

Specification of Jasper Wheeler Rogers : preparing peat for fuel, and using the same in combination with other substances as manure.

Contributors

Rogers, Jasper W.

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A.D. 1848 N° 12,169.

S P E C I F I C A T I O N

OF

JASPER WHEELER ROGERS.

**PREPARING PEAT FOR FUEL, AND USING
THE SAME IN COMBINATION WITH
OTHER SUBSTANCES AS MANURE.**

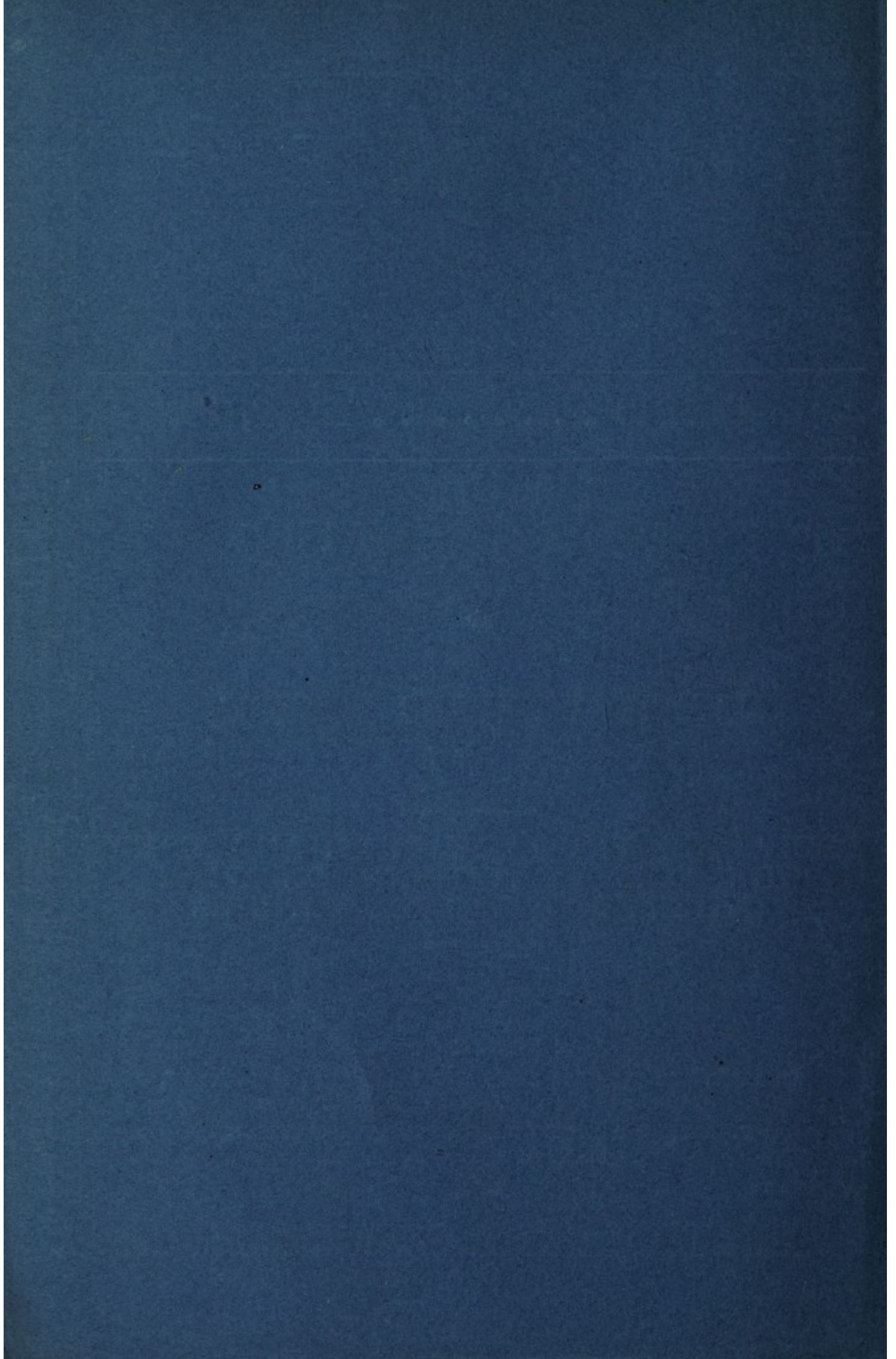
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A.D. 1848 N° 12,169.

Preparing Peat for Fuel, and Using the same in Combination with other Substances as Manure.

ROGERS' SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JASPER WHEELER ROGERS, of Nottingham Street, in the City of Dublin, Civil Engineer, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her
5 Royal Letters Patent under the Great Seal of Great Britain, bearing date at Westminster, the First day of June, in the eleventh year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Jasper Wheeler Rogers, Her especial licence, full power, sole privilege and authority, that I, the said Jasper Wheeler Rogers, my executors, administrators, and
10 assigns, and such others as I, the said Jasper Wheeler Rogers, my executors, administrators, or assigns, should at any time agree with, and no others, from time to time and at all times during the term of years therein mentioned, should and lawfully might make, use, exercise, and vend, within England, Wales, the Town of Berwick-upon-Tweed, and in all Her Majesty's
15 Colonies and Plantations abroad, and in the Islands of Jersey, Guernsey, Alderney, Sark, and Man, my Invention of "CERTAIN IMPROVED METHODS AND MACHINERY FOR THE PREPARATION OF PEAT AS A FUEL, AND IN COMBINATION WITH CERTAIN SUBSTANCES AS A COMPOST OR MANURE;" in which said Letters Patent is contained a proviso obliging me, the said Jasper Wheeler Rogers, by an
20 instrument in writing under my hand and seal, particularly to describe and ascertain the nature of the said Invention, and in what manner the same is to be performed, and to cause the same to be inrolled in Her Majesty's High Court of Chancery within six calendar months next and immediately after the

Rogers' Improved Methods for the Preparation of Peat, &c.

date of the said in part recited Letters Patent, as in and by the same, reference being thereunto had, will more fully and at large appear.

NOW KNOW YE, that, in compliance with the said proviso, I, the said George Wheeler Rogers, do hereby declare that the nature of my said Invention, and the manner in which the same is to be performed, is particularly described and 5 ascertained in and by the following description thereof, reference being had to the Drawings hereunto annexed, and to the letters and figures marked thereon (that is to say):—

This Invention refers, firstly, to a series of operations constituting a new system of preparing peat as a fuel suitable for furnaces and fireplaces, which 10 fuel, in a charred state, is particularly applicable to the manufacture of metals, for forge fires, for founders' use in moulding, and for pyrotechnical and other purposes; secondly, this Invention refers to the manufacture from peat of granulated charcoal, and to the admixture thereof with animal excrement, for the purpose of deodorizing the same, and making a diluted inodorous manure. 15

In the accompanying Drawings the apparatus which I employ in carrying out the various operations constituting the new system of preparing peat is clearly shewn. Before commencing to cut peat in large quantities from a bog or peat moss it is first necessary to drain the bog, so that the operation of cutting may be more safely and advantageously carried out; and this I am 20 generally enabled to do at the time of cutting the peat for manufacturing purposes, without a separate outlay for draining, by proceeding in the following manner:—After having ascertained the level of the bog, so as to find the natural outfall for the water, I begin the cutting by taking out blocks of peat averaging from four to six inches long by three to four inches square, to be converted into 25 fuel. I make those cuttings so as to form a number of trenches of any given length, and as nearly parallel to each other as the position and circumstances of the land will allow, commencing as near as possible to the natural outfall. These trenches I vary from one hundred to one thousand feet or more apart, according to the nature and depth of the bog; and in the first instance I form 30 them about four feet wide and four feet deep, a sufficient fall or slant being given to each drain to draw off from the bog the water which may run into the trenches. By referring to Sheet I. of the accompanying Drawings the arrangement of the cuttings, which are shewn in plan view and sectional elevation, and also the system pursued in deepening the trenches as the upper part of the bog 35 is removed, will be clearly understood. These trenches having been multiplied, and cut to a length sufficient to drain that portion of the bog, which is to be first cleared, I then remove the upper crust or surface of the peat moss transversely for about one fourth of the space between the trenches to the depth at

