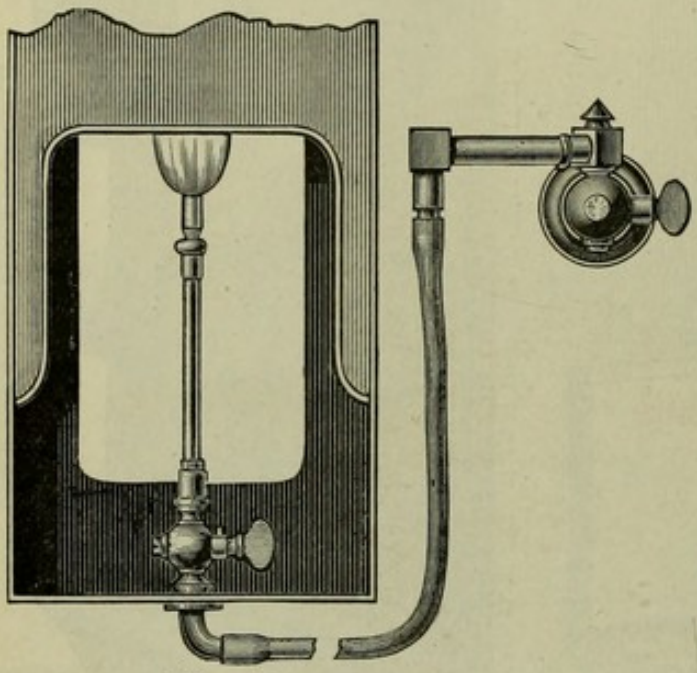


Fig. I.

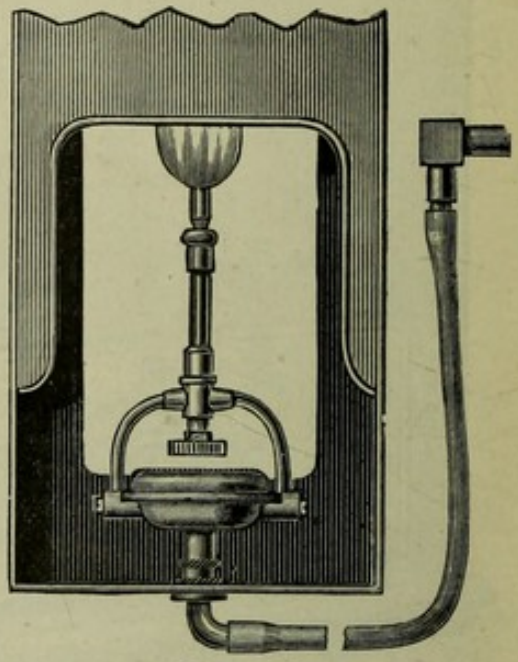


Fig. II.

Fig. I. is an illustration of the Gas Fittings which we send when ordered in lieu of a petroleum lamp. We also supply these separately at **5/6.**

Fig. II. illustrates a modification of our patent Gas Governor, adapted for use with the Champion Incubator, and is supplied complete, as shown, for **10/6.**

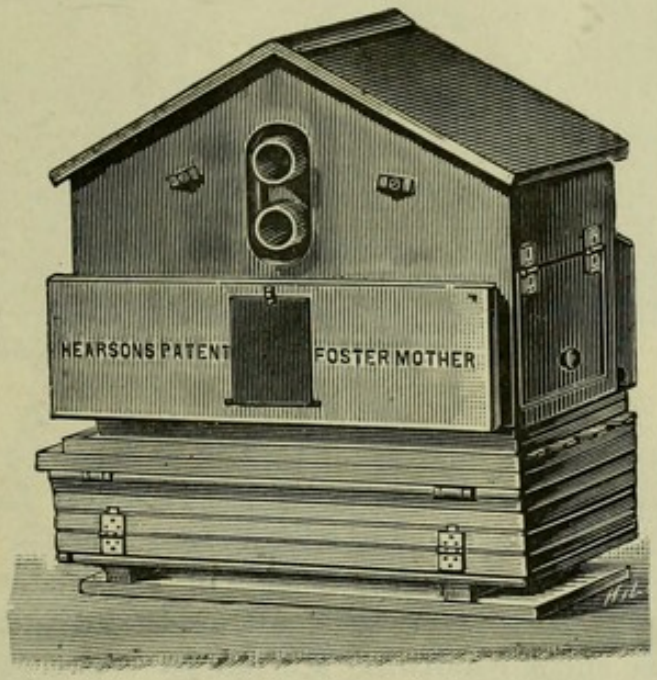
In places where the gas pressure does not vary much, the set of gas fittings shown in Fig. I. will be found to be quite satisfactory, but in situations where there are serious fluctuations in the gas pressure (which may be known by the hissing noise occuring at intervals in ordinary house burners), we recommend the use of Fig. II. The illustrations show how the fittings should be secured to the lantern, and the prices in both cases include 4-feet of rubber tube, and all the fittings up to the Burner. The gas supply in Fig. II. can be adjusted to a great nicety by means of the milled-head screw immediately over the governor, and the action of the latter is such that the size of the flame will never vary.

HEARSON'S

PATENT

HYDROTHERMIC FOSTER MOTHER.

FOR DESCRIPTION SEE PAGE 28.



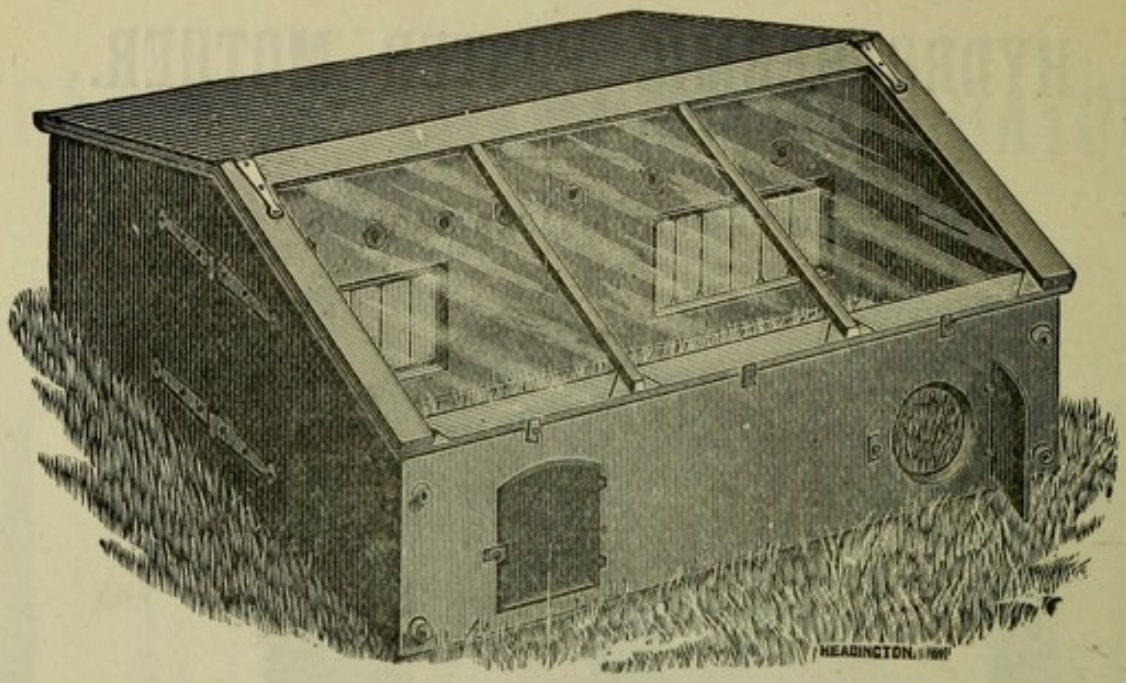
PRICES PACKED, WITHOUT CRATES, FOR INLAND TRANSIT.

	With Copper Tank. £ s. d.
No. 0.—For 13 chickens, measuring 4ft. 6in. by 1ft. 3in., complete, with wind-proof lamp, 1 feeding trough, and 1 drinking fountain	**2 15 0**
No. 3.—For 25 chickens, measuring 5ft. 10in. by 1ft. 8in., complete, with wind-proof lamp, 2 feeding troughs and 2 drinking fountains...	**3 17 6**
No. 7.—For 50 chickens, measuring 8ft. 4in. by 2ft. 6in., complete, with wind-proof lamp, 3 feeding troughs, and 3 drinking fountains	**5 5 0**
No. 13.—For 100 chickens, measuring 12ft. 4in. by 3ft. 7in., complete, with wind-proof lamp, 6 feeding troughs, and 6 drinking fountains ...	**7 10 0**
No. 21.—For 200 chickens, measuring 16ft. 0in. by 5ft. 0in., complete, with wind-proof lamp, 12 feeding troughs, and 12 drinking fountains	**14 0 0**

For Export Prices see page 68.

When ordering, please read Notes and Terms on page 2.

HEARSON'S COLD BROODER.



This apparatus consists of two chambers : one of these serves as a sleeping compartment, and is thickly protected from above with non-conducting material to prevent loss of heat, and the other is covered with glass to afford a little shelter when the Brooder is out of doors in inclement weather. It may be used either in an open shed or out of doors, or it may be shifted morning and night from one place to another as circumstances require.

There is no artificial heat applied to this apparatus, as it is intended for use as expained in paragraphs 175 and 176.

The loose wood floor of the sleeping compartment should be cleaned frequently, and then covered with dry earth, sand, &c., and the Brooder moved to fresh ground at least once a week.

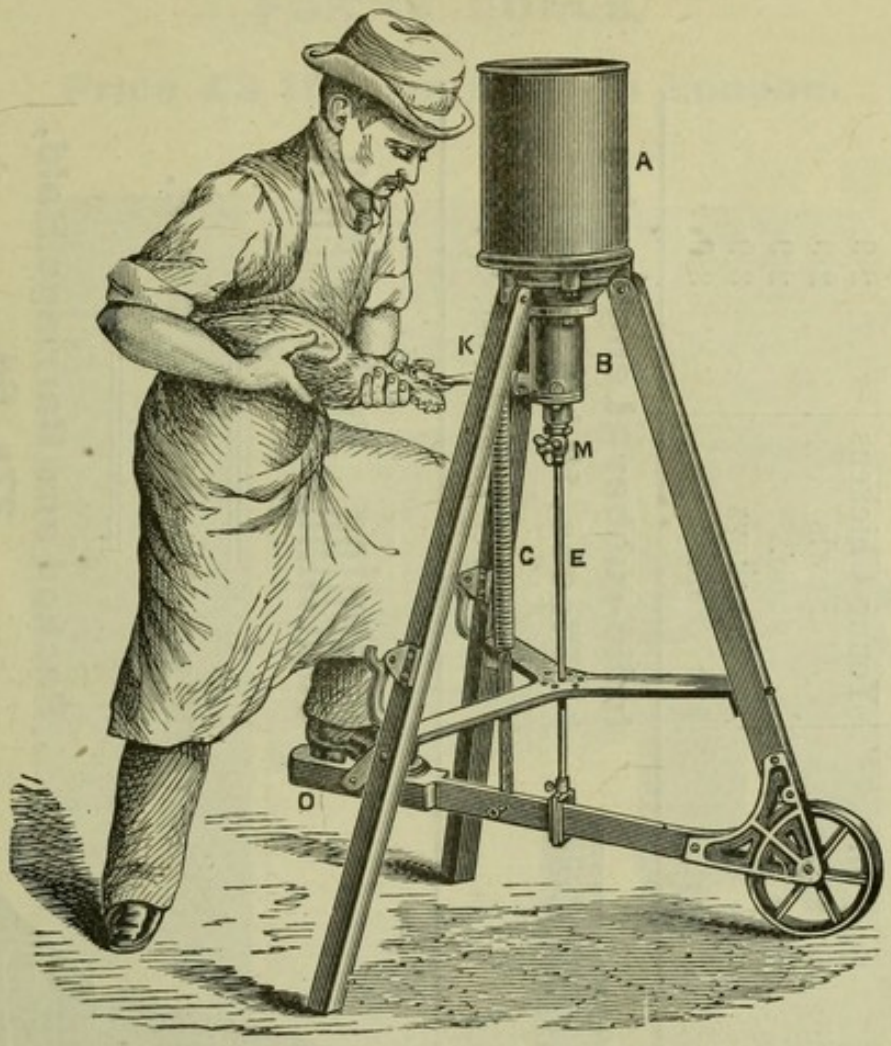
Distinctive Number.	Price.	Chicks.	Area.	Height at Eaves.	Height at Ridge.
			Ft. In. Ft. In.	In.	In.
25	30/-	25	2 3 by 2 3	10½	12
50	40/-	50	3 0 „ 3 0	10½	14
100	65/-	100	4 3 „ 4 3	10½	16
200	95/-	200	6 0 „ 6 0	10½	18

For Export Prices see page 68.

When ordering, please read Notes and Terms on page 2.

HEARSON'S PATENT CRAMMING MACHINE,

For the Forced Feeding of FOWLS, TURKEYS, &c.



It is well known to those engaged in the fattening industry that to obtain tender, fleshy poultry it is imperative to resort to artificial feeding. This can only be done by a machine of some kind, and in no other apparatus can the operation be so rapidly and effectively performed as by the Crammer shown in the illustration.

It consists of a food reservoir, to the bottom of which is attached a small force-pump actuated by a lever and treadle worked by the foot of the operator.

Communicating with the pump is a nozzle, through which the food passes to the bird.

The food reservoir can be filled, as often as is necessary, while the machine is being used. With this apparatus a practised hand will easily cram from three to four hundred birds an hour.

It is substantially built, but can be wheeled easily from one place to another.

Price, including two Nozzles of different sizes, £4 10s.

Full Particulars on Application.

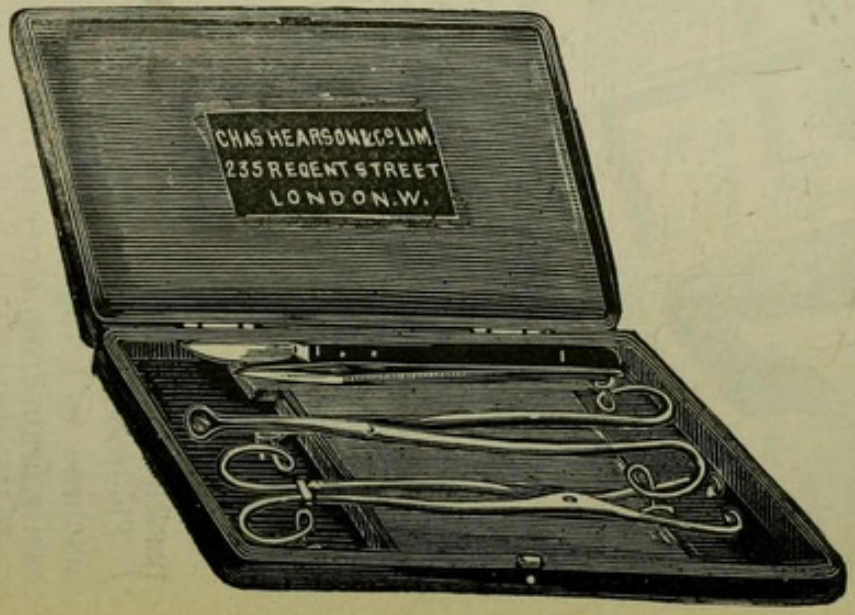
India-rubber Nozzles for Cramming Machines.

No.	Total Length.	Inside Measure.	Suitable for	Price, per Inland Post.
0	8½ ins.	¼ in.	Young Chickens	2/9
1	10 „	⅜ „	Fowls	2/9
2	11 „	7/16 „	do.	2/9
3	15 „	½ „	Turkeys	3/9
4	18 „	½ „	do.	3/9

These suit all size Nozzles.

India-rubber Lengthening Pieces, 18 ins. long.

Price, per Inland Post, 2/-.



Caponing Instruments.

BEST ENGLISH MAKE.

Packed and Carriage Paid, 27s. 6d.

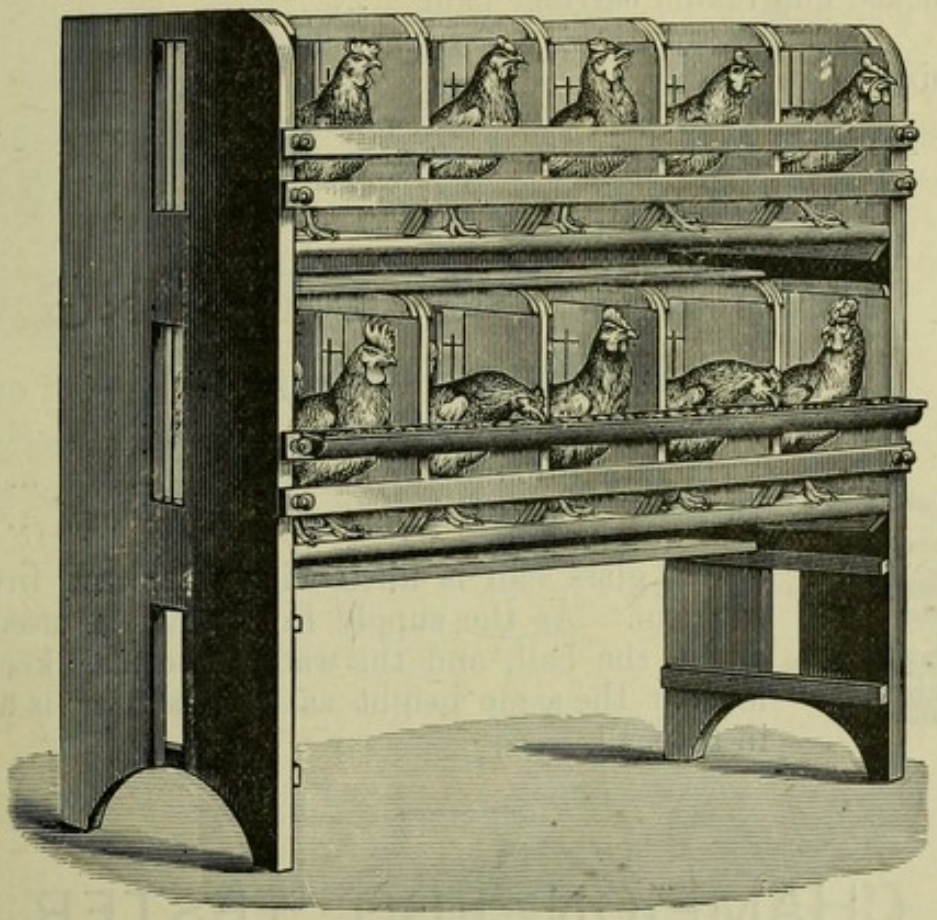
Best Quality, 31s. 6d.

Instructions with each Case.

STRAIGHT FATTENING PEN,

FOR 10 FOWLS.

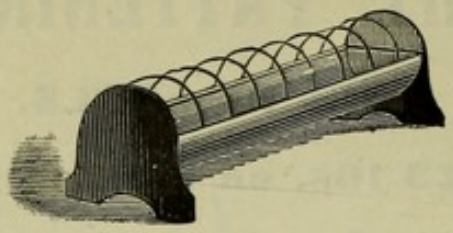
Price £3 10s. on Rails in London.



POULTRY FOOD.

	On Rails in London Bags included. per cwt.	½ cwt.
Hearson's "Eureka" Poultry Meal. The Cheapest and Best Food in the World for Chickens, Fowls, Turkeys, Geese, Ducks, &c. It consists of crushed biscuit, meat, shell, and other ingredients. Mix with hot water...	**17/-**	**9/-**
"Polysarc" (Registered), now so extensively used as a substitute for insect life, ants' eggs, and other nitrogenous food	**17/6**	**9/-**

GUARDED FEEDING TROUGH.



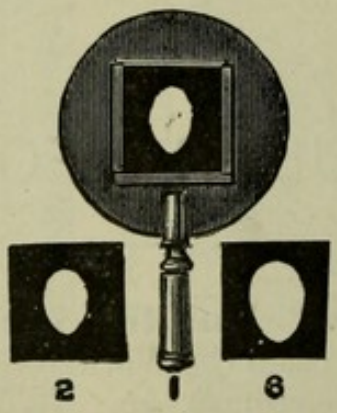
Price, packed and inland carriage paid	...	...	**2/-**
Ditto ditto per ¼-doz.	...	...	**4/9**
Larger size ditto	...	...	**3/-**
Ditto ditto per ¼-doz.	...	...	**8/-**

SELF-ACTING DRINKING FOUNTAIN.

Packed and inland carriage paid	...	**1/9**
Ditto ditto per ¼-doz.	...	**4/3**

The glass ball is filled with water and inverted in the pan. As the supply in the pan is used up, air enters the ball, and the water descends, keeping the level at the same height as long as there is any water in the ball.

CHAMPION EGG TESTER.

