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A.D. 1850 . . . . . N<sup>o</sup> 13,258.

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

OF

JASPER WHEELER ROGERS.

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PREPARATION OF PEAT AND  
MANUFACTURE OF FUEL.

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ROGERS' SPECIFICATION.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JASPER WHEELER ROGERS, of Dublin, Civil Engineer, send greeting.

WHEREAS Her present most Excellent Majesty Queen Victoria, by Her Royal Letters Patent, under the Great Seal of Great Britain bearing date  
5 at Westminster, the Nineteenth day of September, in the fourteenth year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Jasper Wheeler Rogers, Her especial license, full power, sole privilege and authority, that I, the said Jasper Wheeler Rogers, my exors, admors, and assigns, and such others as I, the said Jasper Wheeler Rogers,  
10 my exors, admors, 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 Colonies and Plantations abroad, and in the Islands of Jersey, Guernsey,  
15 Alderney, Sark, and Man, my Invention of "CERTAIN IMPROVEMENTS IN THE PREPARATION OF PEAT, AND IN THE MANUFACTURE OF THE SAME INTO FUEL AND CHARCOAL;" in which said Letters Patent is contained a proviso, obliging me, the said Jasper Wheeler Rogers, by an instrument in writing under my hand and seal, particularly to describe and ascertain the nature of my said Inven-  
20 tion, 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 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.

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*Rogers' Impts. in the Preparation and Manufacture of Peat into Fuel, &c.*

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NOW KNOW YE, that in compliance with the said proviso, I, the said Jasper 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 ascertained in and by the following description thereof, reference being had to the Drawings hereunto annexed, and to the letters and figures 5 marked thereon (that is to say) :—

It is well known that in the manufacture of peat considerable loss arises from the upper surface or more porous part of the bog being obliged to be removed and thrown aside, so as to get at the more dense stata underneath. It is also well known that in bringing the peat to a nominally dry state considerable loss is sustained from the friability of the sods or pieces, as large quantities of peat mould, or technically speaking "mull," accumulate, which are useless or of little value. 10

Now the object of the present Invention is, first, to obviate these evils, and convert this accumulating refuse into a valuable product; and, secondly, to 15 render more perfect and effectual the system of charring or carbonizing peat, as described in the Specification of a Patent granted to me by Her present most Excellent Majesty, and bearing date the First day of June, One thousand eight hundred and forty-eight.

The means whereby I am enabled to utilize the "upper surface" of the 20 bog and the peat mould or "mull," and produce fuel or charcoal therefrom, will be understood from the following description thereof, reference being had to the Drawing forming part of this my Specification.

When the upper surface is being removed I place it in pyramidal or other shaped heaps in any convenient place where the rain will not lodge, and 25 where the moisture may run away. After giving it as much time as I conveniently can to dry, I remove it to the drying house or building particularly described in my former Patent, where it is intermixed with the dry mull or mould which accumulates from the friability of the peat. This intermixture is effected by hand labor, or by machinery constructed upon the same principle 30 as the "pug mill," the material having been previously screened to keep back all pieces exceeding a cubic half inch in bulk. When this mixture has been properly effected I subject the material to the operation of heat in the apparatus shewn in the Drawing, which apparatus is set up in a shed similar to those described under my former Patent. 35

Fig. 1 is a longitudinal section of the apparatus, and Fig. 2 is a cross section of the same. The material to be operated upon is placed in a hopper or chamber A, situate at one end of a chamber or trough B, B, B, which extends from one end to the other of the shed, and is supplied with the mixed

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*Rogers' Impts. in the Preparation and Manufacture of Peat into Fuel, &c.*

