3 Sheets--Sheet 1.

H. CLAYTON, H. CLAYTON, Jr., & F. HOWLETT.

Peat-Machines.

No. 143,617. Patented Oct. 14, 1873.

Fig. 3.

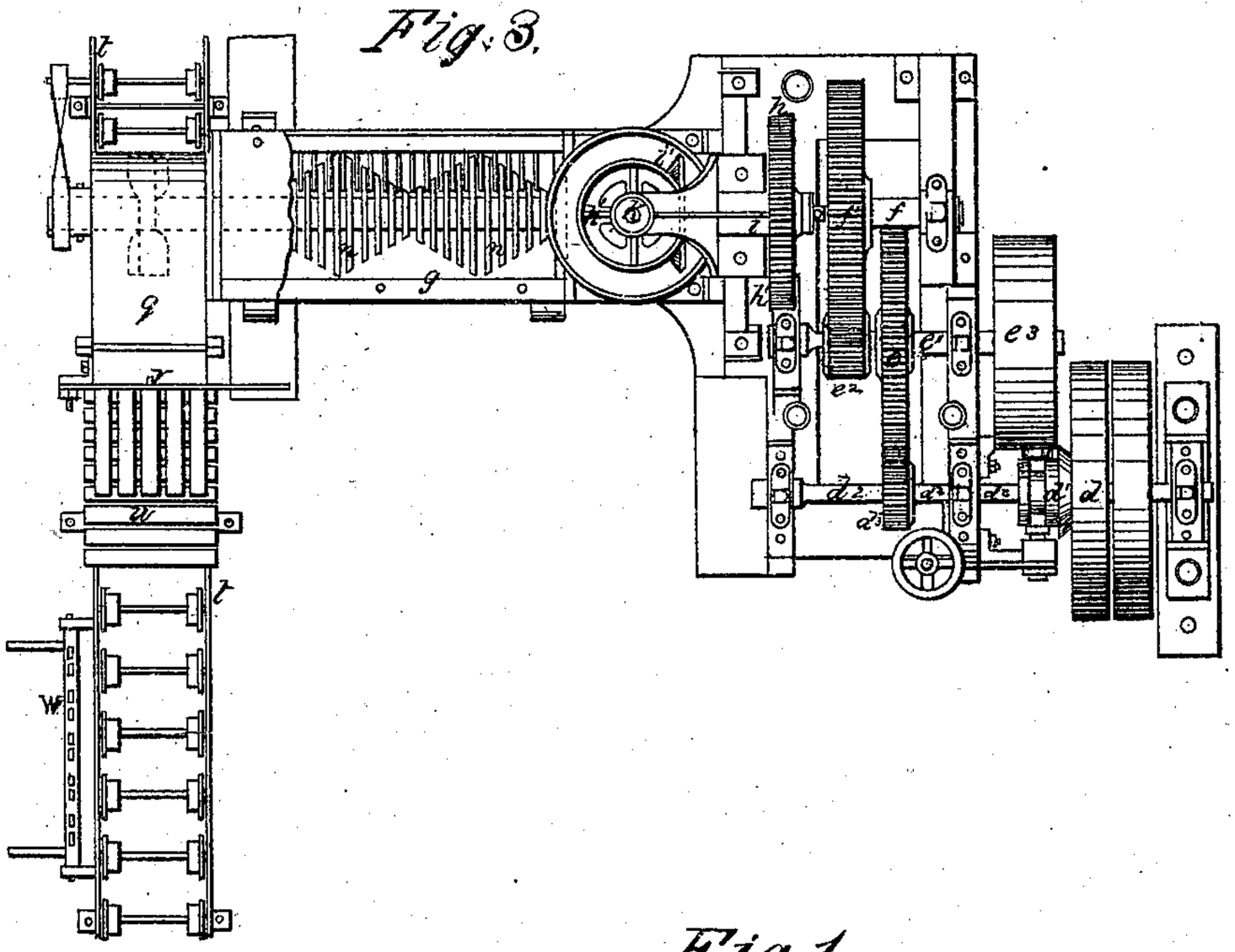
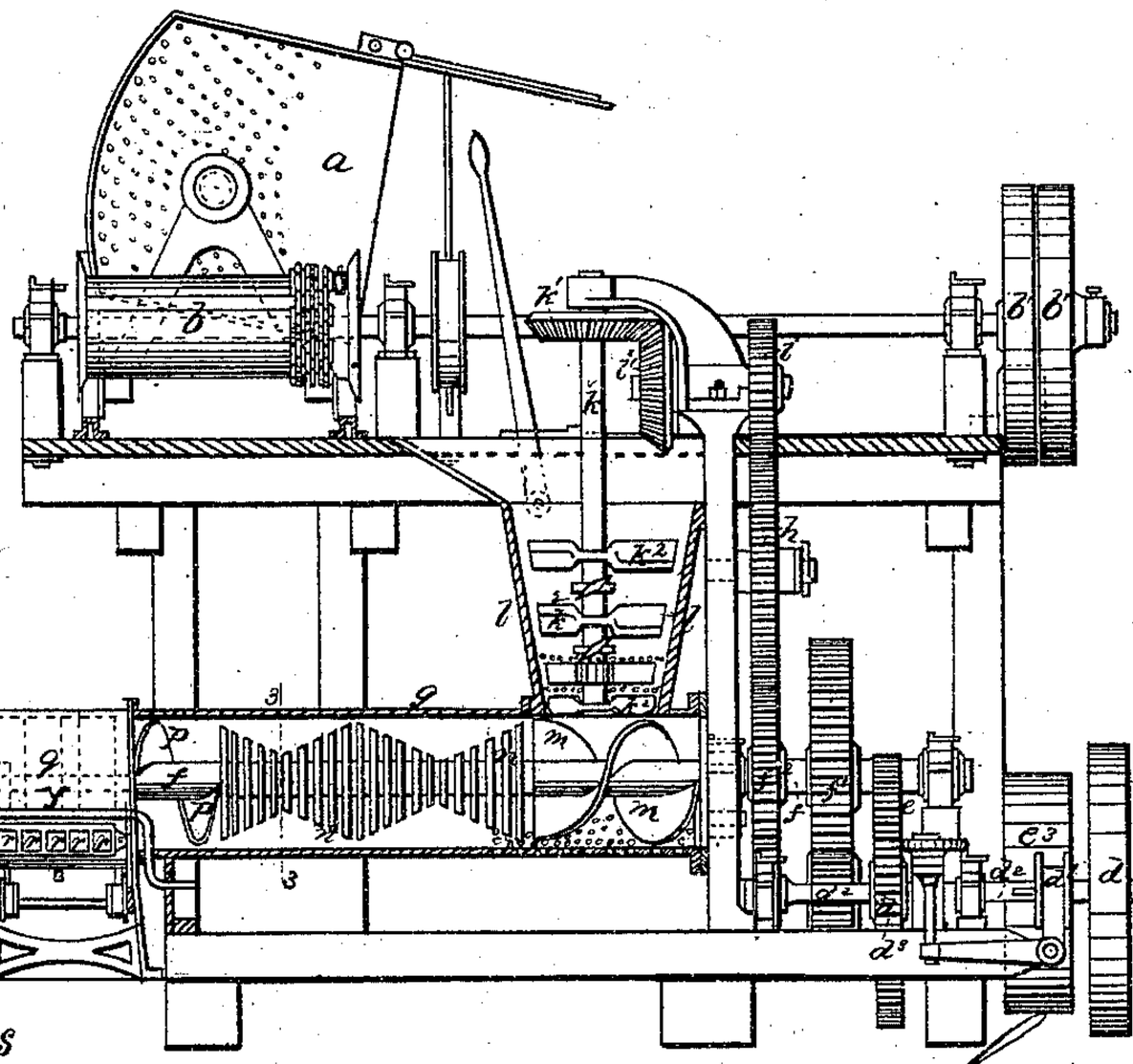