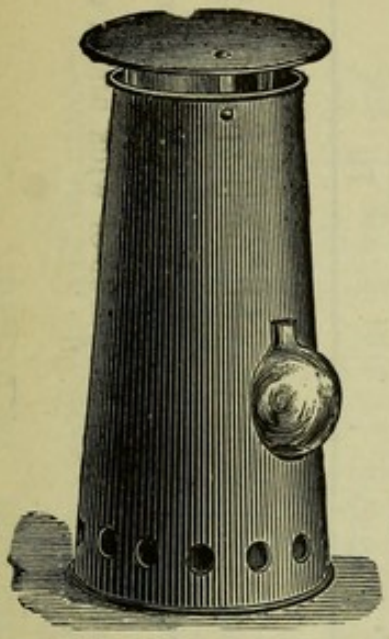


Price, packed and inland carriage paid **2/3**

Fig. 1—The Egg Tester fitted with a black diaphragm. Fig. 2 and 3—Diaphragms to suit pheasant and goose eggs.

When ordering, please read Notes and Terms on page 2.

CHAMPION TESTING LANTERN.



This Lantern is designed to meet the difficulty which operators experience in obtaining an intense beam of light without overheating the eggs. As we approach a flame the heat, as well as the light, increases inversely as the square of the distance ; consequently, if an egg be brought very near even a small flame there is a risk that it will be damaged. In the Champion Lantern a globe of water is introduced between the flame and the egg. This effects the double purpose of concentrating the light and stopping the heat-rays of low refrangibility. The result is that the contents are seen to great advantage, and can be examined leisurely.

The above Packed and inland carriage paid	... ...	**9/-**
Glass Globes for ditto	ditto	**1/-**
Chimneys for ditto	per ¼-doz.	**2/-**

EXPORT PRICES, WEIGHTS AND MEASUREMENTS.

DISTINCTIVE NUMBERS ☞	1	2	6	11	20	35	45
* **Incubators**	3 1 6	4 15 0	8 0 0	10 17 6	17 5 0	11 5 0	18 10 0
Contents in Cubic feet	$2\frac{3}{4}$	5	11	24	42	27	53
Gross weight in pounds	35	65	120	250	430	285	490
Net „ „	20	45	75	155	250	176	300

DISTINCTIVE NUMBERS ☞	0	3	7	13	21	'Champion'
* **Hydrothermic Foster Mothers**...	3 0 0	4 5 0	5 12 6	8 0 0	14 10 0	5 18 6
Contents in Cubic feet	$4\frac{3}{4}$	$7\frac{1}{2}$	$13\frac{1}{2}$	28	62	52
Gross weight in pounds	50	90	170	300	550	280
Net „ „	35	60	120	220	320	190

DISTINCTIVE NUMBERS ☞	25	50	100	200	Cramming Machine.
Cold Brooders	1 18 0	2 8 0	3 15 0	5 7 6	4 18 6
Contents in cubic feet	8	13	27	54	14
Gross weight in pounds	75	105	175	330	130
Net „ „	40	60	110	235	70

* The above Prices include delivery at the Docks in London. Special care is taken in packing for Export, and the prices named in the above list include an extra capsule and a double set of drawer thermometers, six yards of lamp wick, six lamp chimneys, a double set of canvases for each Incubator ; also three yards of wick and a crate for each Foster Mother.

PRICE LIST of SUNDRIES for Hearson's 'Champion' Incubator,

Packed and Inland Carriage Paid.

SPECIAL NOTICE.—When corresponding about Incubators, or ordering Sundries, please quote ALL the numbers on the top edge of the drawer front, whether stamped or otherwise.

If the numbers are obliterated the distinctive number of the Incubator must be given thus, 1, 2, 6, 11, &c., or, in default of this, the internal measure of the drawer in inches, or the number on the lead weight.

DISTINCTIVE NUMBERS ☞	1	2	6	11	20	35	45
Tank Thermometers	3/-	3/-	3/6	3/9	3/9	3/9	3/9
Drawer do	2/9	2/9	3/-	3/-	3/-	3/-	3/-
Lamp Complete with Burner	4/-	4/-	5/3	7/3	9/6	7/3	9/6
Burners only	2/-	2/-	2/6	4/-	5/6	4/-	5/6
Reservoirs only	2/6	2/6	3/-	3/6	4/-	3/6	4/-
Glass Chimneys, each	1/-	1/-	1/6	2/-	2/-	2/-	2/-
Do. do. per ¼-doz.	2/-	2/-	3/4	4/9	4/9	4/9	4/9
Canvas for Egg Drawer	5d.	5d.	6d.	8d.	8d.	8d.	1/1
Do. for Water Tray	8d.	8d.	10d.	1/2	1/2	1/2	1/10
Lamp Wick, per yard	4d.	4d.	5d.	8d.	7d.	8d.	7d.
Drying Box Trays...	—	—	2/-	2/6	3/6	—	—
Water Trays Complete	2/-	2/6	3/-	5/-	6/-	5/-	12/6
Perforated Tops only	1/-	1/3	1/6	2/3	2/9	2/3	5/6
Water Trays only	1/3	1/6	2/-	3/6	4/-	3/6	8/-
Dampers	6d.	6d.	9d.	9d.	9d.	9d.	9d.

Needle Rods ... all sizes ... 6d.	Globes for do. 1/-	‡Capsules for use in our Incubators only 10/2
Plug for Lamps ... „ ... 6d.	Chimneys for do. per ¼ dozen ... 1/6	Excelsior Valve 11/6
Milled-head Screws (P & H) „ ... 6d.	Gas Attachment & 4ft. Rubber Tube 5/6	Register Sheets, per dozen ... 6d.
Overflow & Emptying Caps ... 6d.	Gas Pressure Governor & 4ft Tube 10/6	Tin Funnels, each 1/-
Egg Testers 2/3		
Testing Lanterns 9/-		

‡ We allow 7/- each for returned, damaged Capsules, in exchange for new ones, if received within seven days : thus the actual cost of a new Capsule is 3/2, carriage paid.

Goods requiring Alteration or Repair, must be sent to our Works.

PRICE LIST of SUNDRIES for HEARSON'S FOSTER-MOTHERS,

Packed and Inland Carriage Paid.

SPECIAL NOTICE.—When ordering Sundries please quote the name and size of your Foster-Mother.

If you do not know the Distinctive Number of your Hydrothermic, quote the Length of the Sleeping Compartment from Door to Door.

Sundries for Hydrothermic Foster Mothers.

DISTINCTIVE NUMBERS ☞	0	3	7	13	21
Lantern, Complete	9/-	9/6	13/-	15/6	15/6
,, Only	6/-	6/6	8/6	10/-	10/-
Reservoir and Burner	4/-	4/3	5/3	6/3	6/3
Burner only	2/-	2/-	2/6	3/-	3/-
Perforated Metal Chimney	9d.	9d.	1/-	1/6	1/6
Lamp Wick, per yard	4d.	4d.	5d.	6d.	6d.

Champion Foster Mother Parts.

Lantern	3/6
Reservoir & Burner	6/3
Burners only	4/-
Lamp Wick, per yard	5d.
Ventilating Shaft	1/2
Iron Chain	6d.
Mirror & Chain	8d.
Glass Chimney	2/-
,, per ¼ dozen	4/9
12 Screw Eyes & Washers	1/4
Caps for Emptying Tubes	6d.

Sundries.

Emptying Cocks	4/-
Drinking Fountains...	1/9
,, per ¼ dozen	4/3
Glass Globes for do.	1/-
,, per ¼ dozen	2/3
Feeding Troughs	2/-
,, ...per ¼ dozen	4/9
Caponing Instruments	27/6
,, finest quality... ...	31/6
Folding Tripod Net	3/6

	1 Pint	2 Pints	4 Pints	8 Pints
Black Waterproof Enamel, Tin Bottle included	1/-	1/6	2/-	3/6

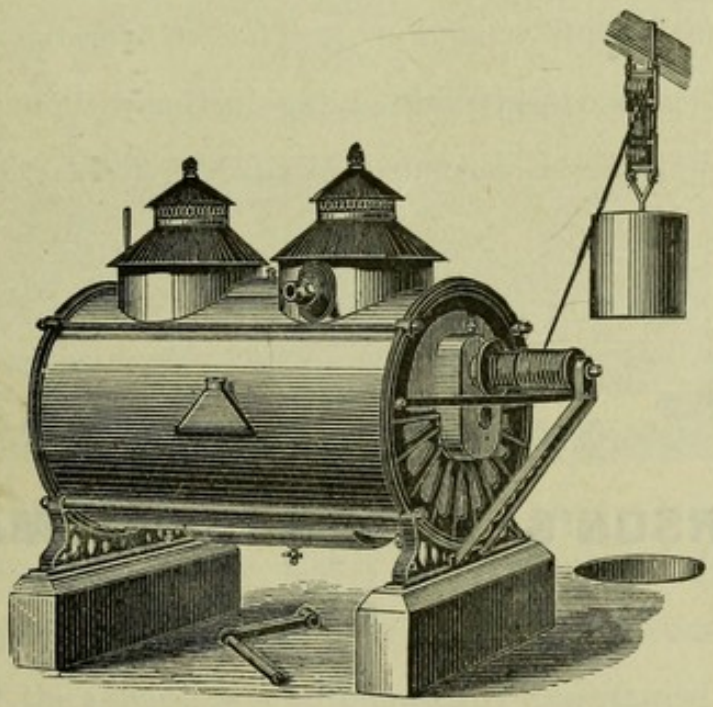
CHAS. HEARSON & CO., LIMITED,

ARE ALSO THE

Inventors and Manufacturers of the following Specialities:

THE PATENT "SUN" GAS-MAKING MACHINE.

For LIGHTING COUNTRY HOUSES, &c.

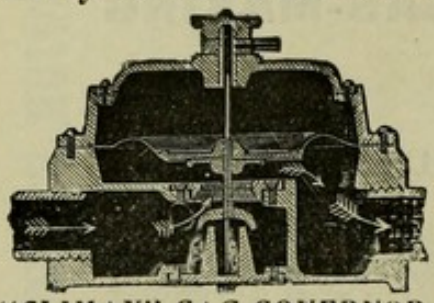


THE "SUN" GAS MACHINE.

This apparatus is a simple piece of mechanism for making Gas from Gasoline. Over one thousand of them are in use, and many of the finest country houses in Great Britain are lighted with Gas made by them. Any one who can wind a clock or turn a grindstone can take charge of a "Sun" Machine and do all that is required to be done in five minutes daily. For further particulars send for Descriptive Illustrated Pamphlet, price Sixpence.

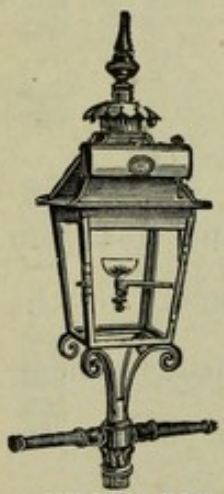
HEARSON'S PATENT "CLIMAX" COAL GAS GOVERNOR.

Every consumer of Coal Gas should use a Governor of some kind. Every scientific man or engineer who examines this Governor is struck with its simplicity and perfection, and is at once convinced that nothing better can be desired. Any gas-fitter can fix it, and will do so at same price as we supply and fix it in London. The Governor equalises the pressure and effects a considerable saving in Gas without decreasing the light. Consumers should read our Descriptive Circular, post free.



"CLIMAX" GAS GOVERNOR.

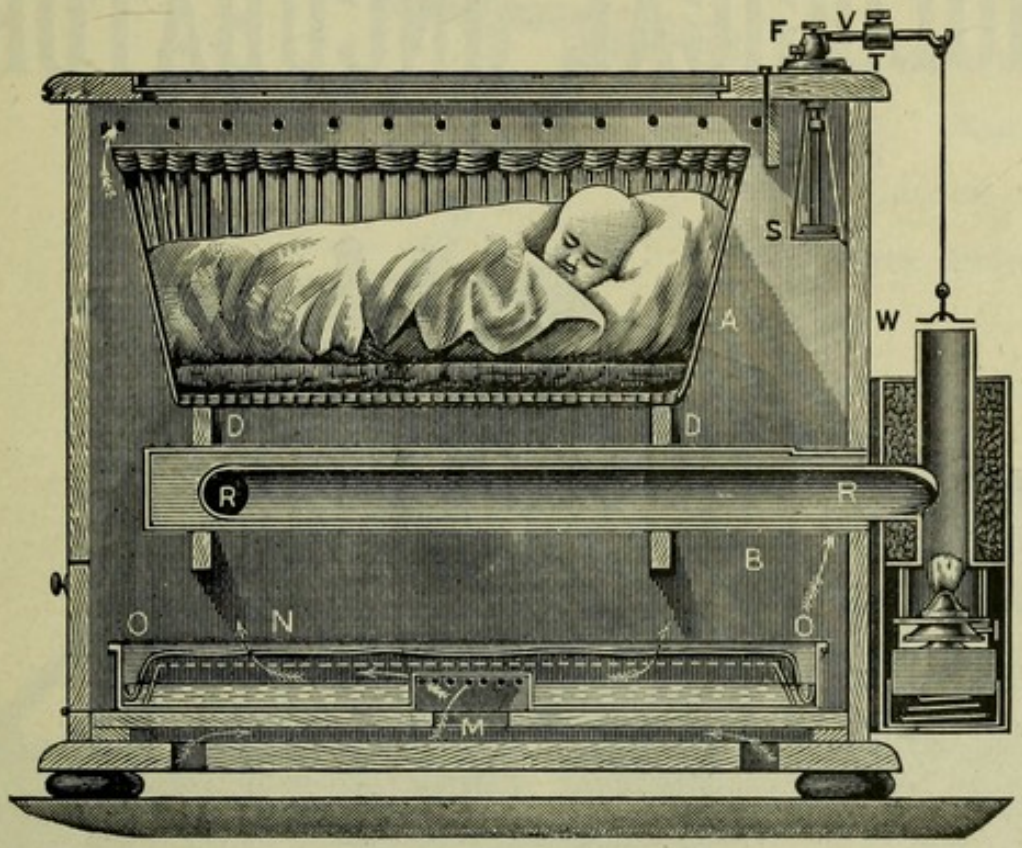
HEARSON'S PATENT AUTOMATIC GAS LAMP.



AUTOMATIC GAS LAMP.

This Lamp makes its own Gas as it burns, each Lamp being fitted with a Reservoir of Spirit, which when converted into Gas, will burn for sixteen hours without attention. In use for lighting Towns, Villages, Railway Stations, Lodge Entrances, &c. A description of this apparatus is given in the Gas Machine Pamphlet mentioned on preceding page.

HEARSON'S PATENT "THERMOSTATIC" NURSE, OR BABY INCUBATOR.



An appliance for nursing sickly or premature infants. In this apparatus every condition laid down by the faculty is completely satisfied. The interior of the apparatus is automatically maintained at a practically uniform temperature, and the damping of the air and ventilation are efficiently and continuously carried on.

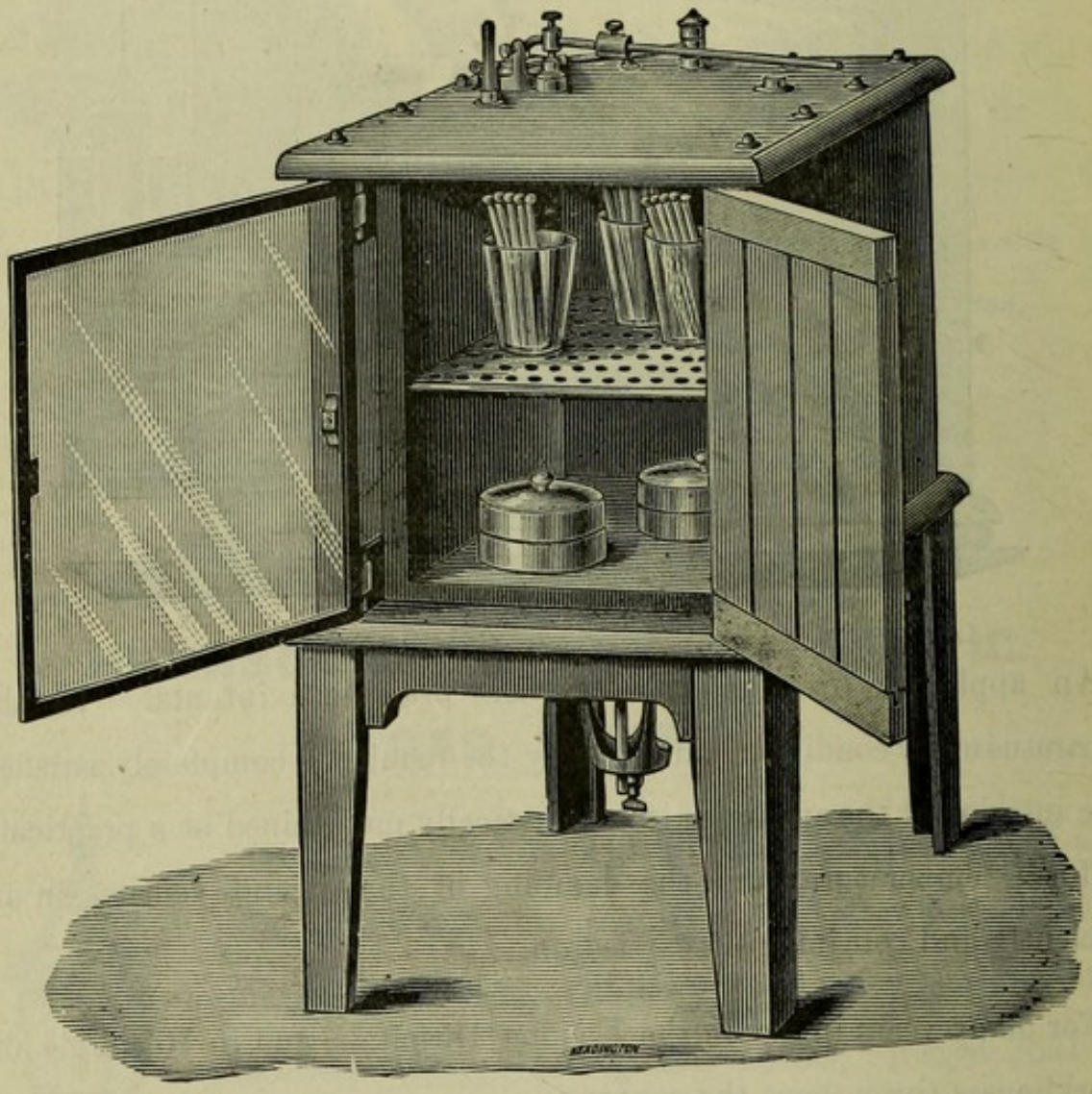
For many years in use in the London Hospitals, and in Hospitals and Workhouses throughout the country.

For further particulars send for our Descriptive Pamphlet of Thermostatic Nurses, price Threepence.

HEARSON'S PATENT

BIOLOGICAL INCUBATOR,

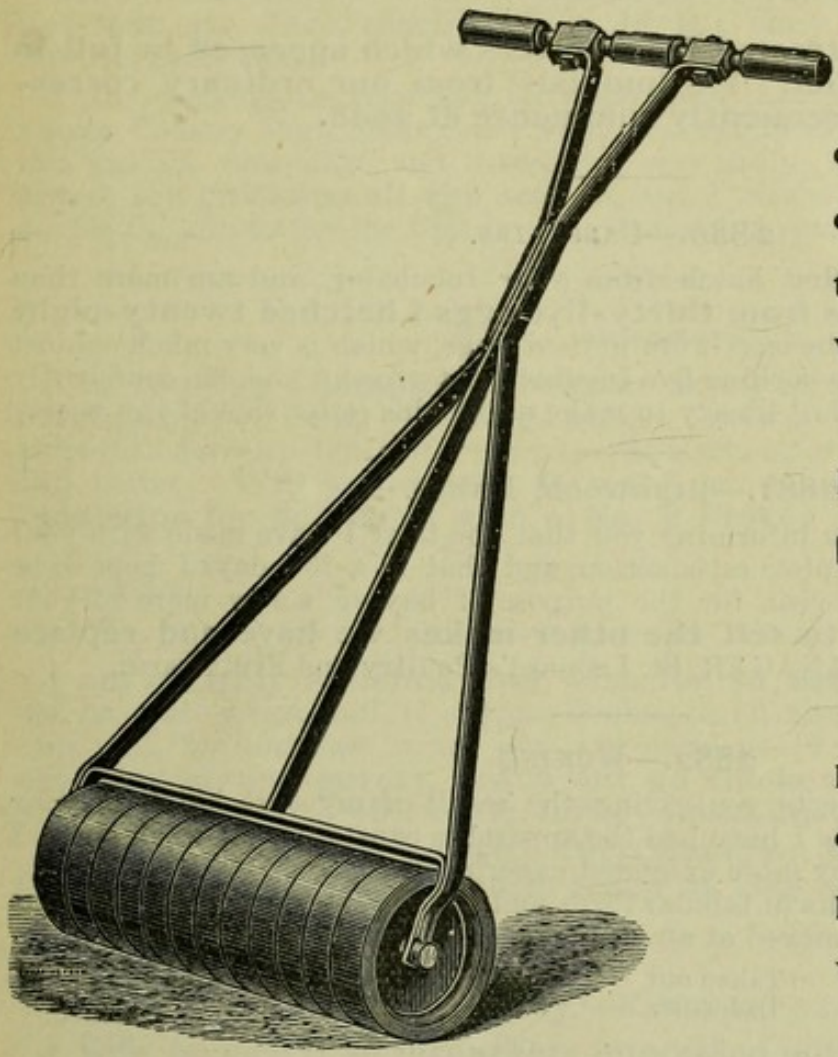
For the Cultivation of Micro-Organisms.