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material from the hopper A. In this trough a screw C, C, C, revolves, for the purpose of propelling the material forward as it falls from the hopper. The trough B, B, B, which I term the charring and carbonizing chamber, is suspended to or secured within the air chamber, shewn in the Drawing, and  
5 described in my former Patent, and over the furnaces in which the charring of the peat takes place; the caloric or heat collected within this air chamber is very considerable. D, D, is a double furnace, opening at each side of the air chamber, and extending through it at the end farthest from the hopper, and E, E, is a flue running from thence, and terminating in the funnel F, which  
10 communicates with the main funnel G. In the furnace D, D, is placed the peat, which is now required to be brought to a red heat, in order to ignite the peat contained in the pyramidal furnaces H, H, H. At present all the gases given off from the peat thus used are lost, as the ignition takes place in heaps prepared solely for that purpose. By my new method all the caloric yielded  
15 up until the fuel is brought to the required state is applied to heat the trough B, B, B, and thereby effect the charring or carbonization of the material contained therein. This operation is further assisted by the heat given out from the furnaces H, H, H. The peat is left in the furnace D until all its flame is given off, and it is then discharged from either side of the furnace alter-  
20 nately when wanted to ignite the peat in the furnaces H, H, by letting down the fire bars, as shewn by dots in the Drawing, and allowing the red hot peat to drop into a barrow, which is covered and wheeled away. By this discharge of the ignited peat from either side of the furnace alternately, a continuous heat is kept up, which will greatly assist in effecting the charring or car-  
25 bonizing of the peat in the trough or chamber B. One end of the shaft of the screw C carries a cog wheel I, which is driven by any convenient motive power, and thereby causes the screw to rotate, and propel forward the intermixed "mull" and "upper surface," which falls from the hopper A into the trough B, B, B. By this means every particle is being constantly turned and  
30 acted upon by the heat, and the result is, that the material, after passing along about two-thirds or three-fourths of the length of the trough, loses all its moisture, and in completing its passage to the end of the trough becomes thoroughly charred or carbonized. It is to be observed that from two-thirds to three-fourths of the trough where the drying takes place is open at  
35 top, but the remainder, where carbonization is effected, is closed.

Hitherto it has been found a matter of some difficulty after the completion of the charring or carbonizing operation to cool the incandescent mass, and prevent the rapid oxidation and consequent waste of the charcoal, when exposed to the air in a red hot state. The manner in which I propose to effect

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*Rogers' Impts. in the Preparation and Manufacture of Peat into Fuel, &c.*

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this object is as follows :—Near the carbonizing end of the chamber or trough B, B, B, a cylinder K is provided. This cylinder is mounted on hollow gudgeons, and is caused to rotate by means of the shaft and pinion L & M, in connection with any first mover. The lower side of the cylinder K rests in a trough of water, supplied from the perforated pipe N, which gives a 5 constant sprinkling of water over the whole cylinder. Inside the cylinder and attached to the periphery thereof, is a screw thread of the same pitch as the screw in the carbonizing chamber; the same speed of rotation is given to both these screws. The charred or carbonized peat having passed up an incline formed by a hollow cone attached to the end of the chamber B, B, B, and 10 projecting into the hollow gudgeon of the cylinder K, delivers itself into the cooling cylinder, where it is turned over and propelled forward by the rotating thread on the inner periphery thereof, and thus every particle is in its turn brought into contact with the cooling surface of the cylinder, and the caloric which it contained, is quickly abstracted. The charcoal thus reduced to the 15 ordinary temperature is now by the continued rotation of the cylinder delivered at the opposite end thereof, to which it entered, and after ascending an incline and passing through the hollow gudgeon, it falls into a receptacle placed to receive it. The object of making the ends of this cylinder conical, is to allow its immersion in water, without the water being able to enter the interior 20 through the ends.

Fig. 3 shews a modification of the above described arrangement for charring or carbonizing, and afterwards cooling, the peat refuse. O, O, is a conical chamber (the axis of which is horizontal) communicating with a hopper P, and forming a channel with a downward and upward incline, by the 25 base or larger diameter of the cone being the discharging end. The peat refuse to be dried passes downwards freely along the channel, and on its passage is acted upon by the heated surface thereof, whilst the moisture that is driven off traverses upwards without check along the upper incline, and passes out at the funnel Q. At R the discharge of the peat in a dry state takes place, and 30 when made up into blocks it may be used as ordinary fuel for general heating purposes; but when the peat is desired to be converted into charcoal, it is conducted from the drying chamber into the charring or carbonizing chamber which is provided with a rotating screw, as before explained, for turning over the peat, and submitting every part to the action of the heating surface. 35 When the carbonization is effected, the incandescent charcoal is delivered from thence into the cooling chamber, as before described.