Fig. 1.



Witnesses

C. F. Dunlap

Wellesley M. Ferris

Inventors

Henry Clayton,

Henry Clayton Junr.

Francis Howlett

3 Sheets--Sheet 2.

H. CLAYTON. H. CLAYTON, Jr.. & F. HOWLETT.

Peat-Machines.

No. 143,617. Patented Oct. 14, 1873.

Fig: 2.

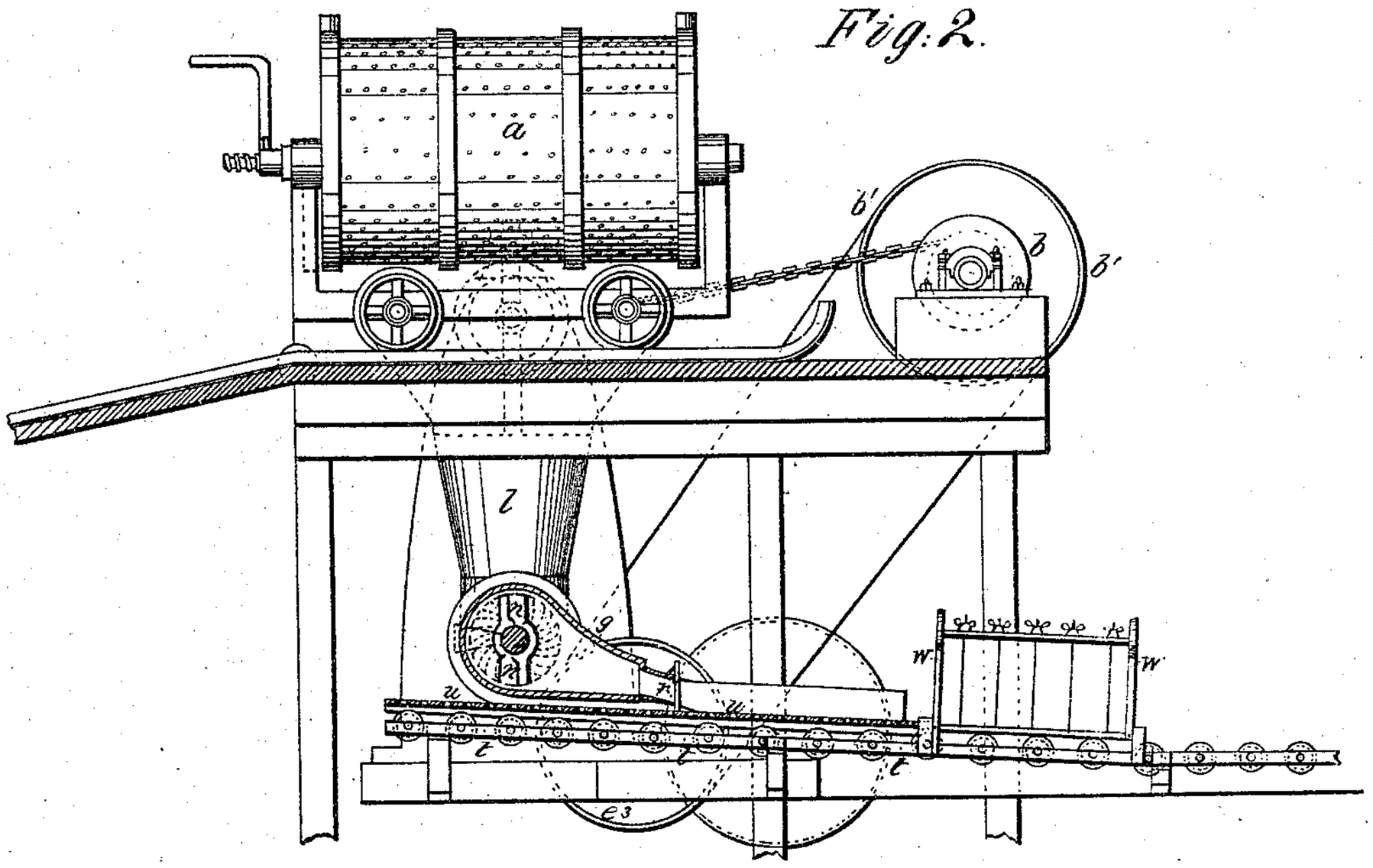


Fig: 10.

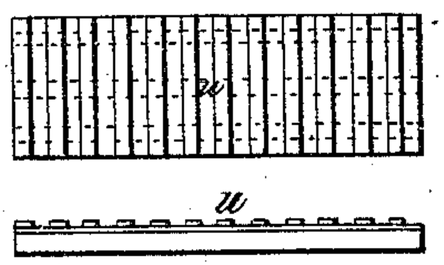


Fig: 9.

Fig: 7.