Suitable also for researches in Embryology and Histology, and in preparing and embedding objects for Section cutting ; also for regulating Watches, Chronometers, &c.

HEARSON'S

PATENT SOLID SECTIONAL GARDEN ROLLER



FOUR TIMES more efficient than any other Garden Roller the same Price and Weight.

Constructed of Solid Iron,

HEARSON'S GARDEN ROLLER

produces the greatest compressive effect possible from a given weight of Metal.

No.	Length.	Diameter.	Weight.	Price.
30	16 inches.	7 inches.	150 lbs.	£2 0 0
40	19½ ,,	7 ,,	185 ,,	2 8 0
50	23 ,,	7 ,,	210 ,,	2 16 0
60	26½ ,,	7 ,,	240 ,,	3 4 0
70	30 ,,	7 ,,	275 ,,	3 12 0
80	16 ,,	10 ,,	308 ,,	3 15 0
90	19½ ,,	10 ,,	382 ,,	4 5 0
100	23 ,,	10 ,,	458 ,,	4 15 0
*130	33½ ,,	10 ,,	690 ,,	6 10 0

* With Gear for Horse.

Carriage Paid to any Railway Station in England or Wales, irrespective of value.

TESTIMONIALS.

The following are extracted from letters which appeared in full in our Seventeenth Edition. Testimonials from our ordinary correspondence received subsequently commence at 2998.

2880.—Carstairs.

I have completed the first hatch from your Incubator, and am more than satisfied with the result, **as from thirty-five eggs I hatched twenty-eight strong chickens.** All the eggs were pullets' eggs, which is very much against Incubator hatching. I am working five Incubators at present, and can confidently praise yours. You are at full liberty to make use of this letter should you wish.

2881.—Ringwood, Hants.

I have much pleasure in informing you that the trial I have made with your machine has given me complete satisfaction, and that in a few days I hope to be in London, to pay you a visit for the purpose of buying a few more of your Incubators, as **I intend to sell the other makes we have and replace them by yours**—The MANAGER, St. Leonard's Poultry and Fruit Farm.

2882.—Woking.

Early in July last I wrote you giving the result of my first hatch in your Champion Incubator, and as I have had the apparatus constantly at work since, I am now able to give you my more extended experience.

I have arranged the results in tabular form, and think that beyond stating that the unfertile eggs were removed at an early stage, the table explains itself.

	Eggs put in.	Taken out Unfertile.	Fertile Eggs.	Hatched.	Percentage of Fertile Eggs Hatched.
June	117	24	93	76	81·7
July	117	25	22	64	69·5
Aug.	122	35	87	82	94·2
Sept.	110	18	92	80	87·0
Oct.	106	—	80	71	88·7

In my opinion the apparatus leaves nothing to be desired, and in view of more extensive operations in the coming season I have had the "Sun" Gas laid on against the wall of one of my out-buildings, and shall be glad if you will send me three more No. 11 Incubators, with the burners arranged for gas, also a spare burner to take the place of the paraffin lamp in the Incubator I have by me.

I may mention that I have found no difficulty in keeping the temperature within two degrees the whole time the apparatus has been in operation.

2883.—Gloucestershire.

You will be pleased to hear that the first hatch of chickens has been a success. **All the eggs which were fertile produced fine chickens,** which are looking vigorous and healthy. The greater number are now transferred to the Foster Mother.

2884.—WALLINGFORD.

The first lot of eggs I placed in were more than one-half clear ; **the remainder hatched out at the rate of 75 per cent;** the second lot of eggs turned out exactly the same, viz., 75 per cent ; and this day I have hatched out a third lot at the rate of 66 per cent. I have hatched out a few chickens, two or three at a time, between these three lots, **all hatched out strong and well.**

The chickens are now in the Foster Mother I purchased of you, and **I have not lost one since placing them in it; they look well, and grow wonderfully fast.**

I was working an Incubator all last season that I purchased at the Crystal Palace Poultry Show (1881), and which was exhibited there, but am sorry to say this was not your make, and turned out very badly, for **I only hatched out about ten chickens all the season,** and I was working it in a room nearly double the size to the one that I am now working your "Champion" in.

2885.—ROTHERFIELD.

The 100-egg Champion Incubator acted as you said it would, and hatched 75 per cent. of strong chicks. Most of the eggs had been laid for more than a week before being placed in the machine, or perhaps it would have done still better. **Will you please forward as soon as possible a No. 20 Incubator for 200 eggs, also a No. 8 Foster Mother.**

2886.—CRAWLEY DOWN.

I am entirely satisfied and wish for no better machine. I should not be at all disinclined, if any one doubts its efficiency, to stake a considerable sum that, barring east winds and any accidents, **I will, from 100 fertile eggs and strong germs, hatch out 90 chickens, or even more. This applies equally to chickens, turkeys and ducks.**

My hens, as compared with the Champion Incubators, are simply useless, taking them on an average at this season.

2887.—FAREHAM.

I was, however, so favourably impressed with the ease with which your Lamp Incubator could be worked that I at once parted with the Hydro Incubator.

On the 7th of January this year I started your Incubator with 92 of my own eggs, principally Bramah Houdans. Of these 82 proved fertile and 68 were hatched, leaving six dead in shell and eight addled.

I consider this very good, as it amounted to 83 per cent. of fertile eggs; and besides this, every one of the chicks was fit, after 12 hours, to be put into the Mother, **a result I have never attained before,** as I have invariably had some with crooked toes, or deformed legs, or some other defect.

2888.—STOCKTON-ON-TEES.

I have now been working the Incubator since the beginning of December, and have not seen the drawer temperature below 103° or above 105°. Altogether I have been very pleased with both Incubator and Foster Mother, and feel certain they are far ahead of any others in the market, and are very easily managed, and **really give one all the pleasure they could expect without any trouble.**

2889.—SHIPTON-UNDER-WYCHWOOD.

I have worked your Champion Incubator for 100 eggs **with the greatest satisfaction.** The temperature in the drawer has scarcely varied from 103° which I think is the best. My last hatches have been **eight out of eight eggs, thirteen out of fifteen, and twenty-four out of twenty-five.**

P.S.—Your readers may care to know that on two or three occasions I have broken an egg in the air-bubble when I have been doubtful whether the chick has been alive. Finding the chick moving, I have fastened a piece of postage-stamp over the hole, and the chicks have hatched out in due course.

2890.—LEEK.

I have found no trouble in managing the Incubator. **The heat in the egg drawer never varied a degree all the time.** I have never tried any other Incubator, but have seen them at work, and from what others have told me, **I think yours is the best and easiest managed. I find your Foster Mother to answer admirably.**

2891.—CATERHAM.

In November last we purchased one of your No. 11 Incubators, and we have much pleasure in informing you that we are thoroughly satisfied with it. We placed it in the hands of a person quite inexperienced in the working of Incubators, and he has, after carefully perusing the instructions, succeeded in keeping the temperature of the egg drawer at a minimum of 102° to a maximum of 106° between the 12th November and the 4th January, **after which date no record has been kept, as the machine worked so successfully.**

These are practically the only two things to attend to properly to ensure success. **the working of the Incubator being so simple that any child capable of reading the instructions could easily manage it.** We never lose an opportunity of recommending your Incubator, **believing it to be the best and most simple ever invented.**

2892.—MORTON.

In reply to your circular, I am only an amateur, and the Incubator I bought of you was the first I had ever seen.

I have not found pullets' eggs to hatch well, but **hen eggs have hatched beyond my expectations, viz., about 75 per cent.,** excluding, of course, the bright ones.

2893.—ROMSEY.

I shall have another batch out next week, but in the meantime Incubator works admirably. **After much experience with C—y's and a French one also, I think yours is beyond improvement. I got seventeen ducks from seventeen eggs the other day—100 per cent.—and about 60 per cent. early chickens,** which are always more liable to die in their shells than late ones.

2894.—FARNHAM.

We have hatched off forty-one chicks from sixty-seven eggs. The temperature of the drawer kept very uniformly at or near 104°.

2895.—WINCHFIELD.

It may interest your readers to knew that the drawer of my Incubator was left out one night at 7-30, and was not put in again until 4 a.m.—eight hours! but nevertheless, **twenty-one hens and seven duck eggs hatched out of**

thirty-seven hen's and eight duck's. One egg was cracked after a week's incubation, and a piece of soap plaster put over the crack; the chicken is out and alive.

2896.—PULBOROUGH.

I really only meant to have one Foster Mother, but as I am having two No. 11 Incubators, I might as well have two Foster Mothers. I shall most likely require some more Incubators later. **Your Incubators work very well, keeping excellent regularity, C——ts's do pretty well, but nothing like yours.**

2897.—RUGBY.

Lady ———, in answer to Mr. Hearson's letter, begs to inform him that **she found no difficulty in hatching a late setting of eggs last year** (in one of his Champion Incubators), that the heat of the drawer was very easy to manage, and the result was that **out of twenty-four eggs she got nineteen chickens.** The amount of oil the lamp burnt was small. Lady ——— and a young maid looked after the Incubator entirely, and they followed the instructions in Mr. Hearson's book.

2898.—TAMISE.

Baron Lunden is very much satisfied with the Incubator you sent him, and he tells me **it beats all the others into fits. Out of thirty-six eggs he has hatched twenty-six. Please to send him a No. 11 and a No. 20 Incubator at once.**

2899.—FARNHAM.

I have never hatched less than thirty-five chickens from fifty eggs. **My highest hatch this season was forty-five out of fifty.**

2900.—BAGSHOT.

I should have written earlier to let you know how I got on with the Incubator I bought of you last November, but as I was only able to get shop eggs for a long time, I did not think that the result, which was naturally poor, a fair one.

Since I have used none but the eggs from my own fowls, I have had the very best of luck.

I consider your machine quite perfect, and better than a hen, strange as it may sound to assert such a thing.

There is no breaking of eggs nor trampling on chickens; moreover, the chicks hatch stronger as a rule and far more regularly, nearly all thirty-six hours before the expiration of the usual twenty-one days, which I believe to be owing to the more uniform heat of the Incubator.

It has never varied more than one degree with me.

2901.—NEWENT.

You will be pleased to hear that after filling your Incubator drawer a few weeks ago with Leghorns', Dorkings', Rouen ducks', Chinese geese eggs, &c., **130 have been hatched.** The chicks are progressing remarkably well, being strong, active, and healthy.

2902.—PEPWORTH.

I have now hatched two lots of chickens from your Incubator. **In one case I hatched rather over 78 per cent., and in the other exactly 80 per cent. of the fertile eggs.**

The temperature in the egg drawer is surprisingly uniform. It has not varied more than two degrees.

2903.—CHUMBA, *viâ* DALHOUSIE, INDIA.

I send you the result of 21 days' working of your Champion Incubator; **you will see from the register how wonderfully even the temperature has kept.** The machine gives the minimum of trouble; **the damping arrangement is perfect.** The Incubator stands on a table in my study, and is no inconvenience. **I only wish I had a 100-egg one, so as to be able to hatch out faster.** The Foster Mother is very simple, and answers its purpose excellently.

COPY OF REGISTER.

Date.	Temperature of			No. of Eggs put in.	Number & Description of Eggs put in.			Hatched.	REMARKS.
	Water.	Drawer.	Room.		Unfertile.	Addled.	Dead in Shell.		
March	Deg.	Deg.	Deg.						
15 E.	130	104	66	53					
16 M.	128	104	62						
,, E.	124	104	66	8					
17 M.	125	104	64						
,, E.	129	104	66						
18 M.	124	104	65						
,, E.	124	104	66						
19 M.	123½	104	66						
,, E.	124	104½	66		2*				
20 M.	123	104	64	10					
,, E.	123	104½	66	—	7*				
21 M.	123	104	62	—					
,, E.	123	104½	68	—	6*	—	—	—	Cloudy weather and rain
22 M.	123	104	66	7					
,, E.	123	104	66	—	—	2	—	—	Heavy thunderstorm in the night.
23 M.	123	104½	66						
,, E.	122½	104	66						
24 M.	123	104½	65						
,, E.	123	104½	66						
25 M.	123	104½	66						
,, E.	121	104½	69		3*				
26 M.	121½	104	66						
,, E.	124½	104	70	—	—	—	—	—	Lead ball pushed back 1in. to decrease heat.
27 M.	120½	103½	66						
,, E.	121	104	66	—	—	—	—	—	Rain and cold wind.
28 M.	120½	104	66	—	—	4	—	—	Lead ball pushed back 1in.; clear hot day.
,, E.	118	104	68						
29 M.	118	103½	66						
,, E.	116	103¾	70						
30 M.	116½	103¾	67						
,, E.	114	104	71	—	—	4			
31 M.	115	104	69	—	—	—	—	—	Earthquake for 1½ minutes at 7.15 a.m.
,, E.	113½	104¼	72						
April									
1 M.	114	104½	70						
,, E.	115	104	68						
2 M.	115	104½	68	11	—	—	—	—	Thunder and heavy rain, much cooler outside.
,, E.	116	104	67						
3 M.	115	104	68				7		
,, E.	115	104	70	—	—	—	—	—	Seven shells chipped.
4 M.	114	103½	69	—	—	—	—	8†	
,, E.	117	103¼	66	—	—	—	—	10†	
5 M.	124	104	60	—	—	—	—	11†	
				89	18	10	7	29	

* These were eaten, and, therefore, not wasted. † All fine, strong, healthy chicks.

Hatching still proceeding, but send this to catch the mail. The Incubator was worked at an elevation of 3300 feet above the sea-level, with a capsule marked for 3170—99°, which answered admirably.

2904.—SHANKLIN.

I am glad to tell you the machine acts perfectly now. I did not quite understand it when I wrote, and had not enough heat. **I certainly find it much less trouble than C——'s pattern, or rather O——n's, which I am using at the same time as yours, and four or five of yours can be worked in the same time.**

2905.—UPPER RICHMOND ROAD.

I have been away for a week and left the Incubator in charge of my maid. **I think you will be pleased to hear that it never varied one degree. I have worked C——'s and V———'s, but I find yours the least trouble.**

2906.—BURGESS HILL.

I am pleased to say the Incubator has on every occasion I have used it hatched out every possible egg.

2907.—ERIDGE, SUSSEX.

Mrs.———is very much pleased with the Incubator;-it works perfectly.

2908.—ICKENHAM.

I have much pleasure in testifying to the efficiency of your Incubator.

I am working a 200-egg machine, and **have never seen it vary more than two degrees from the time I first had it fairly started,** about two-and-a-half months ago.

Suffice to say that, without a hen on the premises, I have a finer lot of chickens than any one near here, and **every one who has seen them pronounce them much finer than any they have ever seen.**

I have hatched at the same time fowl, duck, geese, pheasant, and thrush eggs

I find it no trouble whatever, and **any one can be left in charge,** without the owner being at all anxious.

I would never risk valuable chicks with a hen after using your Foster Mother. I consider it far better than any hen, and I am positive the chickens grow and fledge far quicker under it.

2909.—CO. WICKLOW.

Mrs.——— begs to inform Mr. Hearson that the Champion Incubator has given the greatest satisfaction.

She has been most fortunate with turkey eggs this year, the temperature of the drawer being kept at 106° or 107°.

[ED.—This temperature can only be tolerated when the weather is cold; in hotter weather, a lower temperature in the egg drawer is desirable.]

2910.—HAVERFORD WEST.

The average result of my hatches up to May 22nd had been about 75 per cent. from eggs taken indiscriminately from the poultry yard, with no other precaution than that they were not more than six days old.

Yesterday the Incubator hatched four healthy turkey chicks from four eggs, and twelve ducklings from twelve eggs, equivalent to cent. per cent.

I have hatched 54 ducklings and 33 chickens. The mortality to date is two chickens and four ducks: the latter are from Pekin and Aylesbury strains.

2911.—WESTAL, CHELTENHAM.

* Mrs. M. A. Wilson thinks it is due to Mr. Hearson that she should testify to the excellent results obtained with his Incubator. **She has hatched in one drawer the eggs of geese, ducks, and hens; also Guinea fowl and golden pheasants, and the percentage obtained has been highly satisfactory.**

* This Lady is the authoress of the A B C Poultry Book.

2912.—TEDDINGTON, S.W.

Both Incubators that I purchased of you **have given entire satisfaction,** for I have hatched out a great number of chickens : also ducks and geese.

2913.—MIDHURST.

Lady ——— takes this opportunity of giving her testimony to the perfect working of Mr. Hearson's Incubator. It is managed with the smallest amount of trouble, and **the regularity of the temperature is astonishing.** She has had one in use for a twelve-month, and has hatched chickens and ducks. **She considers that these thrive almost better in the Foster Mother than under a hen.**

2914.—GANAREN.

I am in receipt of your circular of the 22nd, and **confidently support what has been said in favour of your Incubator.** Amongst my experiences of it the following may be interesting : Thirteen goose eggs were brought me, the owner having found the goose dead on the nest. She had been sitting a **fortnight,** and the eggs were **quite cold,** and with your Incubator (100-eggs one) **hatched out eight goslings as fine as any one could wish for.**

2915.—BUNTINGFORD.

In use this season your two Incubators **have given the utmost satisfaction. They have hatched brood after brood of fowls, ducks, and turkeys all equally well. But with the turkeys my success has been extraordinary; hardly an egg has failed to produce a healthy chick.** Last season I hatched with great success partridges and pheasants. **A village girl looks after the Incubators; but they work so uniformly well, and keep up such a regular heat, that there is really nothing for the girl to do but fill the lamps and trim the wicks,** which is done morning and evening.

I have worked Incubators now for three years, but I have never met with complete success until I purchased yours about six weeks ago. Out of 22 fertile eggs I hatched 20 chicks; the other two died in shell. The Rearer works very well, and all the 20 chickens are alive and healthy. They are now nearly three weeks old.

2917.—SEVENOAKS.

Major——— has much pleasure in informing Messrs. Chas. Hearson & Co., that the Incubator they supplied him with **has given entire satisfaction.**

2918.—SUTTON COLDFIELD.

I had a very good hatch out of my Incubator on Monday—37 out of 44. All the chickens are quite strong and healthy.

2919.—SOUTHGATE.

You will be pleased to hear that last week I had a very successful hatching of ducks, over 94 per cent., all strong and healthy. I was very doubtful about them, for somehow they were so long in getting out.

Some of them commenced billing on Tuesday, and were not free of the shell until Thursday morning. The eggs were stale, varying from a fortnight to a month old.

2920.—LEEDS.

Your Incubator has been most successful with me, no trouble to keep in order, and **I am hatching fully 90 per cent. of eggs put in.** If your customers will use only eggs that are **quite fresh,** and put them in the same day or the next day they are laid, **nearly every fertile egg will hatch out strong on the 20th day.**

2921.—COVENTRY.

Our client has expressed his great satisfaction with your Incubator and Foster Mother. **He thinks them as nearly perfection as any artificial means can be.**

2922.—WEST COWES.

In reply to your query, I have worked your Incubator with uniform success hatching fowl, duck, and pheasant eggs.

I hatched in one case 95 per cent. of the fertile eggs.

2923.—BALA.

I have during the last two years hatched out perhaps 12,000 or more pheasants in your Incubators, besides wild ducks, chickens, and galena.

I only use them for finishing the hatching in the case of pheasants. Hens are used up to the time the eggs begin to chip. Wild ducks I have set and brought up with no hen whatever, but pheasants need a natural mother. I consider your Incubators most useful.

2924.—HEPTONSTALL.

The No. 11 Incubator we purchased from you in February last **is giving extreme satisfaction.** We have had three hatches of **hen eggs, averaging on the whole 95 per cent. of the fertile eggs. This exceeds our anticipations, and is far ahead in results obtained by sitting hens.**

I may just say the Incubator has been in charge of a lady who has been staying with us, and who has had no experience in the working of, or even seen one before.

We have had great pleasure in showing and explaining the results obtained to our numerous friends, and we shall lose no opportunity of recommending your Champion Incubator.

2925.—LEEDS.

I have been going to write for some time, but have been making experiments on my own account. **There is now passing my window a regiment of the finest ducklings I have ever seen at eight weeks old, hatched in your Incubator.** They are just returning from the fields, where they have been hunting for slugs, &c., and now, at five o'clock, like the labourers who have also been toiling all day, they march home in companies. I have them at all ages, from eight weeks old to those newly hatched. In about a week or ten days, the young ones have to take their chance with the rest. We feed them at 6 a.m. They then go off to the fields to earn their living, sometimes half a mile away, and

we see no more of them until 5 p.m., when they come home for supper. They are then shut up in the yard for the night. But I am not replying to your note respecting the Incubator. **The fact is I have little to say; it is simply perfection.** We trim the lamps three times weekly, and turn the eggs twice daily, and when that is said it leaves me little to say. **We have not had occasion to alter or adjust anything all the season; indeed there is nothing to get out of order, it is so simple in construction.** All that the Incubator wants is starting according to the instructions you give, and **then letting alone.** If your Incubator will hatch chickens with the same ease and certainty it will ducks, you have solved the problem of egg and fowl importation, for **only place one of these in every farmyard in the United Kingdom, and instead of being importers, we should quickly become exporters** of eggs and fowls to a large extent, and thus would be saved to the country some millions yearly, and the farmers would pocket what now goes to foreigners.