Rogers' Improved Methods for the Preparation of Peat, &c.

first of about two feet, and this I continue to remove alternately the peat from the trenches longitudinally, and from the intermediate part of the bog *transversly*, cutting each about two feet deep, by which means I prevent the bog from falling in by lateral pressure, and effect the drainage of the whole by the

5 terraces or steps which are thus formed by degrees in the bog, and which provide for the drainage of the water from the general mass. After this process has been carried into effect over the whole surface of the peat, moss, or bog to be reclaimed, then the surface or crust which has been left uncut between the trenches is cut away over the whole extent of the bog under reclamation, com-

10 mencing at the points nearest to the natural outfall. When the surface or crust has been removed, the second step or terrace is removed in the same way, then the third and fourth, until the entire is taken away, and the substratum can be then made fit for cultivation. Having explained the mode which I prefer in cutting the peat from the bog, I will now proceed to describe the

15 means employed for drying and preparing the peat.

In Sheet II. of the Drawings, Figures 1 and 2 represent a portable shed, to be made of wood or wickerwork as most convenient, open at the ends and sides, but having a waterproof covering at top of any convenient flexible material, and which hangs over the side. This shed is intended to receive the blocks of

20 peat soon after they are cut from the bog, in order that they may be partially dried by the action of the wind. The blocks are placed, immediately upon being cut from the bog, on trays *a, a*, which may be made of wood or wire or wickerwork, as most convenient, similar to that shewn at Figure 3, and the trays are piled one above the other in the portable shed *b, b*, to the sides of

25 which handles *c, c*, are attached, for carrying the shed from one place to another, or its bottom framing may be furnished with wheels if thought necessary. The sheds are placed in exposed positions, so that the air may circulate around and through them, and thereby drive off the moisture from the peat. When the peat has been thus exposed for a few days, according

30 to the season and state of the weather, the shed, with its load, is removed to the drying station, where it is unpacked, and the peat is piled up in clamps to receive an artificial drying in the manner following, now to be explained.

In Sheet III. one of the kilns or frames in which the peat is piled up to receive the artificial drying is shewn in several views. Fig. 1 is a longitudinal

35 elevation, partly in section, the better to shew the interior arrangement; Fig. 2 is an end view; Fig. 3 is a vertical section taken in the line 1, 2, of Fig. 1; and Fig. 4 is a plan view with a portion of the outer casing removed. This kiln or drying shed is erected over an excavation made in the ground, and forming a continuous ashpit from one end to the other of the shed. The sides of the pit

Rogers' Improved Methods for the Preparation of Peat, &c.

are secured by brickwork or masonry, and on either side a rail is laid to form a way for the ready passage over the pit of a series of furnaces or chambers A, A, A, intended to receive the peat which is to be charred, and which, when ignited, gives off heat sufficient to dry the peat piled within the shed. These furnaces or chambers A are formed of sheet iron or any other suitable material, having a quadrangular framing at bottom provided with five bars or perforated plates, or other similar contrivance, as may be found most convenient. The sides of these chambers incline inwards pyramidically, but, although I prefer square based chambers or furnaces, I at times use circular based or conically shaped furnaces, which are desirable and effective. Each chamber is made moveable by being mounted on wheels or otherwise, so as to be taken out of the air chamber to admit of the peat being packed in the chamber or furnace, which is done most conveniently by turning it over on its side and packing it through the bottom. These furnaces A are placed within a space or chamber formed by slanting iron plates B, B, placed immediately over the ash pit, and forming a continuous air chamber from one end to the other of the kiln or shed. B*, B*, are doors for closing the ends of the chambers, which must be of a sufficient capacity to allow of an air space all round each furnace. The plates B, B, are pierced with rows of holes, decreasing gradually in diameter upwards. The fire boxes are stationed at equal distances apart on the line or tramway, and immediately beneath vertical pipes or funnels C, C, C, attached to the upper part of the chamber formed of the plates B, B. These pipes are intended to receive and surround the several pipes D, D, D, which carry off the smoke and gases from the burning fuel within the fire boxes. The upper end of each of the pipes C, C, C, is closed so as to confine the heated air which would otherwise rapidly pass off, but an opening is made in the cover or closing plate to allow of the pipes D, D, D, sliding up and down freely in guides provided for that purpose. The object of giving the pipes D this motion is, that they may be drawn upwards out of the way of the fire boxes as they are moved into the shed, but when these boxes are arranged in their proper positions the pipes D are lowered so as to fit over the circular opening formed in the top of the fire boxes as before mentioned. E, E, E, are beams which form the skeleton of the frame on which the peat is piled. The peat to be dried is piled up on either side of the air chamber B, B, and to such a height as the shed admits of; and in order to keep rain or the moist atmosphere from falling upon the peat, and yet allow the wind to act upon it when artificial heat is not being employed, a covering composed of a series of shutters H, H, H, overlapping each other when closed somewhat like a venetian blind, is constructed, which may be readily opened or closed at pleasure. These shutters are made of any

Rogers' Improved Methods for the Preparation of Peat, &c.

convenient length (two, three, or more sets placed side by side will be required to cover the whole of one side of a shed), and they are furnished at their ends with pivots which drop into sockets cut in the sides of the slanting beams E, E, E, as shewn at Fig. 3, and support them in their places. *d, d,* are rods
5 which are temporarily connected to the ends of the shutters, and are intended to open and close a series of them simultaneously by the action of a lever *b.* *c, c,* are legs which hang from the underside of the shutters, and lie in a recess cut in the shutters to receive them when the shutters are closed, but when the shutters are opened the legs *c* keep them in that position by resting respectively
10 on the shutter immediately below; by this means a sort of ladder is formed up the outer side of the shed, and the workman is thereby greatly facilitated in the operation of filling in the peat. In effecting the piling of the peat he proceeds in the following manner:—He first covers the floor of the shed and kiln with the blocks, and piles them up as high as he can conveniently
15 reach; he then puts the lowest shutter in its place by dropping its pivots into the sockets cut in the side framing of the shed, and places a block or blocks *a* (see Fig. 3) under the shutter to keep it up and form a step; the upper shutters, having legs *c, c,* as before stated, are then applied as required, and form steps for the workman to reach his work with convenience.
20 He then proceeds alternately to pile up the blocks of peat in the shed, and to apply the shutters until the shed is filled and the shutters are all put in their places. The side rods *d* for opening and closing the shutters are then attached, and the artificial drying is ready to be commenced. The ashpit is entered by the door I, and the peat in the fire boxes or chambers A is fired from beneath the
25 fire bars; the dampers *d*^{*} situated immediately above the pipes D, being raised by means of their respective rods *e* to effect a proper draught for ignition, and closed down tightly when the fires are required to be extinguished. As soon as the peat to form the charcoal is fired care must be taken to regulate the combustion, so that it shall proceed slowly according to the
30 ordinary mode of charcoal burning. This may be readily effected by means of the ashpit door I and the dampers *d*^{*}, which place the operation completely under the command of the attendant. By referring to the Drawings it will be seen that while the fires are being supplied with air (which passes along the ashpit and between the fire bars) the chamber formed by the plates B, B, also
35 receives a supply, and this air, being in contact with the heated surfaces of the fire boxes and the flues, will become quickly heated, and pass off through the holes in the plates B, B, and distribute itself through the mass of piled peat; at the same time the air surrounding the fire boxes will form a packing, and prevent the peat which is near the fire boxes from being burnt or injuriously