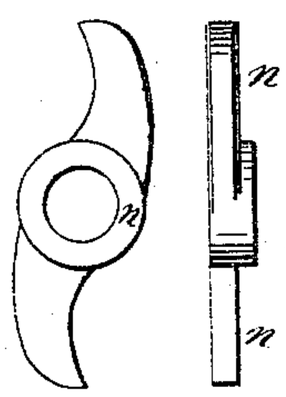
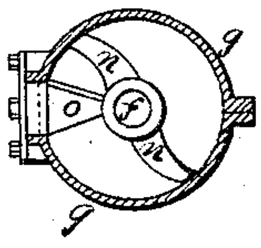


Fig: 8.



Witnesses

C. M. Warren

Wellington Harris

Inventors

Henry Clayton

Henry Clayton Junr

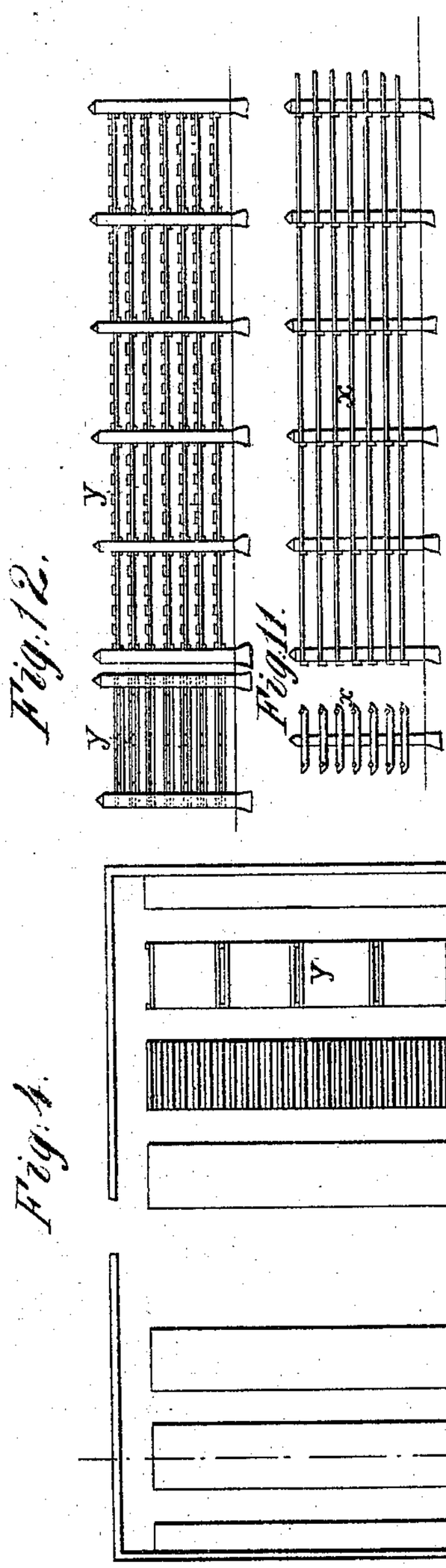
Francis Howlett

3 Sheets--Sheet 3.

H. CLAYTON, H. CLAYTON, Jr., & F. HOWLETT.

Peat-Machines.

No. 143,617. Patented Oct. 14, 1873.



Witnesses

C. Murrey

Henry M. Harris

Inventors

Henry Clayton.

Henry Clayton Jr.

Francis Howlett

UNITED STATES PATENT OFFICE.

HENRY CLAYTON, HENRY CLAYTON, JR., AND FRANCIS HOWLETT, OF LONDON, ENGLAND.

IMPROVEMENT IN PEAT-MACHINES.

Specification forming part of Letters Patent No. **143,617**, dated October 14, 1873; application filed June 17, 1873.