2926.—Rugby.

It will no doubt be gratifying to you to know that on May 15th I **put 50 eggs into the Incubator I had from you, and they have all, with one exception** (which was a non-fertile egg), **come out within the last three days, so that really your incubator beats nature into fits.** The chicks are all strong and healthy. I have put 50 eggs more into **the Incubator, which has not varied one degree** (except of course when the drawer was removed), since I started it on May 15th.

2927.—Helmshore.

It gives me great pleasure to reply to your circular which I received this morning, by giving the particulars of the eggs hatched in the No. 6 Incubator purchased from you in March.

Date.	No. of Eggs put in.	Unfertile taken out.	Addled.	Dead in Shell.	Hatched.	Distance Eggs had travelled.
						Miles
March 17	22	10	3	—	9	—
„ 22	13	5	—	2	6	200
April 14	40	13	3	1	23	200
„ 25	15	1	1	2	11	4
May 5	*46	7	4	7	28	4
	136	36	11	12	77	

* Some of these Eggs were a month old when put in.

There are no deformities. I think the number of chicks hatched has been **very good,** being 77 chickens out of 100 fertile eggs.

2928.—Ponders End.

In reply to your circular, our opinion is that the rules laid down in the present pamphlet are quite sufficient for the successful working of your Incubator. We should like to suggest that you impress most emphatically upon your readers the importance of keeping the Incubator in a cool, damp place, for if coddled up in an unused room, very few chickens are the result, instead of 80 or 90 per cent. **Ours has worked capitally, hatching 80 per cent. We hope next year to do better.** Wishing you success.

[ED.—Houses are not generally chosen because they are cold and damp, therefore I am afraid that the conditions imposed are hardly such as can be found in every house. Those who have such a room will perhaps be glad to find that a good use for it now presents itself. We certainly do not object to the Incubator being put in such a place, provided there be also plenty of air; but as we have experienced equally good results in dry rooms, we are inclined to think that some other explanation is required.]

2929.—HECKMONDWIKE.

You have certainly solved the problem of artificial incubation. The Incubator I bought of you served me well last season, as well as this, with very little trouble and good results.

2930.—HAWICK, N.B.

I cannot fancy anything more perfect than the Incubator supplied by Chas. Hearson & Co.

2931.—WHITTLESFORD.

I have much pleasure in testifying to the superior claim of your Champion Incubator. I have only had mine two months. My first experience—20 chicks out of 27 eggs, and 19 ducks out of 24. At the same time I set three hens on 33 duck eggs; result, **six ducks,** proving that the eggs were fertile, but spoiled by the hens.

On the second trial of six pheasant eggs, I hatched one; the rest being first eggs, were not fertile. Of six Guinea chicks two hatched, rest not fertile; of six fancy chicks five hatched, and 23 ducks out of 31 eggs. All the above are doing well, and all came out two days before time.

I have managed the Incubator entirely myself, following implicitly your instructions.

P.S.—A duck just come off who has been sitting on 20 eggs—not **one** duckling—all spoiled, although from the same layers as I put in the Incubator.

2932.—WINGHAM.

I have had 78 ducks and turkeys out of 92 eggs; temperature 107°.

[ED.—The blood-heat of the feathered tribe is 107°, so that a higher temperature than this should never be allowed to continue for any length of time.]

2933.—STONE, NEAR GREENHITHE, KENT.

Respecting the 50-egg Champion Incubator I bought of you, I feel it my duty to inform you that it has far exceeded my expectations, and that I consider it perfect.

I must congratulate you on your inventions.

2934.—NATAL.

I am glad to say that I have been very successful for the first time of working especially as the eggs could not be guaranteed fertile. However, 80 per cent were hatched.

2935.—AUCKLAND, NEW ZEALAND.

The 100-egg Incubator we bought of you in London has given every satisfaction. The result of our first trial of it was 83 hatched, seven unfertile, 10 dead or addled. The chickens are three weeks old and doing well.

2936.—BRACKNELL.

I consider the Incubator you sent me quite surpasses any I have worked before in the saving of trouble and time. I shall thoroughly recommend it to all my friends.

2937.—STIRLING.

There has been a good hatch here—21 birds out of 23 eggs.

2938.—GOREY.

I have thoroughly tried your Incubators, and find them to be the very best yet manufactured.

I have tried several French Incubators, C——'s, &c.

2939.—LAMBOURNE.

I would not be without one of your Incubators and Foster Mothers now for anything. I have 60 fowls, all Incubator hatched, and have had a splendid supply of eggs the whole winter, when all my neighbours had none with as many hens. I never set a hen now, and the chickens in the Foster Mother grow and fledge twice as fast as with a hen; one advantage (besides the uniform warmth) is that the chickens get every bit of food given them, instead of its being gobbled up by an old hen (ravenous after three weeks' sitting). My youngest chickens, hatched December, are quite half-grown in spite of the bad weather, it having been so cold until to-day that they have scarcely been outside the Foster Mother.

I never find that I lose one from any disease or leg weakness after they are hatched. The only attention they require is for the first four or five days, as they do not at first seem to understand running under the mother again when they come out for food.

At first I always keep the Foster Mother on the lawn, where I hear if a chick is chirping, and run out at once and put it under.

[ED.—The neglect of this is probably the reason why occasional failures arise in rearing.]

2940.—KILMACOW.

I have much pleasure in reporting to you the perfect success which we have had with the No. 6 Incubator on its first trial.

I put into the drawer 55 eggs on the 19th of December. **Of these only 30 proved to be fertile at the seventh day;** the 25 unfertile ones I removed, and replaced them with fresh eggs, taking care to place a strip of folded paper (an inch wide) between them and the warm eggs. I had no difficulty at all in maintaining an equable temperature of about 104° all through—it varied a degree more or less occasionally; but my experience is that your patent thermostatic capsule does its work perfectly, and acts in a most satisfactory manner. With very little care it is possible to keep the drawer heat at any degree you decide upon for three weeks or longer. I trimmed and filled the lamp, and turned the eggs, every morning and evening. This only occupied a few minutes, and really gave very little trouble to do.

Well, on the 8th of January the eggs began to chip, and **on the 9th I had 28 fine, healthy, strong chicks hatched out—one egg was addled, and one chick was dead in the shell.** I dried them in the drying box, and then put them into the Foster Mother, which I have screwed together under a shed, **and they are doing splendidly,** and feeding well.

Now I think this a good result. You would have been amused had you seen the astonishment of my domestics, when they were brought into the room, and saw the chicks coming out of the egg drawer. They had no idea that such a process was going on, and they could hardly "believe their very eyes," as they expressed it.

2941.—CRANLEIGH.

I have great pleasure in bearing testimony to the value of your Incubator. I put in 50 eggs, two of which I took out on the eighth day, as they were clear. From the remaining 48 I got out 41 chickens. The trouble in your apparatus is reduced to a minimum. I ought to add that, by an oversight, the water-tray was allowed to get dry during the hatching.

I had one of C——'s Incubators going at the same time as yours, but my success with that was not very great.

2942.—IVER HEATH.

I send you herewith an accurate statement of my hatching account with one of your 100-egg Incubators for the month of **January,** by which you will observe that I have hatched 65 chickens from 82 fertile eggs—a truly good result, I think. Out of the 65 chicks hatched I have 62 alive and doing well. My man works the Incubator, and tells me that it has acted most regularly.

2943—SPANISH TOWN, JAMAICA.

In November last, I purchased one of your No. 20 Incubators, which I am pleased to say has given me entire satisfaction.

I shall be obliged by your forwarding me, by first R.M. Steamer from Southampton, a No. 11 Incubator complete. I also require one of your Testing Lanterns, for all of which please find cheque enclosed on London Joint-Stock Bank.

2944.—LIMERICK.

You will be pleased to hear that the first hatch of chickens in the No 1 Incubator I bought from you last October has been a success. All the fertile eggs produced fine chickens, which are now being reared by a hen who was hatching at the same time, but only brought out **one** chicken. Your Incubator brought out out of ten eggs, or 70 per cent.

2945.—MIRFIELD.

Out of 47 eggs, my Incubator hatched off yesterday 42 chickens.

2946.—DORCHESTER.

I put in 60 hen eggs, and have had forty hatched out all right ; the remainder of the eggs, with the exception of three, were unfertile. This, I think, is a good result. I am now filling it with pheasant eggs.

2947.—BENTHAM.

I am glad to inform you that your Incubator has hatched out very well indeed being the first time used. I got 20 chickens out of 25 eggs. There were two dead in shell ; the others were clear eggs. It has done much better than I expected.

2948.—KNUTSFORD.

You may, perhaps, be interested to know what success I have had so far with the small Incnbator you sent me, for amongst your records there are few equal to mine. I send the register of my first lot, 25 eggs put in, four unfertile, 21 chickens strong and doing well. I then put in 11 hen eggs and 11 duck eggs ; one hen egg proved unfertile, the 10 hatched, and are thriving, now a week old nearly , the duck eggs have not yet hatched. Thus I have hatched each time every possible egg.

I did not put any into the drawer until I well understood the working of the thing, and I tried, with what success you see, to keep the temperature at 102°.

[ED.—The register shows an average of 102° for the whole twenty-one days; the variations were insignificant. The room varied from 48° to 57*]

2949.—Gt. Bitchingham.

I am very much pleased with your Incubator. It is most easily worked, and any novice may use it from your printed instructions. From 13 Andilusian eggs, which had travelled by rail nearly 200 miles, I hatched out 13 fine, healthy chicks and 22 turkeys out of 28 eggs, three of which were unfertile and three addled. I was not quite so successful with ducks, but do not complain, as the eggs were not so good and fresh as they ought to have been. 88 eggs put in, 24 of which were unfertile, 12 addled, 24 dead in shell, which I attribute to working the Incubator at too great a heat (108°, room 55°). I think you will find 102° plenty high enough for hatching ducks successfully in any temperature over 50° as since I have kept the drawer heat at about 103° (for chickens), I have only had two dead in shell out of over 80 eggs put in Incubator. 103° is the extreme heat I think ought to be kept whenever the room temperature is 60° or over, to ensure successful hatching and keep all chicks alive.

2950.—Sevenoaks.

Having purchased one of your 100-egg Incubators early in this year, I send now the results I have experienced from the same. Having put eggs into it at such irregular times it seems to me to make the results all the more extraordinary. This result. of a fraction over 91 per cent. of fertile eggs, has been effected, I consider, solely by the excellence of your machine ; only ordinary care in the tu ning of the eggs and cleaning of the water tray, according to the **plain directions** having been taken. For the last two months I have given up the practice of registering the temperature of tank and egg drawer, as that of the last is practically invariable, standing at about 102°.

2951.—Port Talbot.

The Incubator has done very well, hatching about 80 per cent. of hen and duck eggs.

2952.—Thornhill.

Mrs. ——— is pleased to report that 55 eggs were hatched out of 60 put into the Incubator last month.

2953.—Dolgelly, N.W.

I have much pleasure in sending my register for this season. You will see that I have succeeded **better even than last year,** when I hatched 73 per cent. I may also mention that all are living and doing well.

Abstract of Register.

Total set	72
Deduct unfertile	16
Possible eggs	56
Hatched	53
Dead in shell	3

Percentage hatched, over 94 per cent.

2954.—York.

I have very great pleasure in testifying to the good qualities of your Champion Incubator, and think that if farmers only knew how easily they are managed there would be a great many more used. I would not be without one for a great deal now. I have hatched every fertile egg several times. I would not advise anybody to start with a small machine, as they will be sure to want a large one by the end of the first season.

2955.—HAWICK, N.B.

Since starting your Incubator I have been killing off all my sitting breeds and going in for non-sitters.

2956.—ST. IVES, HUNTINGDONSHIRE.

I write to say that in the last two sittings I hatched at the rate of 85 per cent. in one case, and 87½ per cent. in the other, in your Champion Incubator. The chickens do very well afterwards. I was quite a novice at the work, never having seen one before or reared any chickens.

2957.—KILLARNEY.

Your Incubator has given complete satisfaction. Anyone who follows the directions given in your book is sure to be successful.

2958.—OAKHAM.

I am very pleased to be able to speak of your Champion Incubator in the highest terms, both for simplicity of construction and successful working.

Your Foster Mother is equally good, and provides, I consider, a most perfect means of rearing chickens.

In making the above statements I speak from my own personal experience in the matter, as my first attempts at hatching and rearing chickens were of the most disastrous nature.

Having invested in an incubator on the circulating hot-water principle, and a rearer to match, my troubles began. To say nothing of the time and attention it required, I found it impossible to keep the drawer at anything like a regular temperature, which varied in the most distracting way four or five degrees too much or too little. I lost eggs without number, and ended by hatching only 10 chickens, which came out one at a time now and then; six only of these survived, the rearer proving fatal to the other four. Since that unlucky time—nearly two years ago—I never tried artificial incubation again until last spring, when I purchased one of your 50-egg Champion Incubators and a Foster Mother, which proved all I could wish. In one experiment, out of 26 fertile eggs 22 chickens hatched, all of which I reared in your Foster Mother, during a very cold March, without any trouble.

I shall be most happy to recommend your Incubators to any intending purchasers.

2959.—BASINGSTOKE.

With much pleasure I offer two years' testimony in favour of your ingenious Incubator. Through its instrumentality a far higher average of successful births is secured than when eggs are left under the charge of a natural mother, during early spring especially, when protection against sudden change of temperature is so all-important. To the game preserver it is peculiarly valuable. Here we now invariably finish off in the **Champion** all "mown-out nests," whilst our "spring chicks, ducks, geese and pheasants," under its genial influence burst into life with the regularity of clockwork.

2960.—OLD HILL.

I am more than satisfied with the result, having obtained a much higher peroentage of chickens from the Incubators than from the **hens.** The even temperature which your Incubators maintain is very perfect. I do not wish for any improvement.

2961.—ILMINSTER.

I have had a 50-egg Incubator of your make in constant use since December last, and find it quite as successful as a machine can be. I hatch about 80 per cent. of fertile eggs—14 per cent. are addled and 6 per cent. dead in shell; this is as nearly as I can make the average of all the registers I have kept. I very rarely have a cripple, though every now and then there is one malformed, which is, of course, no fault of the Incubator.

2962.—BLANDFORD.

The No. 6 Incubator I purchased of you last January has given me the greatest satisfaction, far beyond anything I anticipated. I have hatched in it this season over 100 turkeys, 150 chickens, and 130 ducks, besides a few guinea-fowls and "one gosling." But I only put in **one** goose egg, as the drawer was full. The Incubator is very easily managed, and so regular was the temperature that I did not keep a register after the first three weeks, and it hardly varied one degree the whole season.

2963.—INVERURIE.

I am well satisfied with the Incubator I had from you, having found it all than you profess it to be.

2964.—HATHERSAGE.

I have much pleasure in speaking in favour of your Incubators, as I have been very successful with them. We failed previously with Incubators of two other makers. In yours, from 50 pheasant eggs we hatched out 41 strong and healthy birds, and we had similar results with hen eggs.

2965.—BELFAST.

The Incubator I had from you in the early part of the season has indeed "solved the problem." **Every fertile hen egg hatched**. I have much pleasure in testifying to its simplicity and regularity of working.

2966.—BETTWS-Y-COED.

Eighty-five per cent. have been hatched out of your 50-egg Incubator. It and the Foster Mothers of both kinds have been eminently satisfactory.

2967.—CANTERBURY.

I have had two of your Incubators in use this season, and have hatched out chickens, bantams, and pheasants, and the percentage obtained has been highly satisfactory.

2968.—SOUTHPORT.

It will be gratifying to you to know that I have worked your Incubator with complete success, every fertile egg hatched, following implicitly your directions. I hope to be able to give you another order next spring. In the meantime I shall strongly recommend the "Champion" to my friends in Southport.

2969.—CUMBERLAND.

Your Champion Incubator appears to be as near perfection as it is possible to attain. The one I have never varies at the most above one degree, and the hatching result surpasses my most sanguine expectations. You may justly claim the right of having "solved the problem," and deserve the thanks of the poultry fancy, but more especially the **orders** from those who intend going in for artificial incubation.

2970.—MONMOUTH.

I have much pleasure in telling you of my success with your Incubator. I have found it very little trouble. I hatched 18 chickens from 19 good eggs (six of the 25 eggs put in having been taken out clear and used for cooking), and I have reared 17 of them. They are remarkably strong, healthy chicks.

2971.—DIDCOT.

I have very great pleasure in writing to inform you the Champion Incubator I bought of you in January last proved very successful, and is all we could wish.

We have had no trouble with it, and should certainly recommend it to anyone wishing to purchase an Incubator.

2972.—MILLPORT, N.B.

The Incubator I purchased from you has given me thorough satisfaction. In July I placed 80 eggs in the drawer, and of these 60 were hatched, one only of the 60 being deformed; of the remaining 20, 10 were unfertile, and the others not strong enough to break the shell. I never obtained results at all approaching to this with . . . . . Incubator, which I had tried before, and the trouble which the latter gave was very great in comparison with yours in keeping up the right temperature in the drawer.

2973.—BURTON-ON-TRENT.

It is with great pleasure that I bear testimony to the wonderful results to be obtained by your machines.

I have not found the least difficulty in keeping the heat at 104°, but I consider 105° the best temperature to work at. You will see by the undermentioned results that I have found your Incubator to be a complete success. From the first 30 hen eggs I obtained 24 strong, healthy chickens; from 42 duck eggs, 39 ducklings. I have just hatched the last lot for this season, and have only got 18 ducklings from 27 eggs. This is the least percentage I have had; but I can easily account for it, as some of the eggs were old-laid ones. If you think well to insert the following plan in your next issue, I think you will hear little or nothing of birds dead in shell or cripples: Instead of turning the eggs completely over from one side to the other, take a cup containing a little warm water, and dip your forefinger into it and so roll the eggs over, taking care to leave the eggs a little more elevated at the thick end, as I find that prevents the birds from chipping the shell at the wrong place. Be sure to turn the eggs before trimming the lamp, or the paraffin oil will prove injurious, if not fatal, to the chicks. if you turn the eggs with any adhering to your fingers.

[ED.—There is some advantage in keeping the larger end rather higher than the other, as suggested by our correspondent.]

2974.—MOSES GATE.

The Hearson's Champion Incubator has proved satisfactory in every respect.

2975.—WALLINGFORD.

I am pleased to be able to give you a satisfactory account of the working of the 200-egg Incubator purchased of you. I have hatched out a great many strong and healthy chickens, which do wonderfully well in your Foster Mothers. On the 3rd of February I placed in the Incubator 54 eggs, which were all laid that and the previous day, and on the 22nd of February I saw some of the eggs were chipped. Next morning I found several hatched, and the following morning, Feb. 24, every chick was hatched, making 54 chickens from 54 eggs. I have often hatched 80 per cent. I burn gas, and did not once alter the height of the flame during the three weeks. The Incubator did not vary more than a degree the whole time.

I have recommended two or three of my friends to purchase your Incubators in preference to other makers, and they all say they have had wonderful success in hatching ducks and chickens.

2976.—COLCHESTER.

The 50-egg Incubator I purchased of you last November has done its work well I have had excellent results with very little trouble. We shall see very few sitting hens when people find out the good qualities of your Incubator and Rearing Mother.

2977.—SALISBURY.

I have found the Champion Incubator **most** successful. I managed it and the Foster Mother entirely myself for the first three months; then, as I was leaving home, sent it to the farm, where it has also been most successful. I secured finer chickens than from the same eggs put under hens. I think a second Foster Mother is required to separate the different sized chickens.

2978.—UXBRIDGE.

With regard to my competitive hatching trials with hens and Incubator. On the 11th of March I promised one of your No. 6 Incucubators and a No. 7 Hydrothermic Foster Mother. I started with my Incubator business on the 14th, and have had three hatches. The results are: Hens—Set, 52; unfertile 9; addled, 14; dead in shell, 0; hatched 29. Incubator—Set, 140; unfertile, 36; addled, 3; dead in shell, 6; hatched, 95.

The Incubator is all one could wish for. The air in the hatching-room in March was at 40°, and the Incubator egg drawer at 105°, and in May the air in room was from 43° to 60°. and I started working at 104°, and had no trouble to keep the Incubator at that temperature. The great thing is to have plenty of water in water tray.

My chicks hatch out very strong; in fact I have only lost two chicks to present date, and shall not set my hens again, as the man prefers to attend to Foster Mothers much better than thirty or forty sitting hens, and we shall not lose any by hens treading on them, which they all do more or less when cooped.

With regard to Foster Mother, it answers very well. I find no trouble in keeping it at from 90° to 100°; in fact, the chickens, after the first few days, sleep just outside their bedroom, in the glass run, and have left the Mother when five or six weeks old.