Rogers' Improved Methods for the Preparation of Peat, &c.

affected by the contiguous fires. When the heated air is distributed through the mass of peat it will quickly drive off the greater portion of the aqueous particles which remained therein from the first drying operation, and complete the preparation of the peat for domestic or ordinary uses. When I do not apply the heat obtained from the burning of charcoal (in the furnaces) I 5 employ a blast of air for drying the peat. For this purpose I mount a fan wheel on a shaft in connection with the air chamber B, and drive it with a great velocity, taking care that there shall be no vent for the wind but through the perforations in the plates of the air chamber. The blast will thus be distributed equally through the mass of peat, and drive off the vapour, or 10 instead thereof I make an the fan an exhausting fan, and produce a partial vacuum in the chamber B, the effect of which induces a current of air to flow through the pile of peat, and the aqueous particles flow into the chamber. When large quantities of peat are required to be dried, instead of employing distinct sheds for every pile of peat, as seen in Sheet III., I provide a general 15 covering or roof of any given extent, the sides being formed of shutters, acting in the same manner as before described, and beneath this roof I build up the heaps of peat upon the same plan and principle, but varying the breadth and length and height of the heaps according to the size and number of the furnaces which I use. 20

In Sheet II. the arrangement for a large drying station is shewn. Fig. 4 is a vertical section taken through six rows of piled peat placed side by side, but having a free space all round for the escape of vapour. Fig. 5 is a longitudinal section taken through the first row, and Fig. 6 is a longitudinal section taken through the fourth row. The object of these two sections is to shew that 25 the fire chambers for charring the peat and converting it into fuel may either be moveable or stationary, but at large drying stations I prefer to use both plans, inasmuch as the blast of cold air or the exhausting mode of drying (which modes may probably be most resorted to when large quantities of peat are not required to be charred) can be best applied to those rows of peat which 30 have the air chambers cleared of the fire boxes, whereas the stationary fire chambers will be less expensive to build, and some will necessarily be continuously in use for preparing the charcoal. By referring to Fig. 4 it will be seen that the peat is piled upon slanting beds or frames, and thus the air is allowed to circulate under as well as around the peat. The stationary fire 35 chamber (see Fig. 6) has one flue at its end, and it is filled up with peat by a workman from below, who takes the peat from trucks pushed forward to him on a rail or tram road laid down on the bottom of the ash pit. The fire bars of the fire chamber are removeable. The workman first inserts a few fire

Rogers' Improved Methods for the Preparation of Peat, &c.

bars to form a bed, and then piles the peat thereupon, and this he continues until he has nearly filled the chamber, a space being however left in the upper part of the chamber to form a horizontal flue in connection with the vertical flue, which is provided with a damper to regulate the draft of air to the
 5 fire. The complete filling of the chamber (as far as requisite), and the insertion of the remaining bars, may be effected by opening a door in the end of the chamber. It will now be understood that the drying process under the general roof is, in effect, the same as that before described in connexion with the single roof, the preference of one plan over the other being determined
 10 merely by the amount of work required to be done at the drying station. It is well known that for furnaces or enclosed fireplaces, where the draft is strong, a greater density of fuel is required than the usual peat charcoal naturally possesses, it is therefore necessary for certain purposes to submit the peat to pressure to consolidate the particles, which consolidation is essential to
 15 the production of dense or consolidated charcoal, and this is also particularly necessary when close stowage of fuel is an object, as, for instance, in steam vessels.

To effect the consolidation of the peat, and consequently of the charcoal, I employ an arrangement of machinery shewn in several views in Sheet IV.,
 20 wherein Fig. 1 is a side view of the presser. Fig. 2 is a front view partly in section, and shewn in connection with a steam engine for working, but it may be worked by manual or any other power. Fig. 3 is a plan view of the presser, and Fig. 4 is a partial section taken through the line 1, 2, of Fig. 1. *a, a*, are cast iron standards attached to a bedplate, and forming the main framing
 25 of the machine. At the top of the standards a short shaft *b* is mounted, which carries an oscillating beam *c, c*, in connection with the piston rod of the adjacent steam engine. *d, d*, is a shaft which passes between the standards *a*, at right angles to the shaft *c*, and rests in suitable bearings connected therewith. This shaft at either end supports the wheels *e, e*, which turn loosely thereon,
 30 and at their periphery are furnished with a series of radiating rectangular moulds *f*, open at their ends and intended to receive the peat to be pressed. These wheels are so constructed that they will revolve freely and yet allow of the side pieces *g, g*, of the standards projecting out so as to form a temporary bottom to each mould as it comes by the revolution of the wheel over such
 35 projecting parts, which on their upper face are slightly curved, and fit against the inner ends of the moulds. Pendant from the beam *c* are two plungers *h, h*, which are situated over their respective wheels *e, e*, and are intended, as they are alternately depressed by the oscillation of the beam *c*, to enter the moulds of the wheel *e* (when they are brought over the projecting pieces *g*, of the

Rogers' Improved Methods for the Preparation of Peat, &c.

standards), and compress the peat which has been previously put into the moulds by hand. To facilitate the entrance of the plungers into the moulds, the upper ends of the moulds are provided with lips inclining outwards and forming guide pieces. The plungers *h, h*, are attached to the beam *c* by pivots, which enter slotted bearings as shewn, and an elasticity is given to the pressure 5 of the plunger by means of a strong spring *i*, inserted in a recess in the beam *c*, and acting upon the inner end of the plungers. When, therefore, by reason of a piece of the peat of an extra size being put into moulds, the plunger would, according to its usual adjustment, impart too great a pressure to the peat, the plunger will rise in its socket, and the compression of the 10 spring *i* will absorb the extra amount of pressure. In order to give a rotating intermittent motion to the wheels (which is necessary to bring the moulds round and stay their progress while the pressing operation is being performed) I adopt the following means:—In the face of each of the wheels *e* a zigzag groove *k* is formed, as shewn at Fig. 1, and in the grooves the 15 pins *l* respectively work. *m, m*, are pendant rods jointed to the beam *c*, and receiving a reciprocating motion therefrom. At about a middle of their length they carry the pins *l*, and at their lower ends work respectively through guides or eyes in the ends of the shaft *d*. *n, n*, are ratchet rings bolted to the face of the wheels *e*; and a pawl or click *o*, jointed to 20 an arm *p*, which is supported loosely on the shaft *d*, takes into the teeth of the ratchet ring. A coiled spring *q* forms an elastic connection between the arm *p* and the pendant rod, the use of which will be presently understood. Attached to the rod *m* is a finger *r*, which, as the rod descends by the oscillation of the lever *c*, comes into contact with the arm *p* and forces it down, together 25 with its pawl *o*, which slides over several teeth in the ratchet ring *n*. This movement of the rod *m* causes the pin *l* to traverse the radial portion of the zigzag groove and assume its lowest position; but the same movement of the beam *c* which brings down the rod *m* also forces the plunger *h* into the mould *f*; the rising of the rod *m* and the plunger will therefore be simultaneous, and by the connection of the spring *q* with the arm *p* and rod *m* the 30 wheel *e* will no sooner be free to move than the click *o*, having an upward impulse from the spring *q*, will push the wheel round sufficiently to bring the next succeeding mould under the plunger, the pin *l* in the meantime will traverse the inclined portion of the zigzag groove, and, when arrived at its 35 highest position, will act as a stop to the further movement of the wheel. In order to effect the operation of pressing the peat with the least possible exertion of power I employ an exhausting apparatus simultaneously with the pressing apparatus, and thus I am enabled to draw out the air, and any aqueous matter