To all whom it may concern:

Be it known that we, HENRY CLAYTON, HENRY CLAYTON, Jr, and FRANCIS HOWLETT, all of the Atlas Works, Woodfield Road, Harrow Road, London, in the county of Middlesex, England, subjects of the Queen of Great Britain, have invented or discovered new and useful Improvements in Treating Peat and in Apparatus employed therein; and we, the said HENRY CLAYTON, HENRY CLAYTON, Jr., and FRANCIS HOWLETT, do hereby declare the nature of the said invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement thereof—that is to say:

This invention has for its object improvements in treating peat and in apparatus employed therein. For this purpose, after the peat has been extracted and conveyed from the peat-bogs, for which latter purpose wagons, such as are hereinafter described, may be conveniently used, it is placed in a vertical hopper, through which it is propelled by inclined blades upon a rotating axis into a horizontal cylinder, through which another axis runs. Beneath the mouth of the hopper there is a screw upon the axis which carries the peat along the cylindrical barrel until it meets a series of radial arms or propellers set spirally upon the axis, and these arms pass between knives fixed within the cylinder and push the peat past the knives. By the action of the knives and propelling arms the peat is cut up into small pieces, and squeezed or kneaded together. By being so treated, the fibers of peat are so divided that facility is given for setting free all moisture and fixed air that may be retained in the cells of the peat-stalks, and the stalks are deprived of elasticity or resiliency, so that the peat is reduced to a state fit for molding.

We are aware that attempts have heretofore been made to compress and mold peat into blocks, but such attempts have, as we believe, been wanting in success, usually because the peat has not been properly cut up, squeezed, and kneaded, as in the apparatus employed by us, as above mentioned and hereinafter more particularly described.

The peat, after being cut up and kneaded, is carried forward by another screw upon the axis and pressed out through a die with one or more molding-orifices at the end of the cylinder, care being taken that the peat is rendered of the proper consistency by the operations of cutting and depriving it of moisture, so as to make it suitable for being molded and cut into blocks. The molded peat is received onto portable trays, which move forward on rollers as the stream of peat issues from the die, care being taken that the trays or boards on which the peat is received shall be able to move at about the same speed as the exuding stream of peat; otherwise the material will be pressed out of shape and distorted. Near the die a cutting-wire is mounted, by which the stream or streams of peat can be divided at convenient distances, and cutting apparatus is provided, as hereinafter described, by which the molded peat is further divided into briquettes or blocks of convenient size. The briquettes or blocks are carried on the trays by rollers along the drying-sheds until the trays are placed by hand on the drying-racks.

In order that our said invention may be most fully understood and readily carried into effect, we will proceed to describe the drawings hereunto annexed.

Figure 1 is a side elevation, Fig. 2 is an end elevation, and Fig. 3 is a plan, all partly in section, of a machine constructed according to our invention for cutting up, kneading, and molding peat. Fig. 4 shows, to a smaller scale, a plan of the plant for treating peat according to our invention. Fig. 5 is a vertical section on the line 1 1 in Fig. 4. Fig. 6 is a vertical section on the line 2 2 in Fig. 4.

When the peat contains much superfluous water it is conveyed to the works in wagons running upon a light railroad, and which are fitted with covers which, when the wagon is full, are secured. The sides and bottom are perforated with small holes, and one side or end of the body of the wagon is movable, and is actuated by a screw. As soon as the wagon is loaded this movable side or end is forced inward by means of the screw, and thus the peat is put under pressure, so as to cause some of the water to drain from it as it travels to the

works. These wagons are marked *a* in the drawings. They are hauled by a chain wound upon a barrel, *b*, onto a platform erected over the cutting-up, kneading, and molding machine. *c* and *c'*, in Fig. 4, represent the engine and boiler by which the machinery is driven. *d* is the belt-pulley of the cutting-up, kneading, and molding machine. By a double-cone friction-clutch, d^1, it is made to drive the axis d^2, on which is a pinion, d^3. The pinion gives motion to the spur-wheel *e* upon the axis e^1. e^2 is a pinion on the axis e^1, driving the wheel f^1 on the shaft *f*, which traverses the cutting-up and kneading cylinder *g*. e^3 is a drum on the axis e^1, and a driving-belt is passed from it to the fast and loose pulleys b^1 on the axis of the winding-drum *b*. f^2 is another spur-wheel upon the shaft *f*, driving through an intermediate wheel, *h*, the wheel *i*, which has upon its axis the beveled wheel i^1, gearing with the wheel k^1, upon the vertical shaft *k*, mounted within the hopper *l* of the cutting-up, kneading, and molding machine.