2979.—NURSLING.

I beg to say that I have been using one of your 50-egg Incubators in my yard for the first time this year with very satisfactory results. I have hatched a great many broods with it, and find it easy to work, and the temperature wonderfully uniform. With one sitting of eggs I had 50 chicks come out.

2980.—FIFE.

I have pleasure in testifying to the efficiency of the Champion Incubator supplied to me in the end of last year. It was started on 21st December, and regulated to a temperature of 102½°, which it maintained within about one degree for two months.

At first the full 100 eggs were put in the drawer, **and the result in chickens hatched was far from satisfactory—only 16 per cent.;** but the eggs had been both carried a distance and kept a considerable time. The next trial gave better, but still unsatisfactory, results. These experiments were carried out here under my personal supervision and according to your instructions, but I do not attribute the failure to the machine.

After this the Incubator was removed to my farm near, and left in charge of the dairymaid. **The first trial resulted in 50 per cent. of chickens** from

eggs which had been collected on the farm and kept for different periods, not exceeding a fortnight. This was satisfactory for a first trial by a novice at artificial hatching: but since then, up to the present time, the plan has been adopted of **always putting new laid eggs in the drawer—a dozen or more at a time—and the success has been complete. Lately, eleven chickens from the twelve eggs has been the average, sometimes the whole twelve being hatched.**

The Incubator has been kept going since February last, and the fact that at the present time such results are obtained proves conclusively the wisdom of our method and the efficiency of your machine.

No record is now kept of the temperature, &c.; each dozen of eggs being marked with the date only.

The chickens are healthy, and can't be distinguished from their neighbours hatched and reared by the hens.

2981.—CAMBERLEY.

I have used your Incubator since March last, and have come to the decision that for hatching, it equals hens and is much less trouble. The young chickens are in every way as strong and healthy as others.

2982.—WHITEHAVEN.

The Honourable Mrs. ——— is glad to inform Mr. Hearson that she has had a most successful trial of his Incubator. Out of 12 eggs 11 hatched. The birds are very strong and doing well in the Foster Mother. She finds the Foster Mother much better than a hen.

Before the artificially-hatched chickens came out she put a brood in it, instead of leaving them with their natural protector. They grew more quickly, and are the most independent chickens she has ever seen.

2983.

The Incubator supplied to Mr. ——— has been a great success; in fact, much greater than we anticipated. It was started on Good Friday, and after testing the temperature for 24 hours, we put in 40 hen and 10 duck eggs. On the 20th day we had 38 chickens, and in due time four ducks.

Since that it has been kept going till last month, hatching us altogether nearly 300 chicks, ducks and guinea-fowl. We have had no trouble in any way—the temperature varying so very slightly.

2984.—CHRISTCHURCH, NEW ZEALAND.

The Incubator and Foster Mother duly arrived in very fair order, and I am glad to report are answering admirably well.

After filling the tank of the Incubator (which I did at 8 a.m. on August 9th), I within 10 hours put in about 50 eggs, and all has since gone well without a single hitch. It took one nearly three weeks to fill the drawers; but, notwithstanding, I have already hatched out close on 300 chickens and ducklings. The average all round has been over 80 per cent. of fertile eggs. The duck eggs, which I bought, were only 50 per cent., while the hen, which were all from my own stock, have turned out over 86 per cent., although a number of them are pullets' eggs. This over two months' trial certainly passes my expectations. The Foster Mother also answers very well. With several lots hatched by hens (from which I have taken the chicks when about a day old and put in the Foster Mother), I have passed through or have still in about 350, of which not more than a dozen or fourteen have died at most, and by far the greater number of these were defective or deformed when hatched.

A neighbour imported a machine shortly after mine came to hand, and he has had nothing but trouble with it. He has seen mine and thinks it far superior.

Altogether, I am exceedingly well pleased with the way in which the machine, &c., works.

2985.—DONERAILE.

I am happy to inform Messrs. Hearson & Co. that the Champion Incubator, and also the Foster Mother, are working most satisfactorily. I am sorry that I did not get a 200-egg instead of the 100-egg one.

2986.—BLACKPOOL.

In my opinion the Incubator is a wonder of simplicity, durability and efficiency. It works with such regularity that I have long since ceased to keep a register. In feeding early chicks I find that canary seed and rice pudding made of milk. and with a little butter and sweetened, does better for the first week or two. With best wishes for the spread of your incubator.

2987.—TANSLEY.

We have hatched geese, ducks, fowls, pheasants, grouse, plover, and thrush, besides many other kinds of wild birds, and in all cases found them to come off stronger and better than when hatched naturally.

I think nothing could exceed its beautiful working. We have tried others, more particularly . . . . . which did very badly, in fact, was a nuisance to work, and spoilt us several hundred eggs.

2988.—BRISBANE, AUSTRALIA.

We sent for one of your No. 20 Incubators as an experiment. It arrived at the end of January, but, for various reasons, we were unable to use it until March. We consider the trial satisfactory, and intend in future to use no Incubators but yours.

We request you to send us three more like the one we have.

Please find enclosed a cheque for £72 5s., which, according to your published prices, is the price of three Incubators, with Foster Mothers of corresponding size.

2989.—CHORLEY, LANCASTER.

I will have no more hen sitting.

2990.—TOWNSVILLE, QUEENSLAND.

The No. 11 Incubator you sent me a short time ago has given me such undeniable satisfaction that I have much pleasure in ordering, through my London agents, three of the same capacity and one No. 20.

Hoping to see numbers of your most useful and valuable inventions finding their way out here.

2991.—SEVERN STOKE, WORCESTERSHIRE.

I have hatched 97¾ per cent. of the good eggs in my Incubator this week.

The Foster Mother is a great success.

2992.—BUSHEY, HERTS.

I am sure you will be glad to hear that I have been very successful with my second attempt at hatching in your Champion Incubator. From 50 eggs I have just had 42 very fine, strong chickens ; four eggs were unfertile, and four were dead in shell.

They began to chirp on the morning of the 20th day. I wish to express my pleasure and satisfaction with your Incubator.

Among the chickens there is not one weakly one, and they are getting on beautifully in the Foster Mother.

2993.—PIETERMARITZBURG, NATAL.

The Incubator is doing splendidly, and I have shown and recommended it to friends ; and although the temperature yesterday in the room was 96°, the Incubator remained steady between 104° and 105°.

2994.—HANWORTH, S.O., NORWICH.

I send you my first trial with your 25-egg Incubator ; I look upon it as a great success. Your machine is certainly a perfect marvel of simplicity, and its regularity and control of temperature is something wonderful. It may be said to be almost too perfect in every respect.

2995.—CROOM, IRELAND.

Mrs.———'s compliments to Mr. Hearson, and begs to inform him that she has found his Incubator perfect. She has had it in constant use for two years, and has just had a brood of 41 chickens out of 56 eggs.

2996.—BICKLEY, IPPLEDEN.

The Incubator and Foster Mother you supplied me with in March last have given and continue to give me entire satisfaction. The first hatch I had was 90 per cent. of fertile eggs, the second just over 80 per cent. Since then I have not taken particular notice, as the machine does its work so effectually.

I am very much in favour of the Foster Mother, which I consider superior to a hen for rearing.

2997.

Lady——'s compliments to Mr. Hearson, and she begs to know whether he would sell her two of his Incubator Capsules. She bought a 200-egg Champion Incubator this year from Mr. C——stone, and finds the regulator works so admirably that she is anxious to try the same plan of ventilation on two Machines of M——'s which she has had for some time, but has never been able to get the regulators to work.

Lady ——got 103 healthy chicks out of Mr. Hearson's 200-egg machine the first time of working it.

[EC.—The names and addresses of the parties referred to in the above testimonial are suppressed for obvious reasons. If we could afford to invent for the love of it, and without any mercenary motives, we should have much pleasure in assisting those who have had unprofitable experiences. Under the circumstances, however, we are compelled to decline to supply capsules, and it should also be borne in mind that to use one of our capsules in any Incubator other than our own is a felony.]

The following have been extracted from our ordinary Correspondence since the issue of the Seventeenth Edition.

(See end of Testimonials.)

2998.—PRESTON.

Your Incubator works wonders. I will guarantee to hatch 90 per cent. out of fertile eggs any time with it.

2999.—DISS.

We hatch from your 100-egg Incubator in batches, and often realise cent. per cent.

3000.—ETCHINGHAM.

We hatched about 700 chicks with your Incubator last year in six months—95 chicks from 100 eggs.

3001.—WINGHAM.

During my absence a drawerful of duck eggs had been left out of Incubator for 12 hours—they had been in 10 or 12 days. Of course they got thoroughly cold ; but, as I was advised. I put them back on the off chance of hatching them. I now write to tell you that the whole setting of 12 duck eggs have come out fine, strong birds.

3002.—STAPLEHURST.

I had 56 strong chickens, which is exceedingly good, amounting to 93⅓ per cent., and testifies to the superiority of your machine to those of other makers ; for I have tried other kinds for some little time, but never had the success I have had with yours.

3003.—MANCHESTER.

I like your machine very much indeed. It hatched 24 chicks out of 26 eggs.

3004.—RYDE.

I last year used your 50-egg Champion Incubator with varied success. On the 17th last April (1885) I put in 47 eggs, amongst which were 16 Pekin duck eggs, four turkey, and the remainder chicken and bantam eggs. Out of that number I had 16 ducks, four turkeys, and 18 chickens ; the other nine were addled. The turkeys were the finest I ever raised—so strong and healthy. At the age of three months they weighed 10 lbs., and at ten months the youngest Champion Stag took Second Prize at the Ryde Poultry Exhibition, which took place January 27th, He weighed at that time 25 lbs. I had previously tried ——— Incubator without any success whatever. With this experience I have the greatest pleasure in testifying to the complete success of your Incubator.

3005.—MIDDLESBRO'-ON-TEES.

No one can make any complaint as regards Incubator or Rearing Mother. Both are perfect in every way.

3006.—MALDON.

You will be glad to hear that the excess of heat did not interfere with the hatching of turkey eggs, as every one has duly hatched.

3007.—BECKLEY.

I hatched about 90 per cent. the first time with your Incubator, and am very pleased with it. Some of the eggs were a fortnight old.

3008.—LEICESTER.

Fifty eggs—seven unfertile, two chickens dead in shell—41 healthy chickens.

3009.—JUNIPER GREEN, N.B.

I started the Incubator three weeks ago with 18 eggs, of which 15 hatched yesterday.

3010.—AUCHENDENNAN.

I am glad to report the complete success of the 100-egg Incubator purchased from you last February. It was about half filled with Dorking eggs in the first instance, and filled up when more eggs were collected about ten days later. Of the fertile eggs in first lot 87 per cent. were hatched, and of the second lot 91 per cent. The Hydrothermic Foster Mother is all that could be desired.

3011.—WALTHAM ABBEY.

I find your machine acts capitally, having had several hatches of over 90 per cent.

3012.—WORTLEY LANE.

We have had good results with our first hatch, just 80 per cent.

3013.—CELBRIDGE.

Seventy-one pheasant eggs—12 unfertile, four addled, four dead in shell—51 hatched.

3014.—LAMBOURNE.

I have used one of your Incubators (No. 6) for four years with great success, and never allow a hen to sit. I hatched 42 chicks out of 46 eggs on the 21st of February.

3015.—LIPHOOK.

A friend of mine told me he was using one of H——'s Incubators, and I was thinking they appeared more convenient than yours, but after the hatch I had last week out of one of your 100-egg Incubators, I shall never change. Every fertile egg hatched but four.

3016.—AUCKLAND, NEW ZEALAND.

Two months ago I purchased one of your Incubators (No. 6) from Lassettet, ironmonger, Sydney. I purchased 50 eggs from a neighbouring dairy, and placed them in the Incubator. On the seventh day I examined the eggs and found five unfertile; the balance (45) produced 45 healthy chickens.

3017.—HENLEY-ON-THAMES.

I am hatching cent. per cent. of good eggs, and up to the present have had no hitch with the machine.

3018.—GLASGOW.

I have recommended a few fanciers here to try your machine.

3019.—ALMONSBURY.

I may mention that the Incubator has answered perfectly, hatching fine, strong chickens all through the year. At one time 24 strong chickens were hatched from 25 eggs.

3020.—AITTESCHELL.

Fifty-six eggs put in—four unfertile, two addled, one dead in shell—49 have come out, all good, perfect birds.

3021.—EALING.

I have been most successful with the Incubator I purchased from you, hatching out 90 per cent.

3022.—MANCHESTER.

I have worked one of your Incubators for His Grace the Duke of Marlborough, and obtained the capital result of 90 per cent., a much larger percentage than I ever obtained before from any other maker's machines, and I have worked many.

3023.—ASHFORD, CO. WICKLOW.

I placed 16 eggs in your No. 11 Incubator, the result being four unfertile eggs and 12 chickens hatched out and doing well. On the 9th of April I placed 75 eggs in the drawer, the result being 66 chickens hatched, two eggs broken (by me) and seven unfertile. What more could one want ?

3024.—LLANARTHNEY.

I may say I have tried Incubators before, but never had such success as with this one, and the Rearing Mother is perfection, as it does away with hot water.

3025.—BURNLEY.

I purchased from you some little time ago a No. 6 Incubator with copper tank, which has given me every satisfaction, beating my sitting hens most shamefully. I have the "Climax," offered at 20 per cent. off, but do not like the incubator at all, it having no certain regulator.

3026.—BECKLEY.

I have now given your Incubator you sent me in November, 1886, a pretty good trial, and, with the exception of about six weeks in August and September, it has been in constant work. I have had wonderful success. Just at first I kept an account, and found that we brought forth about 90 to 93 per cent. chickens, turkeys, and ducks. Nineteen eggs I had sent me from Toronto, in Canada, 17 put into the machine, and hatched five chickens. Good work, I consider, after the distance they had travelled.

3027.—LAMINGTON.

Hatching at the rate of 80 per cent. of both hen and duck eggs.

3028.—SCARBOROUGH.

A year or two since I tried a C—— Thermostatic Incubator, which proved a dismal failure ; then I bought a H——, through the Poultry Agency, Chancery Lane, with the understanding that, if unsatisfactory, this should be changed for a Hearson. The H—— was quite as unsatisfactory as the C——, and now I have a 50-egg Hearson, which I like very much.

3029.—CLITHEROE.

I have worked the Incubator very successfully for three seasons, and should not now like to be without one. I think your make perfect. I have seen many others at work, including H——'s, but think yours still the best.

3030.—MANCHESTER.

I am quite sure none can equal your machine for simplicity and efficiency, and I could not do anything else but recommend them to everyone that is in need of anything of that description.

3031.—LIVERPOOL.

In my first hatch I brought out 38 chickens out of 46 eggs, I may add that I am thoroughly delighted with the way that the Incubator and Foster Mother work.

3032.—LIPHOOK.

I have sent away six dozen eggs, all "White Leghorns," and laid since last Thursday. Have just hatched out 81½ per cent. of eggs put in one of your Incubators.

3033.—HASTINGS.

Hatched all my prize birds last year with your No. 6 Incubator.

3034.—ORMSKIRK.

I am highly pleased with your Incubator. All fertile eggs came out.

3035.—ROMFORD.

Your No. 11 Incubator which I purchased I find everything anyone could wish for, as there is really no trouble attached to it whatever in keeping the drawer at any temperature one wishes for; it is perfection in every way. I shall be happy to recommend to my friends the Champion, as it I think justly claims that title.

3036.—WAKEFIELD.

It may interest you to know that my 50-egg Incubator has the same capsule in it now that it had in when I bought it six years ago.

3037.—YORK, WESTERN AUSTRALIA.

The average hatching has been about 80 per cent.

3038.—HARLOW.

I hatched 28 out of 35 fertile eggs, and the chickens are all extremely healthy and well, which is satisfactory, considering the extreme coldness of the weather.

3039.—THETFORD.

The Incubator you supplied me with works most satisfactorily. I have hatched 27 out of 28 fertile eggs in my first attempt.

3040.—COLCHESTER.

I consider your Incubator and Rearer invaluable. My Plymouth Rocks, winners of Cup and Medal Dairy Show, 1st, 2nd, 3rd and 4th Palace, were all hatched in your Incubator and reared in your Foster Mother.

3041.—BECKLEY.

The Incubator you sent me two years ago hatches almost every egg that quickens. One or two of my friends, who have tried H——'s, have given them up; there is too much heat escapes into the room.

3042.—EAST HOATHLY.

I was successful in my first venture in hatching 18 chickens out of 22 fertile eggs.

3043.—STOCKPORT.

I put in 44 duck eggs on the 16th of last month in the evening, and last night I had 36 of them out alive and well. Four of the eggs I thought were no use before I put them in, and none of the four came out, so that it is as good as having 36 out of 40.

3044.—THETFORD.

The first Incubator hatch was a grand success—42 eggs put in, 14 unfertile on 7th day. Result, 27 out of 28 fertile eggs.

3045.

I hatched out every egg that was good stronger than the hen—no cripples.

3046.—BIRKENHEAD.

I like your Incubator very much; it may fairly take rank as a great invention It is quite possible that I may require three or four of 500 eggs each.

3047.—DONCASTER.

The lamp of our Incubator was taken out to be trimmed the other day at 8.30 a.m. and then forgotten; it was not till about 9.30 p.m. that the omission was discovered. The eggs had been put in just a week. As they were by no means chilled, the Incubator was kept in operation, the result being as good a hatch as we have had this year.

3048.—BARNSLEY.

The first hatch with No. 6 Incubator I got from you rather more than three weeks ago, is completed, with the following result: 93·6 per cent.

3049.—YORK.

I find eggs hatch out much better at a higher temperature than 104°. Last week from 52 eggs hatched out 45 chickens; the other seven eggs were unfertile.

3050.—BINGLEY.

I have never had any trouble yet with your Incubator, and you will see by your books how long I have had it; and scores of people round here have been to see it. In fact, I do not use hens for sitting at all.

3051.—SPALDING.

The results, low as they are, are much better than I obtained from hens in 1888, which was the worst hatching season I remember in about 16 years' experience, and was amongst the causes of my investing in your Incubator (No. 11) last February, and which I should not now like to be without, for I consider a small one would be a great boon to many, if only to hatch the chickens in after the hens have chipped them, as it would save a great many from being trampled to death. After reading the "Problem Solved" I did not expect the machine to be much trouble to work, and I may say that it was even less than I expected, and I used less oil than you state, for I got as low as 5d. per week, using only about 3½ pints per week in April. Many of my friends doubted if the fowls would be as good, I may say I never had a finer lot of pullets, or more eggs, for in November 60 pullets and 20 hens laid 833 eggs, which were sold for £4 12s.

3052.—ROXBURGH, N.B.

The Incubator has been very satisfactory, and I have had good hatchings of ducks, turkeys, and chickens.

3053.—LOCHWINNOCK, N.B.

I have had such success with Messrs. Hearson's 50-egg Incubator that I now wish I had got one for 100. Messrs. Hearson may be interested to know that the Incubator of theirs which I sent to the Canary Islands in the summer is working splendidly.

3054.—WAKEFIELD.

I have now a 200-egg Incubator of yours; it answers very well, and we reared nearly 500 chickens this year. I find pullets reared and hatched artificially are better layers than those hatched naturally.

3055.—WHITCHURCH.

Twelve degrees frost. We are hatching out chickens with great success in this weather, and have not had any deaths in Foster Mother. We feed at night—a meal by lamplight at 10 o'clock.

3056.—BOMBAY.

It affords us great pleasure to inform you that your highly praised Incubator, bearing No. $\frac{1}{3051}$, that you were kind enough to forward to us about eighteen months ago, has given us complete satisfaction in every respect, and we are pleased to state that we have succeeded in hatching out 85 per cent. of good and fertile eggs of either fowls, ducks, or turkeys with your Incubator.

3057.—LANCASTER.

Your Incubator, which I bought this spring, has been a great success in every way; and as long as I am breeding prize chickens I will always use one.

3058.—BADEN.

The Incubator I purchased of you last August came to hand safe, giving you great praise for your careful packing, as every part arrived in good condition. You will be pleased to hear that the first hatch of chickens has been a success.

3059.—FORMBY.

Out of 30 eggs we got 26 chicks, the last but one hatching.

3060.—NORWICH.

I have had extraordinarily good results, nearly every fertile egg being hatched both this year and last. I should like to change a new H—— for a good one of yours, the same size as the one I have—viz., 100-egg.

3061.—TULSE HILL.

I may tell you we have had very good results with the Incubator; it hatched 11 goslings the first week in November out of 12 eggs.

3062.—EDINBURGH.

I have pleasure in stating that I consider your Hot-water Foster Mother a great improvement on your hot-flue, and, I may add, the best Foster Mother of which I have any knowledge. Perhaps I may also add your Incubator has worked most satisfactorily, and I shall have pleasure in recommending both.

3063.—BOMBAY.

Your No. 6 is giving great satisfaction.

3064.—MANCHESTER.

The Incubator is a complete success, and beats hens for hatching "all to fits."

3065.—FIFE, N.B.

I shall be much obliged if you will send me, as soon as possible, one 250-egg Incubator. I have two by other makers, but don't like them, and mean to get rid of them.