I would here observe, that the length and diameter of the screws and cylinders will vary according to the quantity of charcoal required to be

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*Rogers' Impts. in the Preparation and Manufacture of Peat into Fuel, &c.*

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produced, and the nature of the "mould mull or upper surface," to be acted upon. In the Specification of my Patent, before-mentioned, I have described a mode of charring peat by piling it up in pyramidal furnaces from which the air is to be excluded at a certain period of the process, but as a more perfect  
5 exclusion of atmospheric air than has yet been attained is essential to the economical and abundant production of charcoal from peat, I have invented the following means for effecting this object.

It will be seen by the Drawings that the pyramidal furnaces are placed under an air chamber, according to my Patent of One thousand eight hundred  
10 and forty-eight, but instead of an ash-pit being made from end to end of the shed, with doors to close and exclude the air from the burning mass of peat in the furnaces, (which plan in practice I have found required greater nicety of workmanship than was desirable,) I form a shallow tank which extends from end to end of the shed to receive the pyramidal furnaces containing the peat  
15 to be operated upon, and I run these furnaces, which are mounted on wheels, into and out of the tank over inclined planes at either end thereof, as shewn in the sectional elevation, Fig. 1. The furnaces being placed in this tank the process of burning takes place, and as soon as the masses of peat within the furnaces are brought to a red heat throughout, water is admitted by a pipe  
20 prepared for the purpose into the tank, and rising to the height shewn by the red line, or about an inch or two above the bottom edge of the furnace sides, the passage of the air between the fire bars will be immediately cut off, the furnaces are then closed at top, according to the mode stated in my Patent of One thousand eight hundred and forty-eight, and the charring operation is  
25 completed in the space of four, five, or six hours.

Having now described my Invention, and the manner of carrying the same into effect, I wish it to be understood, that under the above in part recited Letters Patent, I claim as my Invention of improvements in the preparation of peat, and in the manufacture of the same into fuel and charcoal, first, the  
30 means herein-before described for treating the general refuse of bogs, and the "dust and mould," or "mull" of peat, so as to convert it into fuel or charcoal; and, secondly, I claim the mode of excluding the atmospheric air from the charring or carbonizing furnaces, as above described.

In witness whereof, I, the said Jasper Wheeler Rogers, have hereunto set  
35 my hand and seal, this Seventeenth day of March, in the year of our Lord One thousand eight hundred and fifty-one.

JASPER W. ROGERS. (L.S.)

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*Rogers' Improvements in the Preparation and Manufacture of Peat, &c.*

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TAYLOR, Extra.

AND BE IT REMEMBERED, that on the Seventeenth day of March, in the year of our Lord 1851, the aforesaid Jasper Wheeler Rogers came before our said Lady the Queen in Her Chancery, and acknowledged the Specification aforesaid, and all and every thing therein contained and specified, in form above written. And also the Specification aforesaid was stamped 5 according to the tenor of the Statute made for that purpose.

Enrolled the Nineteenth day of March, in the year of our Lord One thousand eight hundred and fifty-one.

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FIG. 2.