Rogers' Improved Methods for the Preparation of Peat, &c.

that may yet remain in the peat, at the time that the plunger is descending upon the block of peat. It will therefore be understood that the plunger will only have to overcome the resistance of the bulk of the solid matters, instead of, as heretofore, meeting with the resistance of air and water, which cannot without

5 great difficulty be expelled from peat, or any other similar mass, by pressure. The exhaustion is effected in the following manner:—The parts *g, g*, of the standards are each pierced with channels radiating upwards, and form a pierced bed or bottom for their respective sets of moulds as the moulds severally come under the plungers. Three channels are connected with a pipe *s*, one for each

10 bed piece *g*, and these pipes lead severally to an exhaust cylinder *t* (see Fig. 4), provided with a valve opening outwards, and also with a piston and piston rod. The piston rods of the two cylinders are connected to opposite ends of a rocking lever *u*, which has its fulcrum on a shaft *v*, and on the same shaft is an arm *w* (see Fig. 2), attached by a connecting rod *x* to an arm *y* on the shaft *b*; when,

15 therefore, the plungers, by the rocking of the beam *c* on its shaft *b*, are depressed, a corresponding motion will be given to the exhaust pistons, which will draw the air or water from the moulds into the cylinders *t*, and on rising force it out at the valves thereof. The compression of the fuel will cause it to remain in the moulds after the pressure is withdrawn; the plungers *Z*

20 are therefore provided for clearing out the mould. These plungers are jointed to vibrating levers *z**, on the shaft *v*, and move simultaneously with the piston rods. They are guided in their vertical motions by their rods forming a link, the straight sides of which work in grooves cut in the boss of the wheel *e*, which boss they embrace. The plungers *z* are so situated as to act upon the

25 compressed peat in the moulds, when the moulds attain their lowest position in their rotation, and the compressed blocks of peat are thrust out of the moulds into baskets placed for their reception. In order to solidify the dust or small particles of peat charcoal (which, in the general manufacture, is produced in large quantities), and render it applicable as a fuel, I intermix with the dust

30 or small particles mucilaginous matters composed of animal or vegetable gluten, albumen, or starch, in the proportions of about two parts of glutinous or mucilaginous matters to about eight parts of charcoal. This operation may be advantageously effected by means of an ordinary pug-mill, and by the employment of a moulding machine in connection therewith, or by panel

35 moulding. The combined charcoal may be moulded into bricks or cakes, or into forms to resemble wood, which are then dried by any convenient means.

The second head of my Invention refers, as before stated, to the manufacture of granulated peat charcoal, to be used as a deodorizing agent, and, in combination with certain substances, as a compost or manure. It is well known

Rogers' Improved Methods for the Preparation of Peat, &c.

that as a general manure that which contains the largest amount of ammoniacal salts is the most valuable; but, inasmuch as these salts are very volatile, they are generally lost by evaporation according to the present mode of treating and using as a manure animal excrement, which contains these valuable properties in abundance. It is also known that animal excrement cannot be properly used as a manure without dilution. Now, I have ascertained by many experiments that peat charcoal possesses considerably greater absorbing powers than the generality of wood charcoal, and that by reason of the strong affinity which exists between carbon and ammoniacal and other gases, the odours arising from animal excrement are taken up and destroyed when contact and intimate admixture with the charcoal takes place. In manufacturing the peat into granulated charcoal to be used as an absorbent of the ammoniacal gases arising from animal excrement, and for diluting the same sufficiently to make a useful marketable manure, I proceed in the manner before described for the obtaining peat charcoal, and, when so obtained, I subject it to the operation of grinding until it is reduced to grains about equal in size to those of coarse gunpowder. I then employ it in the following manner:—In order to retain all the volatile products and other fertilizing properties, so as to apply them beneficially to the purposes of agriculture, I intermix, by hand labor, or by any convenient machine, granulated peat charcoal with animal excrement, using the charcoal in such quantities as will be sufficient to absorb the aqueous and volatile products of the excrement, and destroy the effluvium. To obtain these results, and prepare a marketable manure of such a strength as will be immediately available for agricultural purposes, I add to the excrement an amount of peat charcoal exceeding in weight that of the excrement; thus I find that two parts by weight of charcoal and one part by weight of excrement from towns will produce an inodorous manure; but I do not confine myself to those proportions, so long as the desired result is obtained by adding an excess by weight of peat charcoal to animal excrement. By this means I obtain an apparently dry powdered inodorous mixture of sufficient strength (or rather dilution) to be advantageously applied either to arable or pasture land, and which is capable of transport in barrels or sacks by the ordinary modes of conveyance. To prevent the evils which arise from the odours of animal excrement of towns I apply granulated charcoal to the separate receptacles for such matters, either in the entire quantum required to destroy the effluvium, or in such quantity as will prevent injurious exhalation, and thus render it more convenient for transport to a place where the process of perfect mixing can be conveniently carried into effect; peat charcoal in lumps, or in small unequally sized pieces, or in fine dust, will absorb the aqueous and volatile products of animal excrement,

Rogers' Improved Methods for the Preparation of Peat, &c.

and destroy the effluvium to a certain extent, varying according to the mode and form of application; but I prefer to employ the granulated peat charcoal for that purpose, as well as for preparing the compost or manure. Peat charcoal may likewise be advantageously employed as an absorbent of the sewage water
 5 from farmyards and stables, and also as an absorbent of other kinds of liquid manure.

Having now described the nature of my Invention, and the manner of carrying the same into effect, I wish it to be understood that, under the above described Letters Patent, I claim,—

10 Firstly, as respects the drying of peat, the employment of moveable sheds for protecting the trays of cut peat from the weather, and yet allowing a current of air to pass between and over the layers of peat, so as to partially dry the peat before it is removed from the bog lands to the station.

Secondly, I claim the peculiar construction of drying shed above described,
 15 with reference to Sheet III. of the Drawings for drying peat (whether such shed be made to contain one or more clamps or heaps of piled peat), whereby the peat will be protected from the weather; the moisture, when driven off from the peat, will be allowed to escape into the atmosphere; and, when required, air may be allowed to circulate freely around the pile of peat.

20 I also claim the arrangements of fire chambers (or charcoal burning chambers) and air chambers, shewn in Sheets II. and III. or any analogous arrangements whereby I am enabled to avail myself of the heat given off by the charred peat for evaporating the moisture from fresh cut peat.

And further, I claim the use of the perforated chamber B, Sheet III.,
 25 and fan wheels, for extracting or evaporating the moisture from piles of peat by exhaustion, or by the application thereto of a blast of air.

And, as respects the manufacture of charcoal, whether for the purpose of fuel or as an ingredient for a manure, I claim the charring of peat in chambers or vessels as above described, whereby the admission of air thereto, when
 30 the combustion of the peat has proceeded to an extent sufficient to produce carbonization, may be readily cut off, and the fire quickly extinguished.

With respect to the machinery for compressing peat fuel, I claim the arrangement of parts constituting the compressing machine as described with reference to Sheet IV. of the Drawings.