3066.—MELTON MOWBRAY.

Sold my H——'s Incubator more than a year since.

3067.—HEREFORD.

I am now using my little 25-egg Incubator for the third season. I am in every way perfectly satisfied. I have had much pleasure in recommending your Incubator to my friends for their pheasants. We hatch pheasants, quails, ducks, and fowls.

3068.—KNUTSFORD.

I like your Incubator very well. No gamekeeper ought to be without one.

3969.—SWAFHAM.

$\frac{11}{97}$ $\frac{97}{1735}$ Have just had a splendid hatch out of that Incubator—78 chicks off, three dead in shell; 33 eggs were unfertile. Total eggs in drawer, 114; so hatched 78 out of 81 possible eggs. My ducks are doing splendidly under Foster Mother. Have about 400 off now.

3070.—ALDERSHOT.

I should like to send you the following successful result with one of your 50-egg Champion Incubators lent to me. I put about 25 eggs into the Incubator. On the third day I forgot to shut the drawer—it remaining open about three hours. One egg, which I temporarily removed, I forgot to return until it had been out 16 hours. On the eighth day I left the drawer open accidentally all night (10 hours), so that the water in the tank became so hot that the drawer went up to a heat of 107° and 108°. having constantly to be opened to get cool, Notwithstanding these disasters, only two chicks were dead in the shell, and the remainder, including the before-mentioned egg, hatched out strong and healthy several hours before due.

3071.—NEWPORT.

I have hatched out and dried the pheasants most successfully this season as well as previous ones. Many eggs which the hen would have left in the nest through impatience to get away with the first hatched ones, have produced birds in the patent Incubator.

3072.—MALMESBURY.

I found your "Eureka" meal most excellent for turkeys, chickens, &c.; far better than anything I can get here.

3073.—MILFORD HAVEN.

The Incubator is a great success. I have used it now for five seasons, hatching many hundreds.

3074.—BOTLEY.

I am having an excellent hatch. This is the 20th day, and by now, 2 p.m., 29 chicks have come out, and nine more have chipped, out of a possible 44 or 45 eggs

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3075.—RIPLEY.

I regret I did not take your advice, and go in for a machine for 50 eggs.

3076.—BERKELEY SQUARE.

I was very pleased with your wonderful Thermostatic Nurse, and it suited my little baby girl so well. I am going to make it a present to Dr. ——— for his hospital.

3077.—ALEXANDRIA.

I have the pleasure to inform you that I am in charge of one of your Champion Incubators (No 6 for 50 eggs), which is continually working at the estate of H. E. Draneht Pacha's, at Kafr-Dawar (Egypt), the results of which I have found very satisfactory. It works always perfectly well.

3078.—RYDE.

I have a successful hatch this week; 86 per cent. (fertile eggs) from hen eggs, and 100 per cent. from duck eggs.

3079.—BRIGHTON.

I have just had two hatches of 84 per cent. Very good considering my many disadvantages.

3080.—MALMESBURY.

We are most successful with your 50-egg Incubator in bringing out chickens. The last hatch was 48 live and healthy birds out of 55 eggs put in.

3081.—MONAGHAN.

I have just hatched out of your new Incubator for 100 eggs, 87 beautiful chickens. I put in 110 eggs, and tested them on the ninth day, and took out 10 bad ones, which I replaced, so I am extremely pleased with the Incubator.

3082.—CANTERBURY.

I have just hatched 19 birds out of 23 eggs.

3083.

I have done wonders with your Incubator, and beat sitting hens out and out, and find especially that the chickens are very much stronger than those brought up under hens. Especially with turkeys I have had good results, and I now hatch all my turkey eggs with the Incubator.

3084.—ADLINGTON.

I send you result of my first venture of hatching with Incubator, and may say I am very much pleased with the machine.

3085.—HAWICK, N.B.

I have had very great success with one of your Incubators this year. In fact, I have, I may say, been absolutely successful, my second and third each yielding 100 per cent.

3086.—LEEDS.

The Incubator I got from you last year gave thorough satisfaction. In July we placed 100 eggs in the drawer. We brought 80 fine chicks out, 16 unfertile. We had not got a Foster Mother, so had to put them to hens, and the result was they killed us a deal of chicks.

3087.—RIPON.

The Incubator worked splendidly last year. I hatched both chickens, ducks, goslings, and turkeys very satisfactorily.

3088.—RUSWARP.

Please send 1 cwt. of your "Eureka" chicken meal; it is the best I have ever used. A relation of mine hatched 200 Incubator chickens last year, and reared them all on your meal, never losing one.

3089.—BARNSLEY.

The Incubator hatched 86·8 per cent.

3090.—TOPSHAM.

My chickens were strong and healthy. The last I hatched in July (buff Cochins) every egg came out, and have lived brought up in the Foster Mother, and are like small turkeys now. Eggs forsaken by hens I saved in my Incubator

3091.—CHURCH STRETTON.

I have made several inquiries, and have been inspecting an Incubator you sold near Onibury, and feel sure that yours is the best make.

3092.—MOFFATT, N.B.

I received the Incubator and Foster Mother all right; hope it will work as well as the one I have been working for three years, as I could hatch out every egg with it.

3093.—PONTEFRACT.

It may be satisfactory to you to know that since adjusting your Incubator, on receipt two years ago, I have never had to meddle with it. It begins with each new season where it left off the previous year, and goes like clockwork.

3094.—DODDINGTON.

My Incubator is working splendidly. On Monday it hatched 82 per cent. chicks, which is wonderful for this season, all strong and healthy.

3095.—STILLORGAN.

A fortnight ago, on the 27th day of hatching, the entire drawerful of duck eggs (34 in all) came out all right and together, leaving the drawer full of shells, without a single accident.

3096.—BOSTON.

I have been very successful with your Incubator, and have recommended it to all my friends. I find I can hatch 46 out of 50.

3097.—FRAMLINGHAM.

I have tried H——'s and F——'s Incubators, and must pronounce them both failures. Of yours I have not yet read one depreciatory sentence nor heard a complaint.

3098.—MORPETH.

I purchased an Incubator from you last year, which has given entire satisfaction, hatching over 90 per cent. on three trials. I got two Foster Mothers of your make, which are giving great satisfaction, and it is my intention to rear all I produce in the natural way by your machines.

3099.—MARLOW.

I was a total disbeliever in a Foster Mother, but am now quite converted, as the brood I put in a month ago are doing so well, and not one died, although most of them are coloured Dorkings, and all Dorkings are reported far from robust.

3100.—CRICKHOWELL.

I am glad to inform Messrs. Hearson that, out of 50 eggs brought from the farms round here, of no particular sorts, the Incubator I purchased last month hatched 29 chickens on the 13th and 14th inst., and all are doing splendidly in the Foster Mother.

3101.—BRACKNELL.

Please send 1 cwt. "Eureka" poultry meal; I find chickens do better on that than anything.

3102.—NORTHWICH.

I consider the Incubator and Foster Mother a great success, as on the first attempt we got 20 out of 25 eggs, five being unfertile, not one dead in the shell, and they appear to be far stronger than chickens hatched under a hen.

3103.—BATH.

I daresay you remember my buying a 100-egg Incubator from you, I suppose three years ago, or more probably. We hatched out the other day every possible (fertile) egg.

3104.—READING.

This year the Incubator has hatched more than 75 per cent. of eggs put into it

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3105.—ASHFORD.

It will be some satisfaction to me to supply eggs for your Incubators, as I know they give such good results, so different from other makers. I have tried H——'s, C——'s International, and find them very inferior to yours.

3106.—OXFORD.

In the last lot of eggs hatched, in one set I got 13 chicks out of 15 eggs.

3107.—PORTSMOUTH.

I safely received the No. 2 Incubator, and although I had never seen one of any kind, I had it in working order a few hours after reading your instructions. I then placed 26 eggs in the drawer, and the result of the hatch was 19. Of the seven not hatching, three were unfertile, two broken yolks, and two addled. I may add the eggs used had travelled 200 miles.

3108.—CHERITON.

The hatch is just finished. Hatched 53 chicks out of 56 eggs, and all alive and strong.

3109 —DUNEDIN, N.Z.

The machine has given every satisfaction. I have been unable to do anything with either of the two others which I purchased.

3110.—TENBURY.

I am pleased to tell you that I am delighted with your No. 6 Incubator. I put in 60 hen eggs, five of which were unfertile, one was addled, and one chicken dead in the shell. The remaining 53 are strong, healthy chiekens a week old, and doing splendidly in the Foster Mother.

3111.—ROTHBURY.

I may here inform you that I have been very successful with your Incubators, of which I have two working. On several occasions I have had a chick for every possible egg, and usually about 90 per cent.

3112.—DUMFRIES.

I find your Incubator a great success. I have 23 live chickens out of 25 eggs.

3113.

Put in 57 eggs, hatched 48. All strong chickens.

3114.—LEAMINGTON.

Every one of the fowl eggs put in hatched out.

3115.—STONEHOUSE.

I have sold £50's worth of chicks, a week and 10 days' old, from your Incubator the last 10 weeks, besides keeping some for myself.

3116.—STONEHOUSE.

I have sold nearly £100's worth of chickens hatched this season (since January) from your Incubator.

3117.—STONEHOUSE.

I have had some wonderful hatching lately from your machine—in several cases 96 out of 100 eggs.

3118.—RIPLEY.

Your No. 2 Incubator brought me out 100 per cent. in the coldest weather. First lot of chickens weigh between four and five pounds, and are considered excellent.

3119.—OSWESTRY.

Perhaps it may interest you to know that I hatched 80 chickens out of 100, in your machine, on January 23rd, and have at the present time 76 healthy, strong little chickens, which will be three weeks old to-morrow and Friday. I am also expecting another batch out on Friday or Saturday. I find both Incubator and Foster Mother capital. I consider all expenses of plant were cleared last year.

3120.—MALMESBURY.

I beg to enclose you my record of hatching in one of your Incubators, and I consider it quite wonderfull, as I got 31 fine, healthy chickens out of 33. They are all now in the Foster Mother, and appear to be doing well, though it is very cold and hard frost at night.

3121.—CHURCH STRETTON.

The Incubator I bought from you last year answers admirably. I have hatched as much as 85 per cent. of the fertile eggs.

3122.—MALTA.

The machine works very well—23 out of 24 eggs hatched.

3123.—LEOMINSTER.

I should be obliged for lowest cash price of 50-egg Incubator. I have tried H——'s, but can make nothing of it.

3124.—DUNKELD.

Eighty per cent. of fertile eggs were hatched in the Incubator on New Year's Day.

3125.—MALPAS.

I have just sold one of your 12-egg Incubators that I have had three years. It is in perfect order, and I have this week hatched 11 out of 12 fertile eggs.

3126.—NEW BARNET.

Your Incubator is a rare hand at bringing chickens out. In some cases we have hatched 100 per cent. of fertile eggs ; but the average, as far as we have gone, has been 97 per cent.

3127.—PORTSMOUTH.

I have just had a splendid hatch—every egg producing a fine, healthy chick.

3128.—BRIGHTON.

As I have been incubating year after year for some time, it seems only fair to tell you that your Incubator has fully borne out your advertised statements, and that I have never had the slightest trouble or difficulty with it.

3129.—CLOGHRAN.

I cannot give you too much praise and acknowledgment of the success of your Incubator No. 6, for 50 eggs. I find it successful in every case, hen eggs and duck eggs always two days before their time. Some goose eggs were hatched in 28 days, and all others in 30 days, 35 days being the usual time for hatching them. I also found the Foster Mother you sent me very successful.

3130.—CASTLE HEDINGHAM.

I have great pleasure in letting you know how successful I have been with your Incubator and Rearers. I have now over 300 chicks, and should have had nearly 400 but for losing a lot one week by a poaching cat when I was from home. I have hatched out, since November 21st, fully 90 per cent. of the fertile eggs, and have not lost five per cent. of chicks from cold, damp, or disease. I have now a lot of splendid spring chickens fit to kill.

3131.—TEWKESBURY.

I am glad to say that I can speak most highly of your Incubator. I have hatched all my prize winners (Plymouth Rocks, which have won most of the First and Special Challenge Cups for two years) in your Incubator.

3132.—NEWCASTLE-ON-TYNE.

I am happy to say that your Incubator has given me entire satisfaction. In one hatching last season I got 99 chicks out of 107 eggs.

3133.—LADYWELL.

I have been very successful, always hatching 10 out of 13. The Incubator is your make, No. 1.

3134.—TWYFORD.

I put 26 eggs in on the 7th, and to-day I have 19 nice chicks. The eggs were all pullets'.

3135.—NORTHALLERTON.

I am happy to inform you that the Incubator I purchased of you has proved very successful. Out of 48 eggs I hatched 39 chickens. They are now nearly three weeks old, and extremely healthy, strong chicks.

3136.—HAWKHURST.

I hatched out just upon 1,000 chicks last season, in eight months, with the 100-egg Incubator which I bought of you.

3137.—BOTLEY.

I have hatched 12 chicks from 14 possible eggs.

3138.—NORTHENDEN.

Will you be good enough to send me, as soon as convenient, a second of your No. 6 Incubators, the one that I had from you some two years ago having so far proved satisfactory.

3139.—TAUNTON.

Mrs. ——— thinks Messrs. Hearson will like to know the result of her first hatch : 49 eggs—6 unfertile, 2 addled, 9 dead—31 hatched.

3140.—WOOLER.

Mrs. ——— has been very successful in hatching, having 100 per cent. two or three times out of fertile eggs.

3141.

RESULT OF COMPETITIVE TRIAL BETWEEN HEARSON'S CHAMPION INCUBATOR AND ——— HOT-AIR INCUBATOR.

	Eggs put in.	Unfertile.	Addled.	Broken Yolk.	Dead in Shell.	Hatched.	Consumption of Oil in gallons	Percentage hatched	Consumption of Oil nearly double Hearson's.
Champion	29	9	...	2	3	15	1·8	75	
—— Hot-Air	29	9	7	1	5	7	3½	35	

N.B.—Further and more recent Testimonials post free, one penny, or gratis on application at 235, Regent Streeet.

EXTRACTS FROM THE PRESS.

"THE FIELD," *April* 8, 1882.

HEARSON'S CHAMPION INCUBATOR.

Those persons who have paid attention to the subject of artificial incubation, either from a practical or scientific point of view, are well aware of the narrow lines that separate success on the one hand from failure on the other.

The careful observations made some years since by our correspondent, Mr. Boyle, with an Incubator that, from its extreme delicacy of action might be regarded as a scientific instrument, proved the excessively narrow range of temperature within which practical success was possible, and also the necessity for close attention being paid to atmospheric conditions of dryness and moisture, and of exposing the upper and under surfaces of the eggs to different temperatures. Such being the case, **it is not surprising that those Incubators which provided for the renewal of the loss of heat by the supplies of hot water twice in the 24 hours have not proved the success that was anticipated, and that the makers are now reverting to the use of continuous sources of heat, in order to maintain an equable temperature.**

In the Incubator designed by Mr. Hearson, the regulation of temperatnre appears to be more effectually accomplished than by any other contrivance designed for practical use that we may have previously seen. The regulator precludes the possibility af an injurious rise of temperature (that most fatal of all errors), and once set in action it goes on without the necessity of frequent interference.

[*Here follows a description of the general construction of the "Champion Incubator," which, as it has already been explained in the foregoing part of this Pamphlet, need not be given again.*]

"THE FIELD," *May* 13, 1882.

HEARSON'S CHAMPION INCUBATOR.

Sir,—Under the above heading you published in *The Field* of April 8th a very good drawing and description of this newly-invented machine. I venture to think, therefore, that many of your readers will be interested to hear an account of the success of one of the first hatchings which has been accomplished by it.

You printed, on April 22, a letter from Mr. Thomas Christy, in which he appeared to me to display considerable feeling of jealousy towards an invention which bids fair, I think, to eclipse his hitherto celebrated and justly-prized Incubators.

I have used Mr. Christy's Incubators for five years, and I have had as many as three at work at one time (the pattern without the circulating boiler), and I have been very successful with them. I have, therefore, not one word to say against Mr. Christy's Incubators, and I am free to acknowledge that he is the "representative maker and introducer into England of hot water-worked machines," and that all persons who are interested in artificial incubation owe him a debt of gratitude for what he has done to advance this science; but here I

must stop short. Mr. Christy has done much ; but I hope he will excuse my saying that there can be no reason why someone else should not do more.

Mr. Christy says, in his letter to you, "I have not adopted. nor do I recommend, a continuous system of heating." I am fully aware that he has not adopted it ; but why it should not be recommended I am at a loss to conceive.*

I think that most of your readers who have worked Incubators will agree with me, that if you can get a perfect thermostatic apparatus, it must be less trouble to work than one to which you must either add a quantity of boiling water twice a day, or whose circulating boiler you must attend to for from thirty to sixty minutes, night and morning.

No perfect thermostatic apparatus has before this been invented, and I believe that all lamp Incubators have more or less failed because they have all more or less gone on the wrong road to gain success.

Mr. Hearson heads the advertisement of his Incubator with these words, **"The Problem Solved ;"** and if he means by that the problem of how to keep a regular temperature with absolutely no trouble, **I must acknowledge that I think he has fairly earned the title.**

I will now proceed to give you an account of my experience of his machine.

I was much struck, early in March last, by a drawing of Mr. Hearson's Incubator, similar to the one you published on April 8th, and I accordingly purchased one to try.

Having ordered my Incubator, I proceeded to lay by some eggs from some fowls which I had a desire to hatch artificially, but owing to my not receiving the Incubator (on acoount of some mistake about my order) for nearly three weeks, the eggs I at first filled it with were very stale, and your "incubating readers" will at once see that they were not fit for a favourable trial of the machine. However, I put the eggs in to the number of sixty-two (though the Incubator is rated for only fifty eggs), and having previously filled it with water as directed, I commenced my register-keeping. I enclose you a copy of my register, kept on one of the forms supplied with the machine, and give a short account of what took place.

The machine was kept going for thirty-one days, **and I never during that time touched the flame** (in my case a gas jet) **or replenished the water.** The temperature never varied more than 4½ degrees, as it ranged between 102° or 106½° ; and during the whole of the time **it was regulated by the thermostatic apparatus, and I found that the size of the flame, which varied a good deal, according to the pressure of gas, made no difference to the regularity of the temperature.**

Mr. Christy says that "very considerable variation is without the slightest importance," and he gives a wide range within which success is possible. I quite agree with him in thinking so ; but, at the same time, anyone who has had practical experience will, I think, acknowledge that a regular temperature is desirable, and one of Mr. Christy's chief boasts has always been of the regular temperature maintained by his machines."†

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*Since this was written, Mr. Christy has acknowledged the superiority of our system by following in our footsteps, and this, too, after having spent from ten to fifteen years in prejudicing the public mind against lamp and gas incubators. Those who have the sixth edition of "Hydro-Incubation in Theory or Practice," by Thos. Christy, published in 1880, should read page 9, and compare this with subsequent opinions by the same author.

†On page 20 of the work alluded to on preceeding page, Mr. Christy says: "The whole theory of artificial incubation is, as has been shown in the preceding chapters, to keep the upper part of the eggs at a regular temperature of say 100° to 106° Fahr. and to provide sufficient moisture and ventilation ;" but as soon as an apparatus appears in the market which will do this with certainty, Mr. Christy immediately contradicts himself, and says, in his letter to *The Field*, that "a very considerable variation is without the slightest importance."

The result of the hatch was as follows : 62 eggs put in. Eggs examined on eighth day : 20 unfertile taken out, and 21 fresh eggs put in. On tenth day 2 stinking addled eggs taken out, and on the fourteenth day 1 unfertile of those last put in was taken out. This left 62 eggs in, which were all presumed to be fertile. On the twenty-second and twenty-third days 25 strong chickens were taken out, and 15 eggs with full-grown or nearly full-grown dead chickens (so often the case with stale eggs) were thrown away. There were now, therefore, 22 left in, to hatch in about a week more, and on the twenty-ninth and thirtieth days 19 of these were hatched alive, 2 only were dead in shells, and 1 proved to be badly addled. The total outcome was, therefore, 44 from a possible 61. Your readers will observe, that whilst out of the stale eggs only 25 hatched from 40 fertile, **no less than 19 hatched out of 21 fertile eggs,** which were freshly laid. I may add that at this time all the forty-four chickens are doing well.

Now, Sir, I think you will agree with me that the result has been good, and I have little doubt that if all the eggs had been fresh, the hatch would have been as good as most people could wish for.

I have filled the Incubator again with sixty-two eggs, and now, having been started forty-eight hours, it has only varied one degree.

The great merit of the invention lies in the capsule, which expands the moment the desired temperature has been reached, and raising the damper, allows the flame of the lamp to pass up the chimney without further heating the water in the tank.

The whole machine, however, has been carefully thought out and arranged, and the methods of ventilation and damping the air, which I consider more important points even than regular temperature, leave little to be desired.