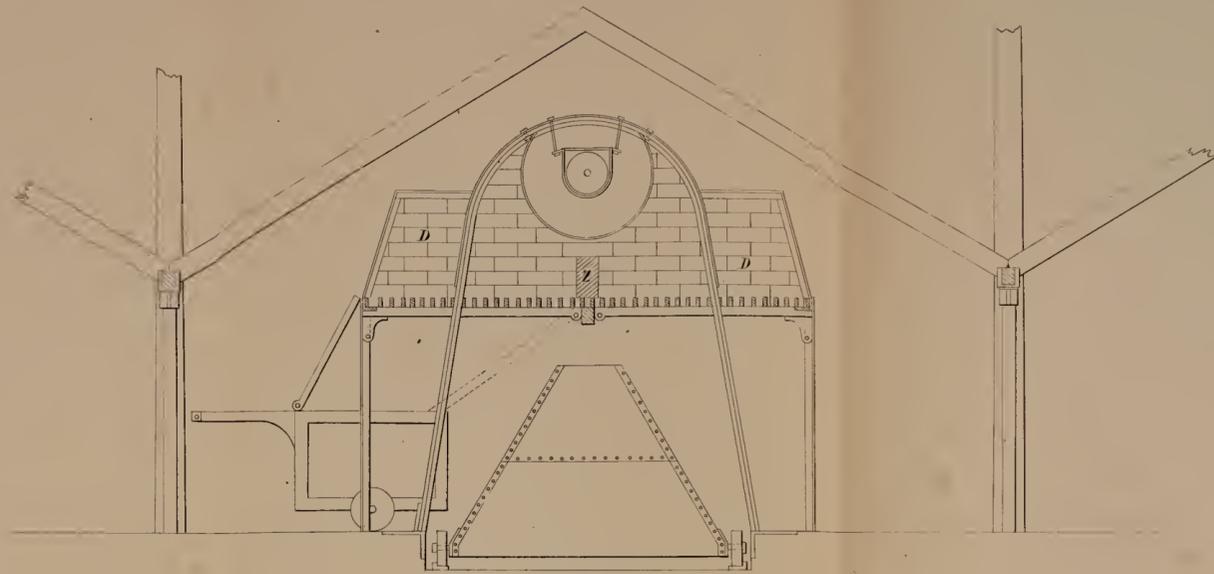


FIG. 1.

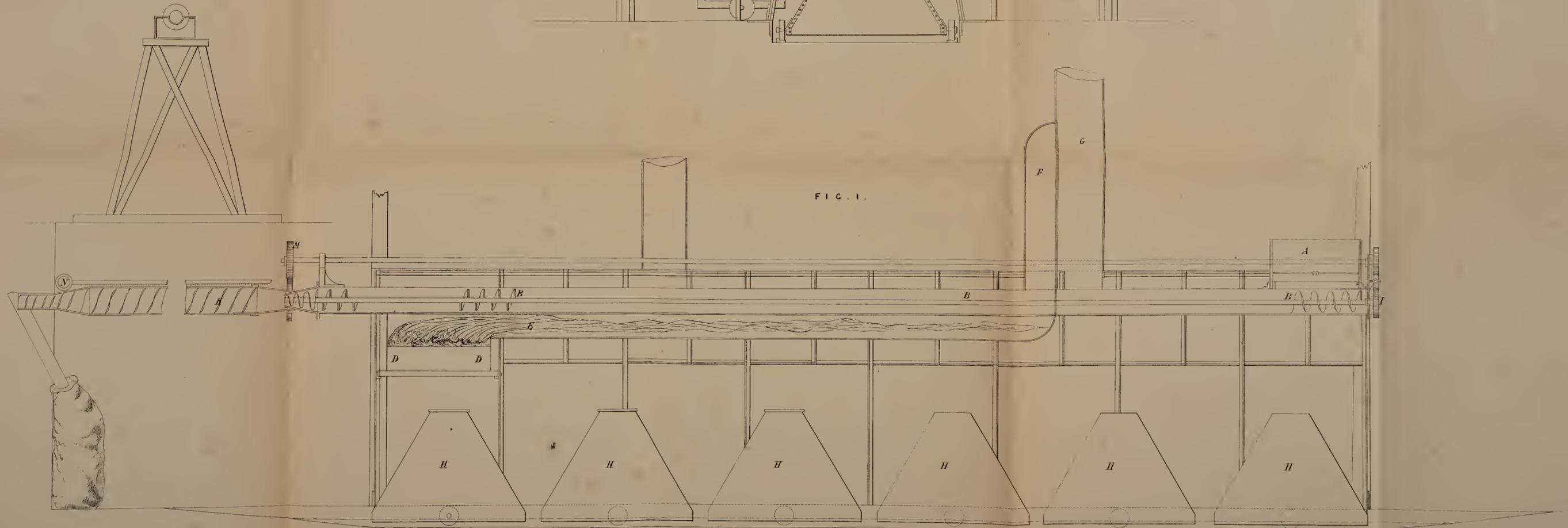


FIG. 3.