35 And particularly, I claim the application to such machine of an exhausting apparatus, whereby the extraction of the air and aqueous particles contained in the substance under operation, may be effected simultaneously with the compression of the mass.

And lastly, as respects the combination of peat charcoal with certain sub-

Rogers' Improved Methods for the Preparation of Peat, &c.

stances as a compost or manure, I would remark, that I am aware it has been proposed to mix with earths and a variety of refuse materials charcoal dust, charred saw dust, and other analogous vegetable matters in small quantities; but this has been rather for the economical employment of the charcoal dust and other analogous matters which would be otherwise useless, than for effecting a 5 defined and previously unattained object. I therefore wish it to be understood that I lay no claim to the broad principle of employing peat charcoal as an element in the manufacture of manure. But I claim the application of peat charcoal (granulated I prefer) to animal excrement, in such quantities as shall deodorize the same by chemically retaining the volatile gases in the manure; 10 and also the admixture of peat charcoal in such quantities and proportions with animal excrement as shall produce a dry pulverulent manure, suitable, without the addition of other ingredients, to the manuring of arable and meadow land.

In witness whereof, I, the said Jasper Wheeler Rogers, have hereunto 15 set my hand and seal, this Twenty-fifth day of November, in the year of our Lord One thousand eight hundred and forty-eight.

JASPER WHEELER (L.S.) ROGERS.

AND BE IT REMEMBERED, that on the same Twenty-fifth day of November, in the year above mentioned, the aforesaid Jasper Wheeler Rogers 20 came before our Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained, in form above written. And also the Specification aforesaid was stamped according to the tenor of the Statute in that case made and provided.

Inrolled the First day of December, in the year above written.

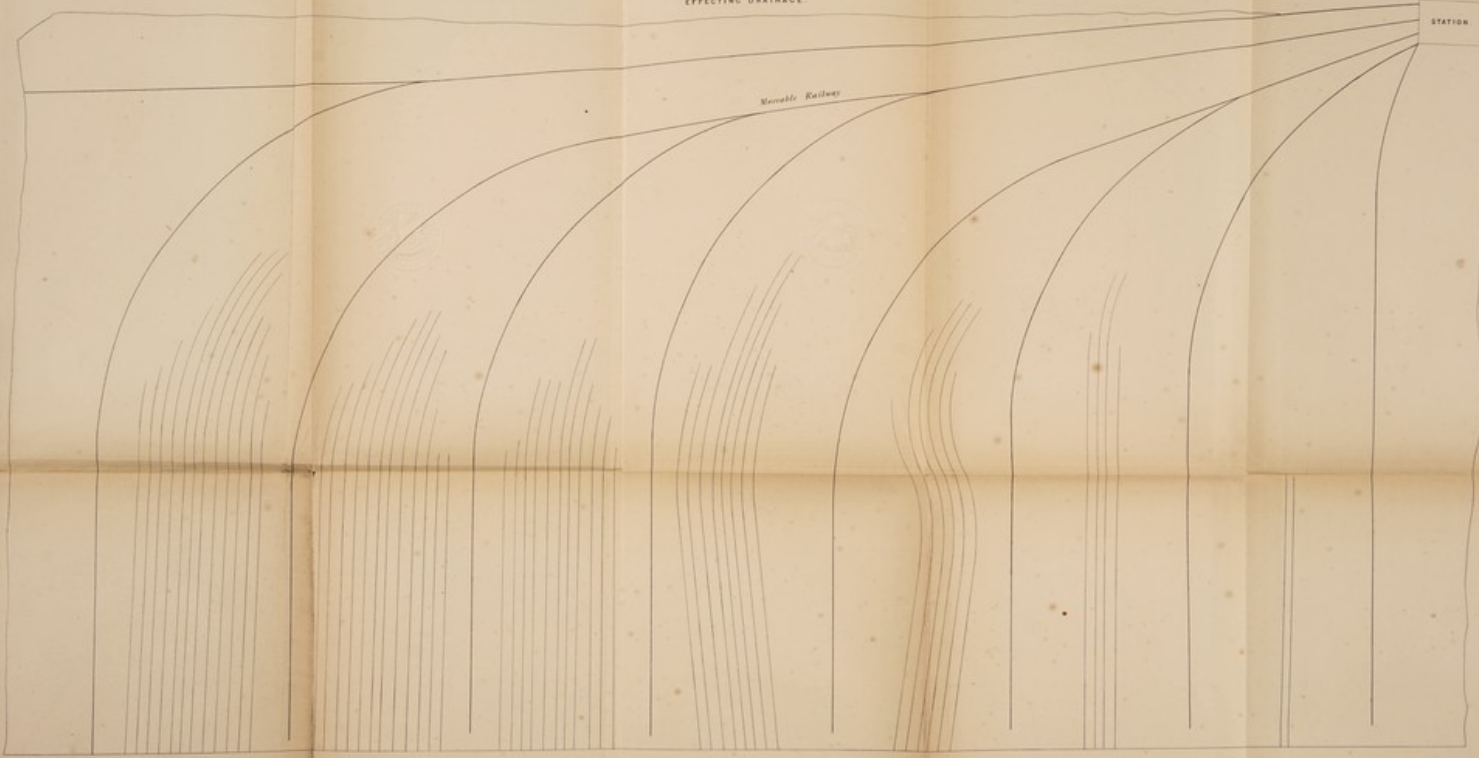
25

ARCHIBALD H. GODDARD,
Master Extra. in Ireland for the
High Court of Chancery in England.

LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1855.

PLAN
SHOWING STATION & CUTTINGS
FOR
EFFECTING DRAINAGE.



TRANSVERSE SECTION OF DRAINS



The detailed drawing is referred

Source: Digitally scanned from the original drawing and printed by permission of the British Library.