The air enters at a good-sized hole in the bottom of the box, and passes up through a shallow tray of water, which has an open ring in the middle for this purpose. Over this opening is laid a piece of bent, perforated zinc, having again laid over it a piece of very porous material, such as is used for shading fruit trees, and which lies in the water of the tray all round. This piece of stuff is always very moist, and the air being naturally attracted by the hot tank above the eggs, no doubt passes in considerable quantity through it, and upwards through the eggs, which also rest on perforated zinc and the same material, and then finds its way out through the holes which exist on each side above the egg drawer. **I think this is the most efficient method of damping the air which has yet been applied to any Incubator, and I look upon this as a point of the greatest importance.***

In conclusion, I should like to say, as Mr. Christy complained in his letter to you that " the undersigned article in your paper was calculated to do him serious injury, " I have no other object in writing this than to place before those who are interested in the subject **my practical experience of an Incubator which appears to me to fulfil every want ;** and I certainly should take no pleasure in injuring Mr. Christy, whose Incubators I have used many times with great success, but which, like most other things in the world in these days of competition and invention are liable to be improved upon.

I hope, Sir, you will state I, at any rate, was not the writer of the unsigned article which appeared in *The Field* on the 8th of April.

FRANK WILLAN.

Thornhill Park, Bitterne, May 6.

[We are glad to receive Mr. Willan's experience of the value of Hearson's Incubator, of which we had expressed a favourable opinion in the unsigned article referred to, which was certainly not written by Mr. Willan, nor by any-one but the editor of this department of *The Field*.—ED.]

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* We think it only fair to state that we were the originators of this system, which has now been adopted in a slightly modified form by Mr. Christy and others ; but as their Incubators are not ventilated in the same way as ours are, other expedients have to be resorted to as the hatching proceeds.

100 PER CENT. HATCHED.

Woolmer Forest Poultry Farm, Liphook, Hants.

22nd April, 1886.

Dear Sirs,—I am very pleased to tell you that I have just succeeded in hatching out 100 per cent. of the fertile eggs put in your Incubator. Every fertile egg hatched, and there was not one dead in the shell or deformed. I had the water tray taken out every week, scalded and well filled with water. The temperature I worked at last season was 102°, in this case I worked at 104° (as suggested by you), and the last week it went up to 105°. I have now about 20 hens sitting, and feel sure they will not produce such a good result as your Incubator. I am just filling it with pheasant,duck, and turkey eggs, and feel confident of success. You are welcome to use this if of any service to you.

Yours truly, H. WARREN.

P.S.—I shall have none but your Incubators after this.

Letter to "CASTNER'S MONTHLY AND RURAL AUSTRALIAN."

INCUBATOR RESULTS.

Dear Sirs,—We notice on page 276 of "Rural Australian" for October, a paragraph stating that you will be pleased to publish hatching results of any variety of Incubator. We enclose herewith letter and register showing the wonderful regularity of "Hearson's Genuine Champion Incubators," as sold by us. This is only one of many of the most satisfactory reports which we are continually receiving.

Yours truly, HOLDSWORTH & Co.

[COPY.] Blinkbonnie, Chatswood, Lane Cove Road,

September 24, 1887.

Messrs. Holdsworth & Co., George Street, Sydney.

Sirs,—I have much pleasure in testifying to the excellence of Hearson's Champion Incubator (for 100 eggs) purchased from you. I had never seen one before, but after carefully reading the instructions I started it with 101 eggs, and brought out 32 out of 38 fertile hen, and 54 out of 59 Muscovy duck eggs, being 85½ per cent. of chicks, and 91½ per cent. of ducks. I consider this extremely good, as some of the duck eggs were over three weeks old when I put them in. I also hatched two geese, the only fertile eggs I had in. They are all strong, healthy birds, and no trouble to rear. I certainly think "Hearson's" is the perfection of an Incubator, and shall strongly recommend it to all my friends. I enclose a copy of a month's register, and you can see how little the drawer thermometer varied the whole time. There is not the least trouble in attending to it; I fill and trim the lamp morning and evening. I find it is best to keep the lamp well turned down all day, as the room I work it in is very warm during the daytime. I may mention that the Muscovy ducks take 35 days to hatch, geese 30 days. I have the drawer now filled with geese, ducks', and hen eggs, and a few canaries'. 31 of the hens and ducks are due on Monday next, some of which are now chipping. I shall be most happy to show the machine in working order to any one at any time.

I am, yours truly, H. A. ROSE.

P.S.—I had a hen sitting at the same time, and I find her chicks at two days old are not so strong as those from the Incubator three hours after coming out.

Copy of Register.

Date.	Temperature of			No. of Eggs put in.	Number and Description of Eggs taken out.			Hatched
	Water.	Drawer.	Room.		Unfertile.	Addled.	Dead in Shell.	
April.	Deg.	Deg.	Deg.					
1 E.	132	102	58	17				
2 M.	129	103	60	41				
,, E.	127	102	58					
3 M.	129	104	59					
,, E.	127	103½	60	4				
4 M.	130	104	60					
,, E.	126	103	59					
5 M.	130	104	58					
,, E.	129	103½	58					
6 M.	130	103	56					
,, E.	129	104	58					
7 M.	130	104½	58					
,, E.	130	103½	60					
8 M.	129	104	58					
,, E.	126	103½	58					
9 M.	129	103½	58					
,, E. *a*	130	103½	58	21	20			
10 M.	129	103	56					
,, E.	125	103	57					
11 M.	129	103	57					
,, E. *b*	129	103½	58	2				
12 M.	128	103½	57					
,, E.	126	102	57					
13 M.	127	103	57					
,, E.	124	102½	58					
14 M.	128	102½	58					
,, E.	123	102	58					
15 M.	128	103	59					
,, E. *c*	125	103	59	—	1	2		
16 M.	127	102½	58					
,, E.	124	102	57					
17 M.	126	103	57					
,, E.	123	103	57					
18 M.	126	103½	57					
E.	124	104½	58					
19 M.	126	104½	57					
,, E.	123	104½	57					
20 M.	125	106	58					
,, E.	123	106	57					
21 M.	123	106	59					
,, E.	122	106½	59					
22 M.	122	106½	60					
,, E.	121	106	60					
23 M. *d*	122	106	58	—	—	—	—	5
,, E.	124	105	60	—	—	—	1	9
24 M.	124	104	59	—	—	—	11	7
,, E.	125	104	60	—	—	—	—	2
25 M.	126	104	58	—	—	—	3	2
,, E.	130	104	58					
26 M.	128	103	57					
,, E.	129	104	57					
27 M.	127	105	58					
,, E.	123	103	59					
28 M.	125	104	58					
,, E.	124	104	58					
29 M.	125	104	57					
,, E.	123	103	55					
30 M.	126	104½	56	—	—	—	—	8
,, E.	130	103½	57	—	—	—	—	8
May.								
1 M.	128	103	57	—	—	1	2	1
,, E.	127	104	57	—	—	—	—	1
2 M.	132	105	58	—	—	—	—	1
,, E.	128	104	59					
				85	21	3	17	44

a Examined Eggs, and replaced unfertile with fresh. *b* Took out two which stunk, and replaced with fresh. *c* Took out one unfertile, which was put in on the 9th. *d* All strong chickens.

FRANK WILLAN.

"THE FIELD," *June* 3, 1882.

EXPERIENCES WITH INCUBATORS.

Sir,—There must be many in a better position than I am to give information as regards Incubators; as few, however, make their experience public, perhaps my own, though short, may be of service.

I have had this season five of Christy's three of which have been in constant use. These have been supplied with hot water from a boiler put up for the purpose, and have had, I may say, devoted attention paid to them. Although the fault may lie with the worker, and not with the machines, yet I am obliged to confess that I cannot say that I have been successful. From many batches I got a bare 10 per cent., and I am sure that altogether 15 per cent. would be rather over than under the mark.

Latterly I have been working a machine of Hearson's and also one of Tomlinson's; from the former of which I got twenty-eight chicks from thirty-five eggs, all the eggs being, as in Christy's, pullet's eggs. From Tomlinson's I got about half, getting forty-one strong chicks, and attribute the smaller average to some of the eggs, which were put in later than the others, getting chilled when the chicks from the first eggs were being taken away.

I cannot speak too highly of the ease with which both machines are worked. I find both regulate quite easily, and require no attention; at least, I give them none, except every twelve hours. It is a great matter not having to change the position of eggs in the drawers; and in both these Incubators the temperature can be changed with great ease—in Hearson's by moving a small lead weight, and in Tomlinson's by turning a small screw, which regulates the degree at which the extra escape of gas begins.

Without wishing to injure Mr. Christy, **I can say that I could work six Incubators of the two makers I have spoken of more easily and quickly than I could one of his.** I consider a person who is able to hatch from one of Christy's "Henwife" Incubators transcendently my superior, and I both envy and admire his success. I have been much more successful with duck eggs in Christy's big Incubators, and I also believe that had I had hens' eggs all the season instead of pullets', things would have gone better.

I had difficulty at first both with Hearson's and Tomlinson's regulators, owing to this place being 650 feet above the sea level.* I had, in the former case, to get a new capsule, and in the latter to recover the tube, as both expanded too soon in the lighter air. J.M.

Carstairs, N.B., May 30.

P.S.—The relative percentage of chickens hatched in the above experiment is therefore—

Hearson's Champion	**80** per cent.
Tomlinson's Automatic	50 ,,
Christy's Hydro-Incubator	15 ,,

"THE FIELD," *April* 19, 1884.

OBSERVATIONS ON INCUBATOR WORK.

I have recently been making some observations on the working of Hearson's Incubator, which may be of some interest to persons desirous of using this or any

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* A difference in altitude of 650 feet above sea-level causes a variation of one degree only (below the normal) in the Champion Incubator. At the time this apparatus was supplied we had not had occasion to take into consideration changes of altitude; but this letter led to the invention of an apparatus for testing the capsules, quite apart from their use in Incubators. In March 1883, six capsules so tested were supplied with an Incubator ordered by Mr. C. H. Marshall, of Chumba State, India, and these on being tried in an Incubator at elevations varying from 3300 feet to 6700 feet, were found to adjust the egg drawer in the same manner and with the same certainty as those adjusted for Incubators to be worked at or near sea-level. Every capsule sent out bears a number which corresponds with a scale of temperatures kept at our works. This system enables us to send out Incubators adjusted to stop at any temperature for any altitude. Mr. Marshall's letter will be found at page 80.

similar contrivance. I will not enter into any detailed description of the machine, as that has already been given in *The Field* for April 8, 1882, or may be read in the pamphlet published by the makers. It may, however, be desirable to state that the essential parts of the contrivance are a cistern of water heated by a gas flame, or that of a paraffin lamp, with a drawer beneath to receive the eggs. Ventilation is ensured by a supply of air being allowed to ascend through a piece of very open canvas, which is kept moist by its margin being in a tray of water. This supply of air passes through the perforated zinc on which the eggs rest, so that the under sides of the eggs are exposed to fresh, cool, moist air, and the upper to the heat radiated from the hot-water cistern above.

So far the natural conditions of incubation are satisfactorily imitated, as they have been in Incubators of other manufacturers. The maintenance of a steady temperature, which must not, on any consideration, be allowed to rise, even for a short time, above a certain fixed point, is the next important consideration. This is very ingeniously accomplished in the Incubator under notice.

The chimney carrying away the heated air from the lamp is bent at right angles some few inches above the flame, and passes horizontally through the water in the cistern, to which it imparts its warmth, the heat of the water depending on the size of the flame; but in order to prevent a fatal rise of temperature, an ingenious contrivance is had recourse to. This consists of a small capsule placed immediately over the eggs; hermetically sealed within this capsule are a few drops of a volatile hydrocarbon liquid, which, by fractional distillation, can be obtained of the exact degree of volatility required, so as to boil at any desired temperature. When this is reached, the spirit is immediately volatilised, and the capsule, from being flattened, is distended into an ellipsoid form. On this capsule rests a perpendicular rod, in its turn supporting an horizontal lever, which carries at its end a disc closing the top of the chimney over the lamp, and so directing the current of hot air through the horizontal tube in the cistern. On the heat reaching the required point, the capsule expands, raising the lever and the disc which closes the top of the chimney, thus allowing the heated air to escape directly, in place of passing through the tube in the cistern. Consequently overheating is impossible whilst the apparatus is in action, and by adjusting a moveable weight on the lever the temperature may be regulated as required.

Within the last month I have been making some observations on the working of this machine. I find that once adjusted to any required temperature, no further attention is needed beyond replenishing the lamp. The heat of the atmosphere may vary ten or fifteen degrees, or the flame of the lamp rise or fall without affecting the heat of the hatching drawer, provided that the lamp is set so that it has a tendency to be somewhat higher than the desired point, when the expanding capsule at once comes into action, and by raising the disc lets the superfluous heat pass away without going through the cistern. The regulating action is quite automatic, and it is interesting to watch the disc rise and fall with the varying heat of the egg drawer, as cold air is let in or excluded.

I found no difficulty whatever in keeping the temperature within half a degree of the desired point. For some days I aimed at maintaining 104° on the upper surface of the eggs. Even when the atmosphere was warmest the heat never exceeded 104½°, nor fell below 103½° except when the drawer was opened, when it lowered instantaneously, the result being to bring the disc down on the chimney and direct the hot air from the flame through the cistern. The advantage of being able to maintain for any length of time an exact and unvarying temperature is one of very great importance, and I am sure that the practical facilities for so doing which are offered by this contrivance will tend greatly to extend the use of Incubators.

My observations have been rather of an experimental nature, and, therefore my practical results have no special value; but I am inclined to think the temperature at which I have been working—that of 104° on the upper surface of the eggs—somewhat high, and should be inclined to try a degree lower.* One of the results which may perhaps be attributed to the steady heat maintained,

was that I had one chicken out of the eggs incubated perfectly free from the shell on the morning of the nineteenth day. In some experiments that I performed many years ago I found that the period of incubation in ducks' eggs was greatly increased by a low temperature and repeated exposure to long continued cold ; I have no doubt that, to some extent, the converse holds true. There would be no difficulty in working out an extended series of observations in a machine so easily controlled as that with which I have been experimenting.

W. B. TEGETMEIER.

[*After experiments on temperature carried on without intermission for two years, we find that in cold weather the egg drawer may be kept a degree or two above 104°, and in hot weather a degree or two below 104°. When the air in the room in which the Incubator is placed stands at 60°, the best temperature for the drawer is 104°.] (89).

"THE AGRICULTURAL ECONOMIST," *June* 1, 1882.

INCUBATORS.

Incubators are coming more and more into use. It is cheaper and safer to use them than to waste the time of the hen for purposes of hatching ; besides the risk of eggs being spoiled through the hen giving up sitting before having done her time. It has even been found profitable to use Incubators, **which are now quite thrown into the shade by the Hearson's Patent,** in which the regulation of temperature is more effectually accomplished than by any other contrivance we have been called upon to view. In this machine there is a regulator which precludes the possibility of an injurious rise of temperature, and when once set in action it goes on with very little attention. The improvement over other Incubators is a flat capsule, about two inches square, formed of two thin sheets of metal, soldered at the edges, and containing a liquid which expands on reaching a temperature of 106° Fahrenheit. This is firmly supported under the centre of the water tank above the eggs. A tube passing through the tank allows a stout loose wire to pass down and rest on the capsule. Should the heat over the eggs exceed a given degree, the capsule expands, raising the wire which lifts an arm that carries at its extremity a damper. When this is raised the hot air from the lamp passes up the chimney into the open air. On the temperature falling the capsule contracts, the arm carrying the damper descends. and the heated air, passing through a horizontal tube which traverses the tank, raises the temperature to the degree required. The regulating arrangements of this machine appear very perfect, and we should say **that this is the best Incubator now in the market,** as it combines all the latest improvements of other machines, with advantages not to be found in those of other makers. The inventor claims the improvements, for which the Letters Patent have been granted, ensure success in the hands of persons who know nothing of the sciences involved, but who desire to hatch either for profit or pleasure, and this we can well believe, because the regulating system is so well arranged that **the machine is really automatic.** *It may be worked with either coal or air gas, or a paraffin oil lamp.* The Incubators are well made of pine wood, dovetailed, and all mountings are of lacquered brass. They are complete in themselves, and require only oil or gas for the lamp and a few gallons of hot water to commence operations.

Letter to the Editor of "THE LIVE STOCK JOURNAL," *November* 23, 1883.

GEESE LAYING.

Sir,—Some time since I parted with some of my Toulouse geese to my friend Mr. James Garrard, of Pinner. At the usual time they laid a number of eggs, then they moulted, when about two and a half months ago they again commenced laying, and have continued to do so up to the present. Is not this very unusual ? In all my experience I never heard of a similar case. Mr. James Garrard, thinking he would like to test the fertility of the eggs, bought a Hearson's Incubator, and about a fortnight back hatched out four goslings. He gave me twelve eggs,

which I put into my Hearson's Incubator. I have ten goslings hatched, and there is another coming. One egg was removed, being unfertile.

Mr. James Garrard's goslings are healthy and well; nine are strong-looking. Now comes the question—shall we rear them? I think so; at all events we mean to try.

To-day I noticed one of my Toulouse carrying straw, &c., for a nest, which portends that she, too, is likely to lay. I never heard of geese laying in November, and, therefore, should like to know if any one else has the same thing happening.

I am giving up keeping the Toulouse in favour of the Embden, as I find the latter more profitable in every way but the laying of eggs.

H. WEIR.

Extract from "LADIES' GAZETTE OF FASHION," *Oct.*, 1882.

I was in Regent Street the other day, when my attention was attracted by a crowd gathered round No. 235, and I perceived that the object of so much interest was a number of lively young chicks running about in the forepart of the window, where a miniature yard was arranged. Inside the shop I was introduced to "Hearson's Champion Incubator," a marvellous invention for hatching poultry, game, or ostriches. A cleverly-written little pamphlet gives full directions for working it successfully. It was interesting to see the chicks in various stages of their existence, from the time when the tiny beak has just tapped the shell to when the little stranger has cleared the shell and begins to steeplechase over the broken shells and its partially emancipated companions; to show this the Company have arranged an Incubator having glass sides. After this stage the sturdy chicks are taken by their careful nurse and placed in the "Foster Mother," where they are left for a time. Space will not permit us to describe the whole system; **suffice it to say that the greater part of the chicks thus artificially hatched are fine, strong, healthy birds,** and, I was told, found a ready sale. Those of our readers who live in the country cannot do better than send for this pamphlet, which only costs 15d. **An incredible amount of trouble will be saved in the poultry yard by using this Incubator,** which, with little attention, insures a supply of poultry all the year round.

Extract from "FARM AND HOME," *September*, 1882.

ARTIFICIAL HATCHING.—Artificial hatching, however, has made rapid progress since Tomlinson came out with his lamp machine, regulated by an air thermometer. Later still, the Champion Incubator, by Hearson, was bought out. **This latter, in our idea, is the most likely to come to the front as soon as it is better known.** Let T. Yeo write to C. E. Hearson, 235, Regent Street, London, W., for the pamphlet, enclosing 15d. in stamps. We have tried the machine, and it gave us the most satisfaction of all those we have had, and they were many.—POULTRY FARMER, *Ringwood.*

Extract from "THE BAZAAR," *December*, 1882.

During the past five or six years, great strides have been made in the improvements of Incubators, or egg-hatching machines. We have seen a variety of self-regulating hatchers, elaborately contrived, and impossible in practice, as the sequel has shown; but not until the hydro-machines appeared upon the scene did the public manifest any great desire to take the subject up; and then, sound in some respects, as the way of hatching by the means of hot water was found to be, it was shown by practice that in this go-ahead age people wanted something which should combine with a certain result a minimum of labour and expenditure of time. Mr. Hearson, a well-known expert in a particular branch of science, being challenged to produce such a machine, gave the idea his attention, and the Incubator bearing his name was brought forth. We first inspected it at South Kensington, where Mr. Tegetmeier was using it as an example in illustrating his lectures, and **the simplicity of its regulator at once arrested our**

attention. This is termed a thermostatic capsule, and may be explained as follows: It is well known that certain liquids boil at certain temperatures, and that when this happens, if the vessel Inclosing them is shut up. it must either distend or burst, unless it be very strong.

Water boils at.....	212	degs. Fahr.
Mercury	662	,, ,,
Alcohol	173	,, ,,
Ether	94	,, ,,

and various other liquids at other temperatures; so that, by a combination of liquids, Mr. Hearson has obtained a spirit which boils at a particular temperature. This he encloses in a hermetically fastened capsule of sheet brass, and when placed in the egg drawer it boils at the given point, expands the flexible capsule, and lifts the wire connected with the heating apparatus.

[*Here follows a description of the general construction of the "Champion Incubator," which, as it has already been explained in the foregoing part of this Pamphlet, need not be given again.*]

In practice **the damper, which is beautifully arranged,** will be found to be a guide to the expenditure of gas or oil, for if it remains constantly at a particular point, and open, the lamp may be turned down. There is another aid to the worker: the lever is furnished with a weight, which, moved gently on, increases the heat in the drawer, whereas, without it, the machine will not register more than 98 degs., so that **in every way the greatest care is taken to prevent overheating.** The egg drawer in the machine is curved, and the eggs do not thus require moving. Under the drawer is a zinc tray supplied with water; an air current is furnished at the bottom and sides, passing through a damp canvas. Gas is the simplest form of heat, but a lamp burning thirty to thirty-six hours may be used with equal effect. Mr. Hearson gives a case of a remarkable trial, in which, while the room varied in temperature during the twenty-one days from 45 degs. to 65 degs., the water in the tank from 125 degs. to 133 degs., and the barometer 29·3 to 30·4, the thermometer only varied 2 degs. —that we can easily understand from the nature of the regulator.

We have never been among the enthusiastic in the matter of artificial hatching, because we have found a difficulty in believing that Incubators have thus far been applicable to business ventures. We know they are a success, so far as their ability is concerned, and it only remains for men like Mr. Hearson to perfect them so completely that they should be regarded as valuable additions to the farm and to every poultry yard, instead of pet instruments for the gratification and pleasure of the wealthy.

Extract from "THE CITY," *November* 14, 1882.

HEARSON'S CHAMPION INCUBATOR.

With improved appliances, artificial incubation bids fair to become not only a popular, but a profitable pastime, and poultry and game breeders will, we have no doubt, hail with satisfaction the advent of an apparatus wdich claims to do away with all the inconvenience consequent on the use of hot-water Incubators.

For the purpose of hatching artificially, it is essential to maintain a temperature of 103° Fahr., without variation either way of more than three degrees for the full period of incubation; but the difficulty of doing this in any of the so-called Incubators hitherto in use will scarcely be credited by those who have not had practical experience with them.

Many attempts, based on the expansion of air. mercury, and dissimilar metals, have been made to render heat in rooms, greenhouses, incubators, ovens, &c., uniform: but **none of these appliauces can compare for simplicity and certainty of action, with the thermostatic capsule** invented by the patentee of the "Champion Incubator."

Among the bodies previously used for regulating temperatures, air was the most expansible ; but, at the best, the augumentation in volume of this body, for a rise of one degree Fahr., amounts only to 1-460 of its volume, whereas the liquid used in the regulator invented by Mr. Hearson expands to about 300 times its volume for a rise of one degree ; or, in other words, **it is 138,000 times more sensitive than any previous regulator,** the simple fact being that, at the critical or boiling point, the liquid suddenly changes into vapour, and on the temperature being lowered, the vapour immediately returns to the liquid form, **a change in temperature of half a degree being sufficient to determine the vaporisation or condensation of the liquid.**

The manner in which the expansion of this capsule is made to act upon a paraffin lamp or gas flame, so as to maintain a regular temperature, although extremely simple, could not be well explained without the use of woodcuts and a longer article than our columns will allow ; but persons interested in this apparatus, and the regulation of temperature generally, cannot do better than apply to the maker's address, which will be found in our advertising columns.

We may note, in conclusion, that in passing through Regent Street a few days ago we saw turkeys, pheasants, and chickens running about in the windows ; and through the glass sides of an Incubator in the hatching-rooms we saw many chickens cutting their way through, and coming out of their shells.

To the Editor of the "MORNING POST," *Feb.* 15, 1883.

Sir,—One of your correspondents asks for the experience of those who use an Incubator. I am now using one of Hearson's, which will hold about 100 eggs, and which seems to me to hatch with the minimum of trouble and the maximum of success. I have 40 chickens, from seven to 21 days old, having only lost two weakly ones. Of 27 eggs that should come off to-day five chicks are come out, 17 have pipped, and of the remaining five two are certainly alive and will be out to-morrow morning. The percentage of those that die without breaking the shell is very small, only two having failed out of 21 eggs during the last fortnight. Of course all unfertile eggs, unless overlooked, are withdrawn about the fourth day, and are then quite fresh for cooking purposes.

Letter to Editor of "POULTRY," *April* 6, 1883.

Sir,—I have read with much interest your article, on page 51 of *Poultry*, with regard to thermometers, and more particularly as to the use of them in Incubators. As these latter are now being so largely used, I think it would be of great benefit to the poultry community if from time to time we got a few notes from those who have been successful in their hatchings, and what make and temperature was employed ; for **I look on the Incubator as a wonderful saving to the poultry-breeder,** as he need now only keep the very best birds, without being troubled by a number of mongrel sitting hens. As regards great hatches, I had a Rouen duck that sat on twenty eggs, and hatched out nineteen, all of which grew up. This I take to be a wonderful instance, but it has been equalled artificially by a neighbour of mine, who with **one of Hearson's Incubators hatched ninety-five chickens out of one hundred eggs.** Has any one come up to this standard, I should like to know ? I use a Hearson's Incubator, and will give notes when needful.

HARRISON WEIR.
Benchley, Kent.

[ED.—In this successful experiment the maximum temperature of the egg drawer was 102° Fahr.]

"POULTRY," *February* 15, 1884.

EARLY LAYING.

Sir,—Having read some time back in your useful paper of pullets laying at six months, I forward you the following particulars respecting a bird I hatched last

autumn by one of Hearson's Champion Incubators. I started at the end of last July a second size Incubator to hold 100 eggs, and have hatched and reared over 150 chickens, notwithstanding having started the wrong time of the year, and the miserable damp weather we have lately had. My first hatch was twenty-two chickens from thirty-seven eggs (fifteen of which were unfertile, the Incubator hatching every fertile egg) on the 18th August last. In this lot I have five bright young cockerels, the remainder being pullets of a good hardy laying strain. Much to my astonishment and to the amazement of the majority of my friends, who, although seeing that the Incubator could hatch strong chickens, still hardly believed in it, and continually told me that I should not be able to rear the chickens in the winter, and, should I succeed in doing so, that they would never be any good for laying. On Saturday, the 12th January, six days before she was five months old, a white Brahma-Cochin pullet laid her first egg, again laying on the 14th an egg of very decent size. As I think this may interest many amateurs like myself, I write you on the subject, trusting that you will kindly insert my letter, and apologising for trespassing on your valuable space. I should be glad to show the pullet and others to anyone desiring to see them.—MANAGER, *Kennington Bijou Poultry Show.*

"POULTRY," *February* 29, 1884.

CHICKENS IN REGENT STREET.

Chickens in Regent Street, fashionable, gorgeous Regent Street, full of carriages, grand people, swells male and female, footmen with faultless calves, and coachmen with fur capes! Surely I must mean children—chicks of that sort, and so make a very poor joke. Plenty of them, poor little dears, no doubt, and many seem stuck up and precocious; others are not the least so, and I am sure would be glad to be gathering cup moss and primroses this mild February, but are doomed to be in London in the very height of the season.

But I do not speak of children, but chickens—live chickens hatched of eggs. A few days since I was walking in the afore-named Regent Street, and noticed a crowd round a window. I edged my way through that crowd, with all a country dweller's curiosity.

Inside the window were live chickens, six weeks old or so, picking grain off the window sill, and looking happy enough; but inside the larger glass house was a smaller one, one of perhaps 1½ foot square. In the centre of this little glass compartment were a brood of recently hatched chickens pushing their little yellow-down bodies against a metal chimney in the middle, in which I could see was a gas burner. These were incubator-hatched chicks, and the room was their coop, kept warm by the gas, and the chimney represented the old hen's body. It was amusing to see how the little fellows knew all about it, how they pushed and struggled for places near the warm pipe, as schoolboys would—at least they used to do it in my time—for the best places near the fire in the school-room on cold winters' nights.

Had generations of chickens had a hot pipe for a mother they could not have been more at home. Soft chick-cheeks were laid against that warm pipe. One stout fellow maintained his place against all comers; others were constantly edging in and edged out. Heads were pecked at, intruding shoulders vigorously pushed forward, and a crowd, a regular close-packed London crowd on a small scale, were round that warm 3in. pipe. All seemed happy enough, save one who stood in a corner evidently tired of life, thinking it quite a mistake, a failure, a nuisance; Gaping in the corner stood this misanthrope on Tuesday. This is Thursday, and I have no doubt he is gone over to the majority before now. How that pipe was kept warm without burning the poor birds I cannot tell. I saw a thermometer within, so caution was used. I wonder whether any further plan, any covering for the birds to cuddle under, was used at night.

The sight was evidently one that bystanders and passers-by were pleased with. What of the future of these chickens? Would they be in suburban gardens? Would any of them reach a farm-yard? Would they be filled with wonder at the

change? Would these London, aye, Regent Street chickens, give themselves airs? Would they be spoiled by publicity and attention? Would they scorn old hens? Would they wonder where all the people had gone to? or happily, as now, would they adopt themselves to circumstances as they arose?

I think they gave pleasure to many, and to some country-born dwellers in the great city bring back recollections of home; while, did the little street Arab see them, he would learn for the first time what a newly-hatched chicken really was. So they did a good service, and may their lot be a happy one, the lot of these Regent Street chickens.—WILTSHIRE RECTOR.

POULTRY.

An excellent description of our apparatus appeared in *Poultry* in Vol. I., March 9, 1883, and a further description in Vol. II., March 21, 1884: the editor, however, wisely refrains from making any comments as to its merits until such time as he has tested its capabilities.

In an article on artificial Incubation the *Yorkshire Weekly Post* of March 24, 1883, says:

"One of the best machines of this class is that known as 'Hearson's.' We have heard the very highest testimonies as to its capabilities, and we were recently at the place of a gentleman who has about a dozen Incubators of various kinds, but this he prefers to any of them."

"THE NATALIAN," *South Africa*, *March* 22. 1884.

ARTIFICIAL HATCHING AND MANAGEMENT OF CHICKENS.

Some time ago I promised you a little information on artificial incubation and management of chickens. I now do so with great pleasure, after having had one of Hearson's Patent Incubators for over two months, and I must say it is simply perfection. Like most other people I was dubious as to the risk of getting one out, having heard about so many machines (if they may be so called), but being so bothered with hens leaving their eggs, and the breakage of eggs, &c., I resolved to try one. Now, I assure you, I am delighted at the result, and there is no doubt but that in a short time they will be found in every farmer's house in the Colony, especially as bacon and fowls are almost the staple food our farmers have to depend upon. So much for the introduction. Now for my text, and as I am not fond of long sermons I will come to—Firstly: On the 19th of last month (February) I put thirty eggs into the Incubator; on the seventh evening after, I examined these eggs and found eight clear or unfertile; these I put aside and put in as many fresh ones to replace them. On the morning of the 9th instant (twenty days) I opened the egg drawer and found ten or fifteen pipped; at 10 p.m. the same night I think had fifteen chicks, and early the following morning the whole twenty-two were out, strong and healthy. I never saw any more so hatched by a hen, and certainly no danger of their being trampled upon, as is often the case, which every fowl-rearer knows to his cost. I have now twenty-four guinea-fowls' eggs in, and there are twenty-four fertile out of thirty eggs.

I find that although in this climate the temperature changes from perhaps 86° in the morning to 60° in the evening, the Incubator rarely alters more than one degree. At first I kept a register sheet, but, on account of its invariable accurateness, I have put the register sheet aside as useless. I merely look at the thermometer in the egg drawer morning and evening, and find it generally at 103°, which, in my opinion, is the proper heat.

The great success attending this Incubator is the splendid arrangement for the surplus heat escaping by means of the escape valve, which opens at 98° or 100° Fahr., and also arrangements for keeping the eggs at a moist heat, as it is well known that when hens lay away and hatch they generally bring out 10 per cent. more chicks than if cooped in a dry atmosphere.

"THE COUNTRY GENTLEMAN," *February* 17, 1883.

Of the various systems that have, from time to time, been introduced for hatching game or poultry, **none have reached the same degree of perfection as Hearson's "Champion" Incubator.**

This invention has apparently solved the problem of maintaining a regular temperature, with the least possible trouble to those who have charge of it.

This was amply proved by a gentleman well known to many of our readers as the owner of a choice herd of Jerseys, in the west country, who declared that during thirty-one days, without touching the flame (a gas jet) or replenishing the water, the temperature never varied more than 4½°, this admirable mean being mainly attributable to the capsule, which expands as soon as the required heat has been obtained, and prevents the flame of the jet or lamp raising to a higher temperature the water in the tank.

The various testimonials from reliable people who have tried Mr. Hearson's machine speak volumes in its favour, and there is no doubt it is destined to eclipse all other Incubators in public favour.

"THE STOCKEEPER," *March* 21, 1884.

HEARSON'S CHAMPION INCUBATORS.

There has been so much written and talked of in connection with Incubators, that there is not much that is new to be said of them, but Messrs. C. Hearson and Co. have, we think, justly earned the title of "Champion" for their Incubators, for the spirited head of the firm makes a study of everything in connection with them, and any little trifle that he thinks an improvement is carefully tested, and if proved satisfactory is immediately added; and from the numerous voluntary testimonials he is constantly receiving from well-known breeders and exhibitors, their can be no doubt that his machines are what he makes them out to be. Our old friend and contributor, Mr. Harrison Weir, amongst many others, speaks in high terms of them, and there is no doubt that as they hatch so wonderfully well, and are so very little trouble to look after (the looking after always being the great trouble with Incubators) they are fast coming greatly into favour with all large breeders, as in yards where large numbers of chickens are hatched, the time taken up in looking after as well as feeding a large number of setting hens is very considerable, and a really reliable Incubator very soon pays itself.

We noticed many little improvements the other day when we looked in at No. 235, Regent Street, and were surprised to hear that the smallest improvements are immediately patented by Mr. Hearson, as otherwise, we were told, they would be closely copied by other makers.

We would advise all who are interested in the great question of poultry-breeding to send to Messrs. Hearson for one of their explanatory pamphlets, which is well worthy of perusal, as all particulars, together with the mode of working, are fully and plainly set forth. We are sure anyone interested in artificial incubation would find it worth their while to pay a visit to Regent Street to see for themselves.

Extract from "LA REVUE DES ELEVEURS," *February* 15, 1894.

UNE NOUVELLE MÉTHODE POUR RÉGLER LA CHALEUR APPLIQEE A L'ECLOSION ARTIFICIELLE DES ŒUFS.

Il faut bien reconnâitre que les couveuses artificielles imaginées jusqu'ici étaient loin de résoudre le probléme posé depuis si longtemps de l'éclosion artificielle facile et sûre.

Ce que M. Hearson, l'inventeur du nouveau système a d'abord cherché, au prix de longs et patients travaux, paraît-il, c'est de régulariser, disons mieux de commander, le dégré de chaleur dont on désire faire usage pour l'éclosion des œufs. Chauffer sans surchauffer, c'est là, on le sait, la difficulté principale.

Le savant anglais à imaginé d'emprisonner entre deux tôles de cuivre mince une petite quantité d'un liquide qui bout, un peu audessous de la température propice à l'éclosion. L'ébullition du liquide communique aux parois de cette capsule une expansion, mise à profit pour ouvrir le registre d'une cheminée dans l'axe de laquelle, à l'extérieur de l'appareil, brûle ou une lampe ou un bec de gaz.

La chaleur émise par cette lamp ou ce bec de gaz, passe par le double tour d'un thermosiphon à travers un réservoir d'eau, lequel émet ainsi suffisamment de calorique pour chauffer rapidement le tiroir où se trouvent les œufs.

Mais dans ce tiroir se trove aussi la petite capsule, et par son jeu le calorique passe tout ou partie à travers l'eau ou dans l'air, de manière à garder aux œufs la chaleur stable dont ils ont besoin.

Cette manière aussi ingénieuse que simple de régler automatiquement la chaleur, se trouve complétée par une réglementation appliquée à la capsule elle-même.

Au moyen d'un petit poids glissant le long d'un bras de levier, l'opérateur a la faculté de faire subir une pression plus ou moins forte à la capsule et ainsi la température que celle-ci doit maintenir dans le tiroir, peut être augmentée si on le désire et tenue à une justesse beaucoup plus grande même que celle requise pour l'éclosion des œufs.

Le systèm de réglementation que nous venons de décrire succinctement ne laisse, nous paraît-il, rien à désirer, et, ce qui est très important, il évite et main-d'œuvre et surveillance.

En possession d'un tiroir aux œufs dont la température ne donnait plus le moindre souci, le savant anglais ne peuvait manquer de perfectionner toutes les autres parties de sa couveuse.

La ventilation, si essentielle au succès des éclosions, est largement assurée. L'humidité de l'air, autre point très important, est obtenue d'une façon suffisante et uniforme, grâce à une application trés ingénieuse.

En résumé, l'art de l'éclosion artificielle des œufs vient de faire, nous paraît-il, un progrès décisif. On est presque tenté de croire que la couveuse de M. Hearson doit produire une espéce de révolution dans l'élevage, quand on prend connaissance des nombreux témoins reçus par l'inventeur et que l'on constate que ces témoins accusent une satisfaction complète et enthousiaste, quant à la facilité de fonctionnement de l'appareil et aux résultats obtenus en fait d'éclosions, résultats qui sont, d'ailleurs, remarquables.

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CHAS. HEARSON & CO., LIMITED,

HOPE WORKS,

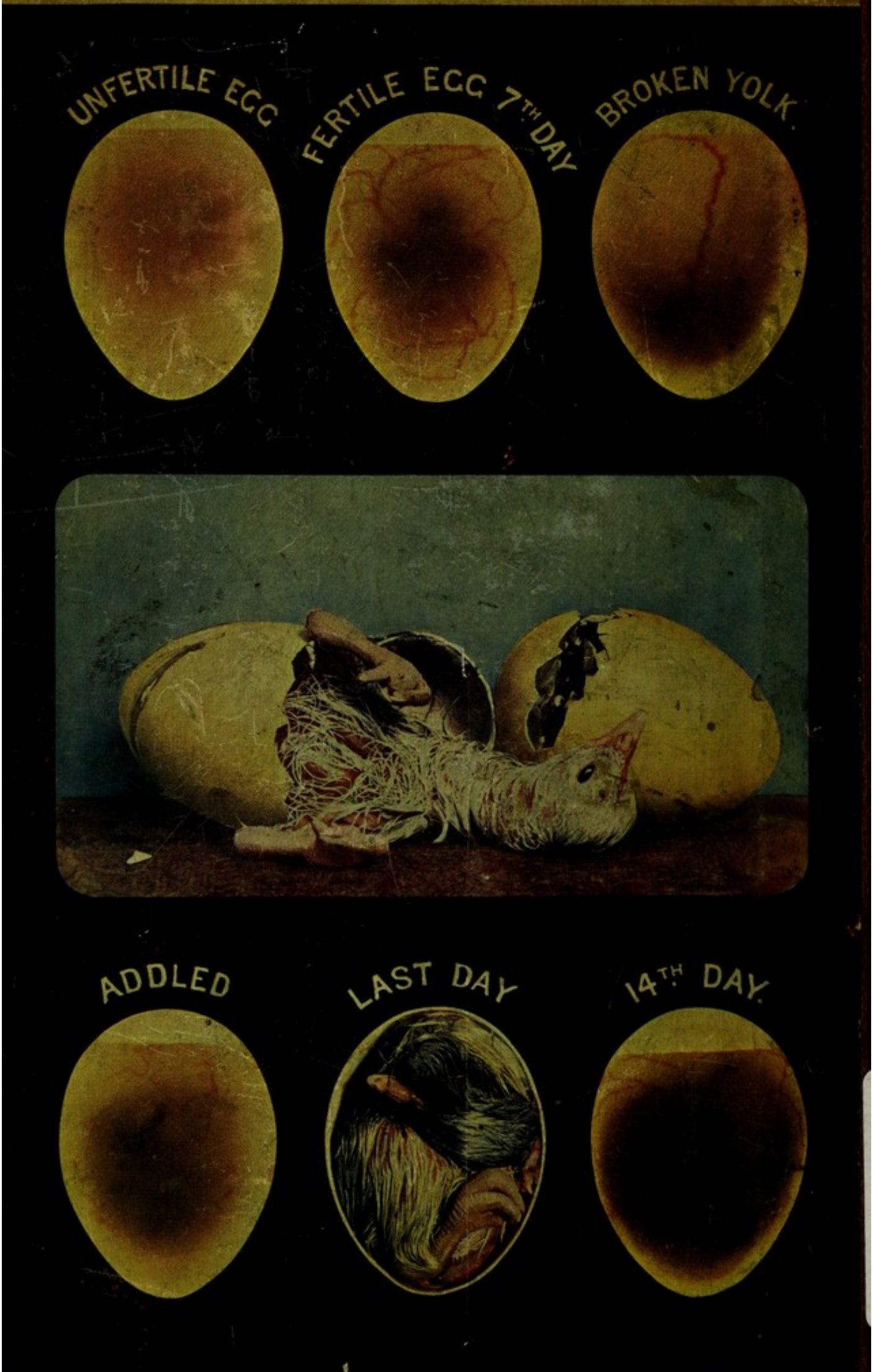
68, WILLOW WALK, BERMONDSEY,

LONDON, S.E.

GOODS REQUIRING ALTERATION OR REPAIR must be sent to our Works, CARRIAGE PAID, the sender's name being in every case enclosed.

To secure prompt attention a letter giving full particulars of what is wanted to be done must also be sent by post to the same Address.

EMPTY PACKING CASES, if returnable, are so marked inside the lid, and the amount we allow for them will be credited at once and remitted at the earliest opportunity.


UNFERTILE EGG
FERTILE EGG 7TH DAY
BROKEN YOLK.
ADDLED
LAST DAY
14TH DAY.