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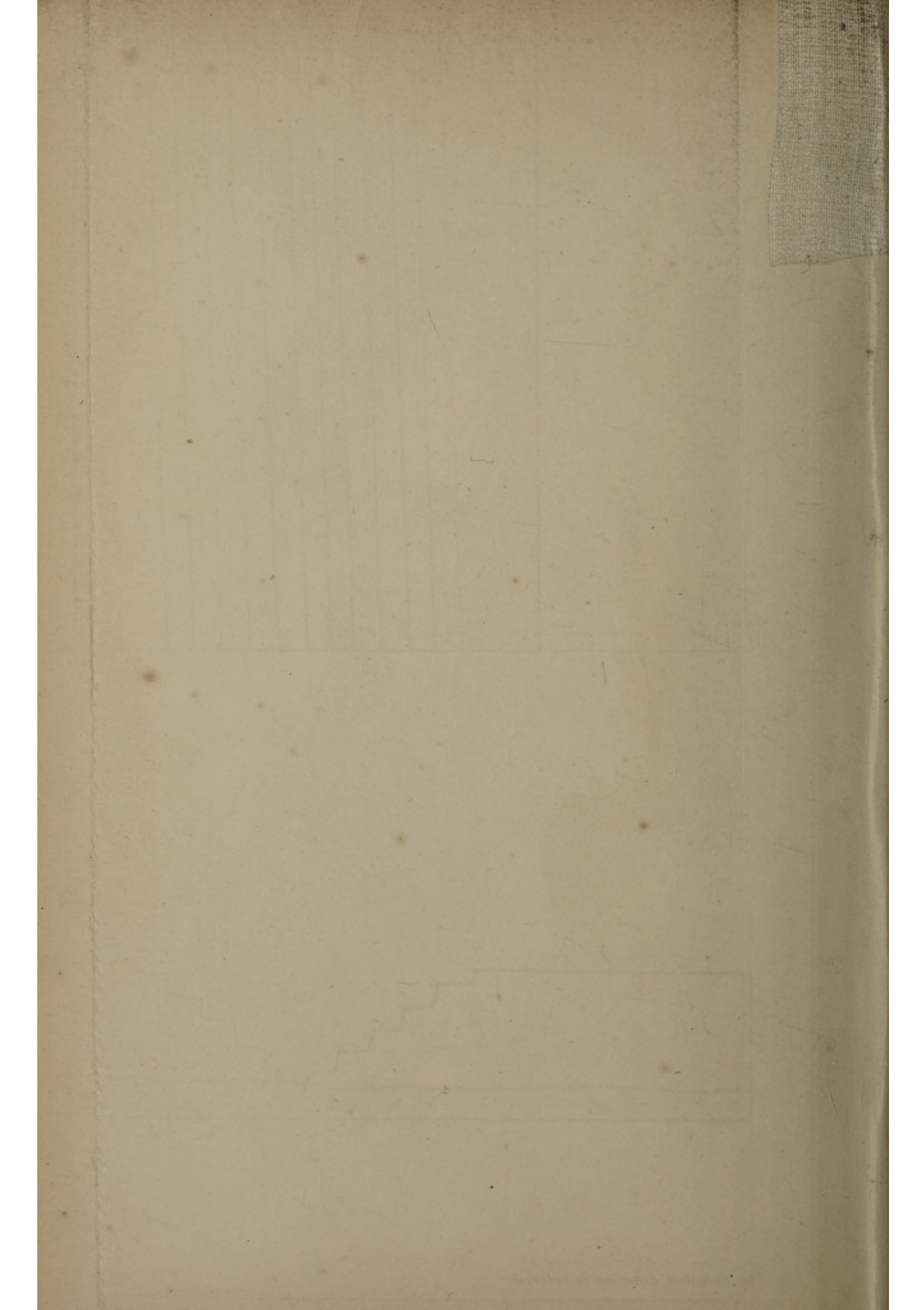
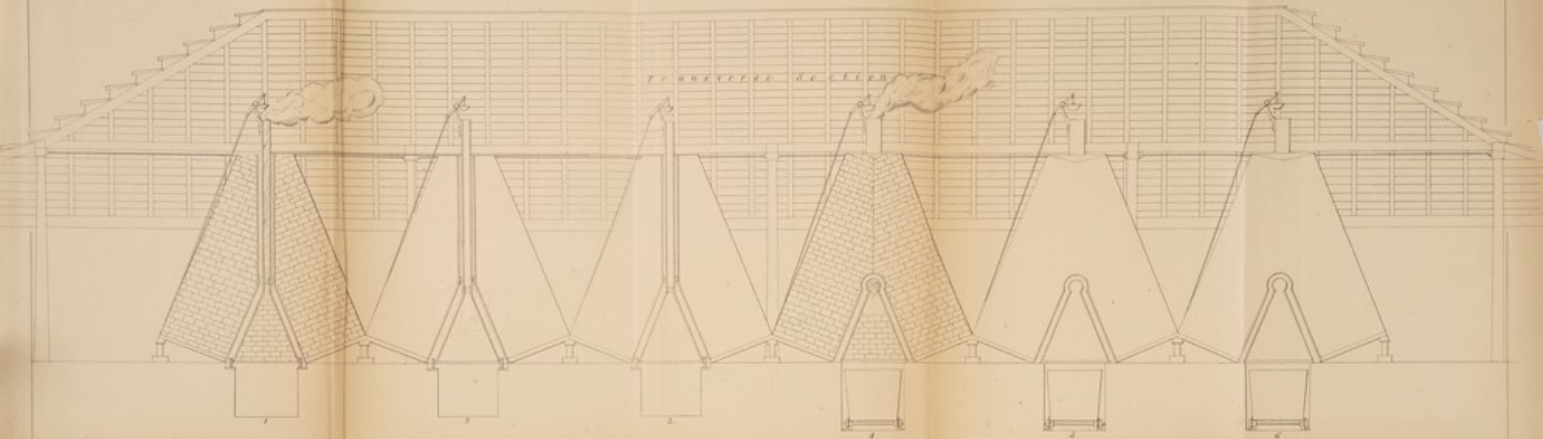


FIG. 4.



FIGS. 1 & 2.

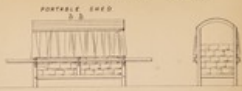
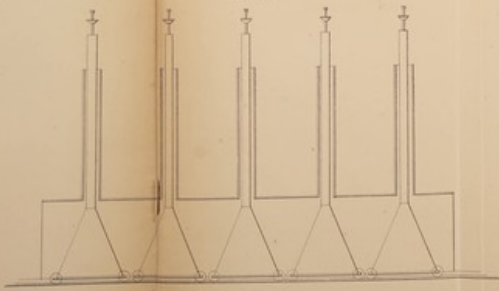
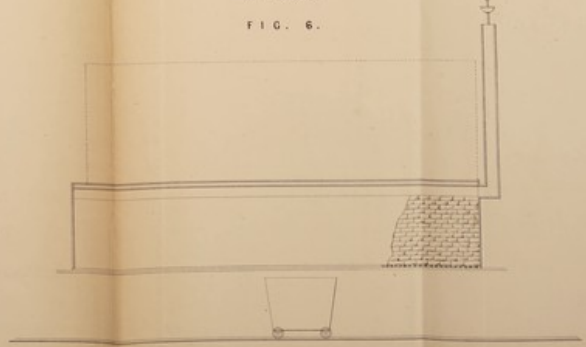


FIG. 3.

Longitudinal Section
of 1, 2 & 3.



Longitudinal Section
of 4, 5 & 6.



The omitted drawings are not entered.

Engraved by George Lewis Fryer and William Scott, London.
Printed by the University of London, 1845.

Drawn on Stone by Wm. & A. Stone.

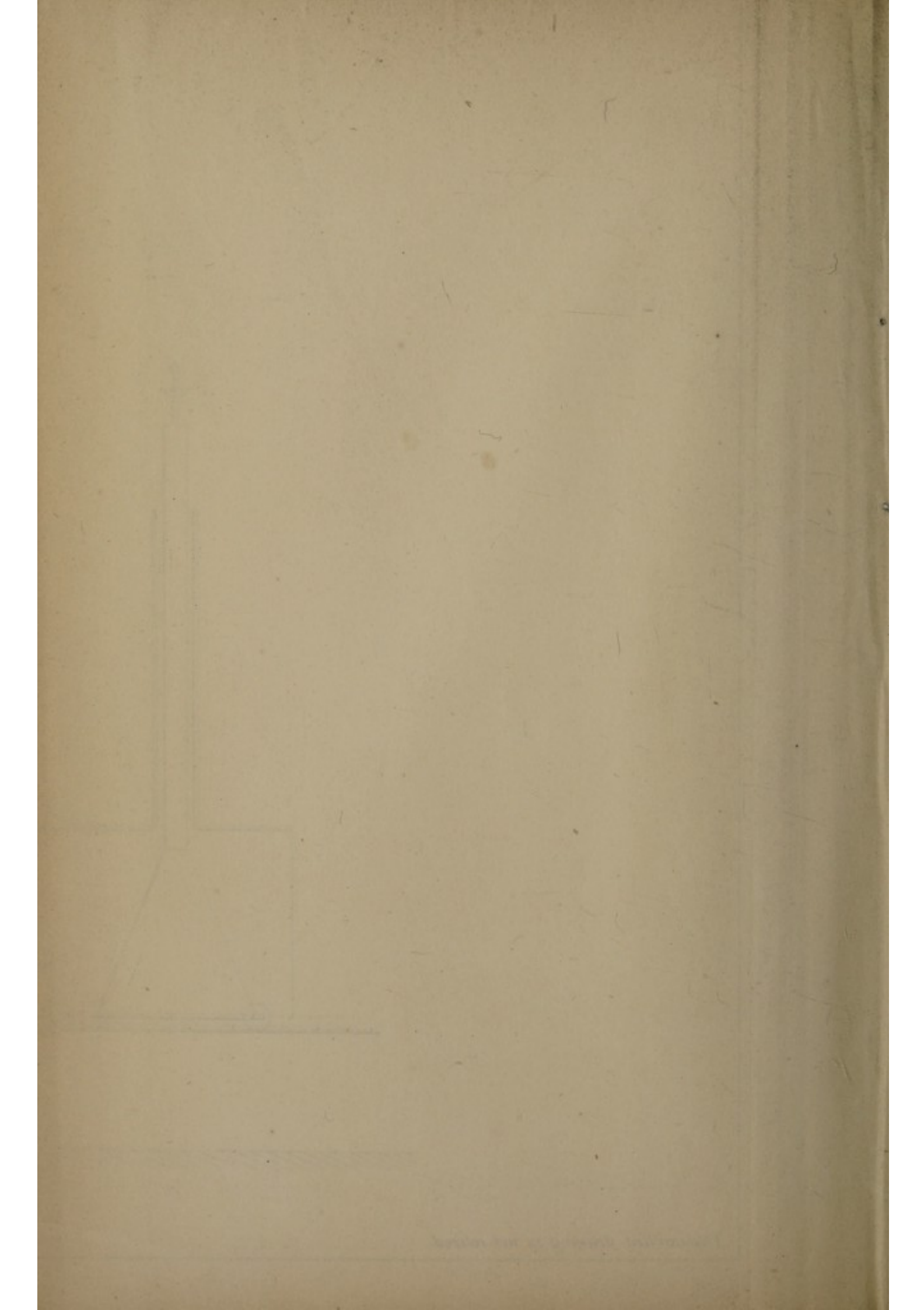


FIG. 1.

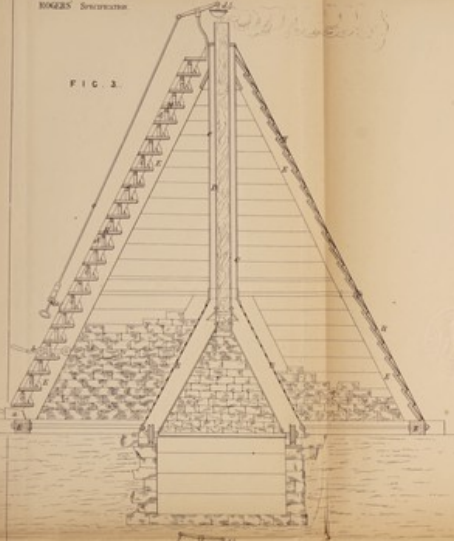


FIG. 2.

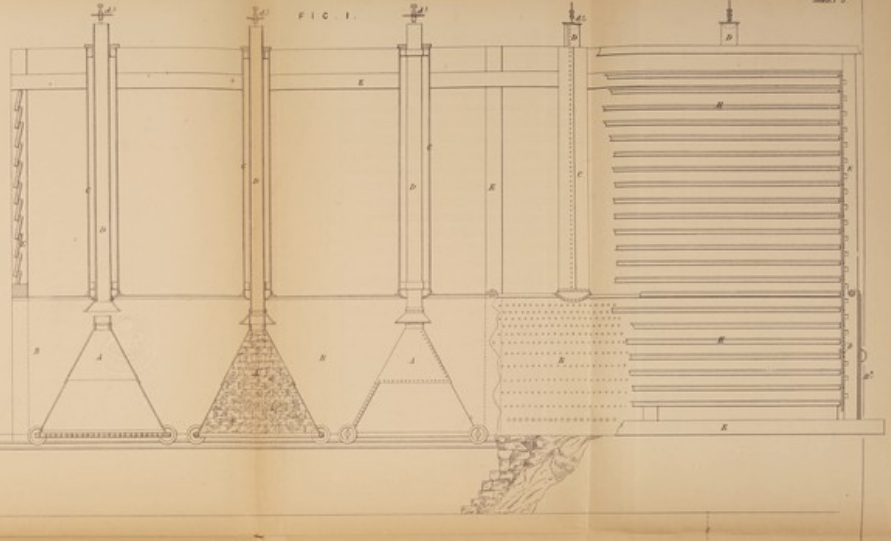


FIG. 3.

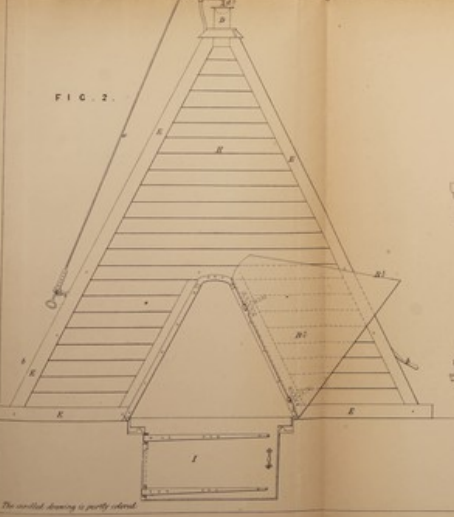
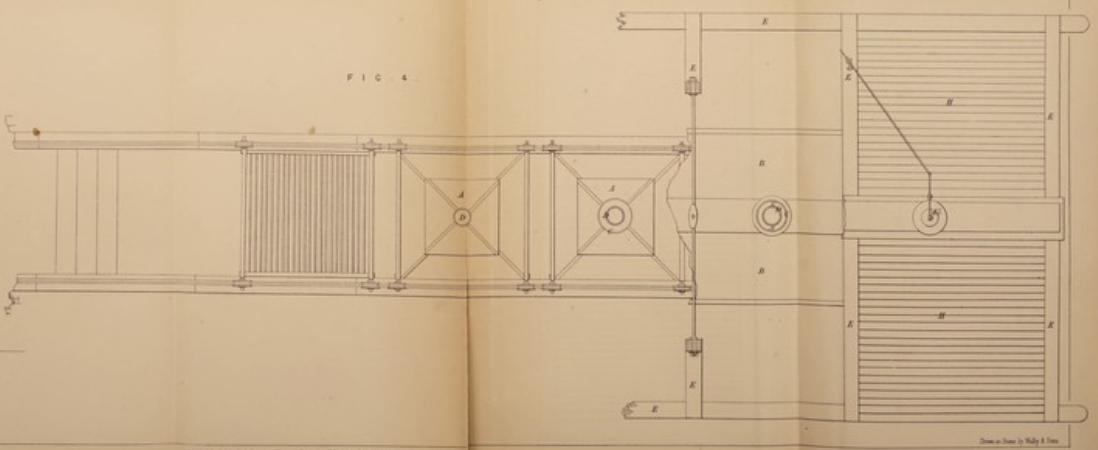


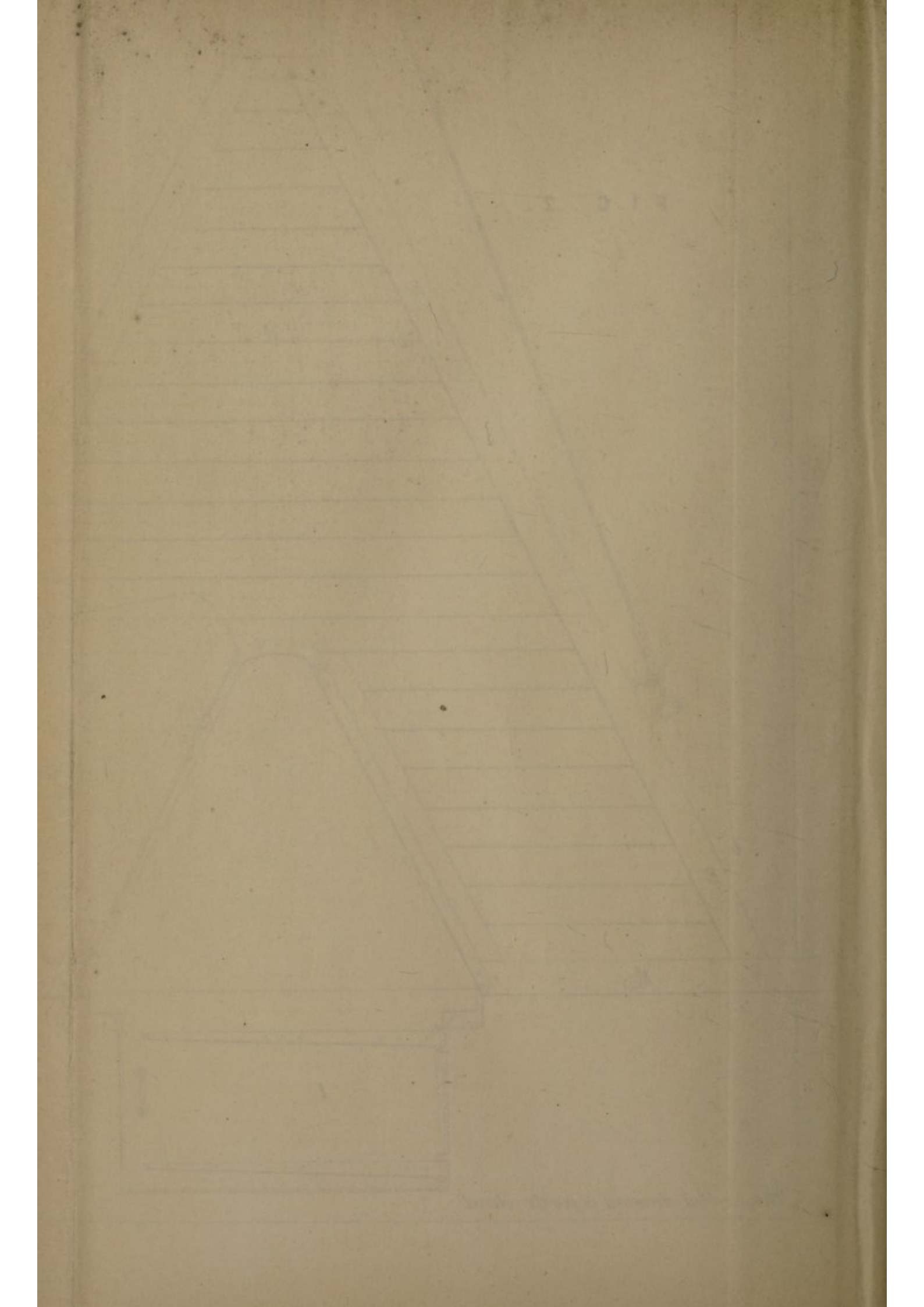
FIG. 4.



The omitted drawing is partly referred

Reference: Sewerage, Rogers' Jour. and Rogers' Sewerage
Printed by the Government Lithographic Office, 1846.

Drawn in Stone by Wm. J. Stone



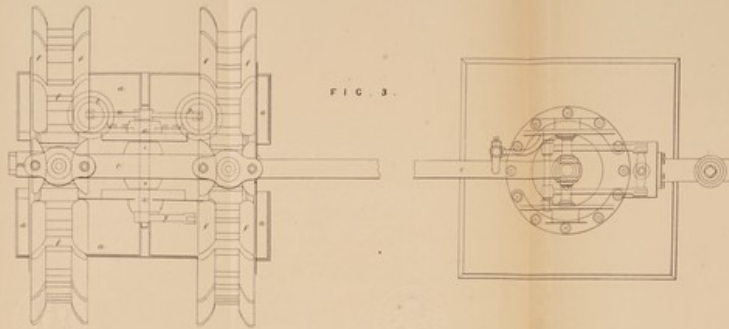


FIG. 1.

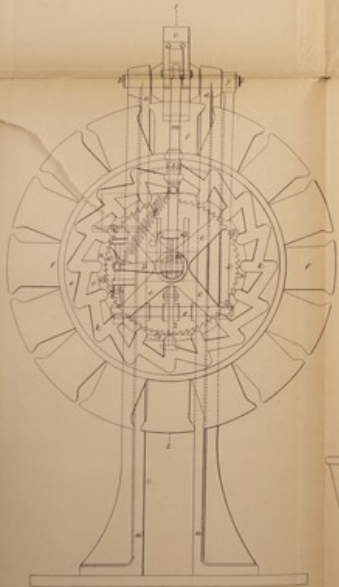


FIG. 2.

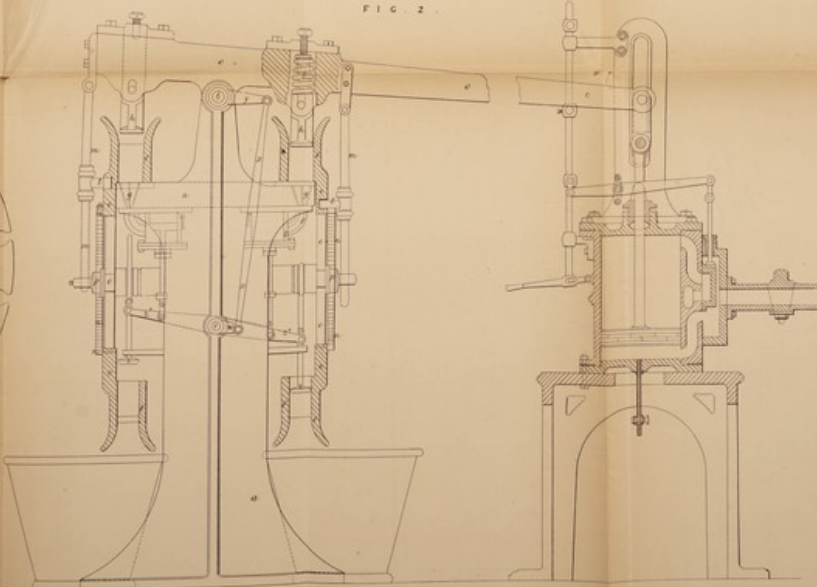
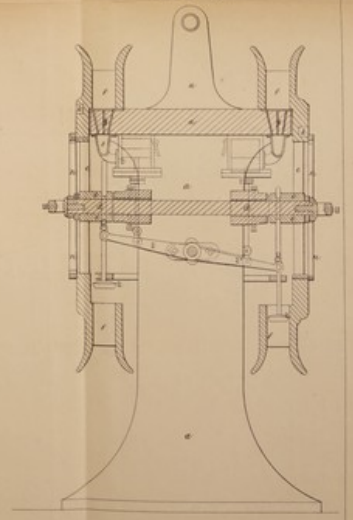


FIG. 4.



The vertical drawing is partly colored.

LONDON: Published by G. ROGERS, at the Office of the Patent Office, No. 15, Pall Mall.

Drawn in Paris by M. J. G. & Co.