In the drawings, one of the wagons, *a*, is represented tipping its contents into the hopper *l*. The inclined blades k^2 k^2, upon the shaft *k*, press the lumps of peat downward into the cylinder *g*, where they meet the forcing blades or worm *m* fixed upon the shaft *f*. The hopper *l*, at its lower part, and a portion of the cylinder *g*, are perforated to admit of the escape of any water which may be squeezed out by the pressure. The peat is thus brought within reach of the propelling-arms *n*, one of which is shown to a larger scale by the Figs. 7. These arms, which are fixed spirally upon the shaft *f*, pass between knives *o*, as is clearly seen at Fig. 8, which is a transverse section of the cylinder *g*, and the parts within it, taken on the line 3 3 in Fig. 1. One of the knives, *o*, is shown separately to a larger scale by the Figs. 9. They are made, as is there seen, with dovetail feet, and they are received into corresponding grooves in a bar or plate, which forms part of the barrel *g*, and is secured to the other parts by bolts, as is seen in Fig. 8. *p* is another forcing blade or worm upon the axis *f*, which carries the material, after it has been masticated, into the chamber *q*, from which it escapes by the molding-orifices *r*. The lumps of peat, which are thrown in the hopper *l*, are first reduced in size, to some extent, by the action of the blades k^2; but the cutting up and kneading are mainly effected by the propelling-arms forcing themselves through the peat, and carrying it again and again between the knife-blades, while it is firmly compacted between the feeding-worm *m*, the pitch of which is rapid, and the delivering-worm *p*, which is of comparatively slow pitch.

The feeding-worm, kneading or masticating blades, and delivery-worm, with the cylinder which contains them, constitute a compound compresser and masticator, in which the peat (previously compressed by the rotating arms of the upright hopper) is masticated while it is in the compacted state, resulting from its delivery (by the slow-pitch delivery-worm *p*) being less rapid than its feeding movement by the feeding-worm *m*.

It will be observed that the knives are placed closer and closer together in passing from the feeding to the delivery end of the cylinder, and, to correspond, the propelling-arms are widest at the feeding end. All the propelling-arms are flat on the face, and their spiral arrangement is such that they act efficiently to keep the peat in motion rapidly forward through the machine.

In small machines to be driven by horse-power it may sometimes be convenient to place the cutting-up and kneading cylinder *g* in a vertical, in place of in a horizontal, position.

s is an agitator, to keep the material within the chamber *q* in motion, and cause it to flow more regularly to the molding-orifices *r*. In the drawing five molding-orifices are shown. They are all formed in one die, which is secured by bolts to the mouth of the chamber *q*. Beneath the chamber *q* is a roller-table, *t*, on which the boards or trays *u* to receive the molded peat are placed. Figs. 10 show one of these boards. They have ribs on their faces, in order that the peat lying upon them may dry more rapidly. The boards or trays are placed by a boy, in succession, upon the roller-table *t*, and one of these rollers being driven, as is shown, the boards run on in a continuous series underneath the molding-orifices, and receive the peat issuing from them. As the end of each board comes up the workman severs the streams of molded peat by means of the chopping-wire *v*, and he pushes the board forward until it is opposite the cutting-frame *w*, in which several wires are stretched. The frame *w* turns upon axes at its lower end, and the workman moving the frame by hand brings the wires down onto the peat, and severs each bar resting upon the board or tray into half a dozen pieces, each about six inches long, which is a convenient size for use. The boards or trays, with the briquettes upon them, are caused to travel on along the roller-table until they are opposite the tray-racks *x*. The boards or trays are then lifted off onto the racks, and they remain on these racks for about three days, more or less, according to circumstances, and until the briquettes will bear handling. The briquettes are then placed upon the open shelving *y*, and the boards or trays go back to be refilled. On the average, in about three weeks, the briquettes will be well dried and ready for use. Figs. 11 illustrate the construction of the tray-racks. They consist of uprights with arms fixed upon them, between which iron rods are strained. Figs. 12 illustrate the construction of the shelving, onto which the briquettes are received when they are removed from the boards or trays.

Having thus described the nature of our said invention, and the manner of performing the same, we would have it understood that we claim—

1. The improvement in the art of manufacturing peat, substantially as before described, consisting of the following operations, viz: First, the compression of the peat. Second, the kneading or masticating of the peat while it is compressed or compacted. Third, the compression of the masticated peat into a continuous sheet. Fourth, the division of the said sheet into bricks, the said operations being performed successively in the order in which they are stated.

2. The combination, substantially as before set forth, of the following apparatus, viz: The upright hopper with its propelling-blades, the compound compresser and masticator, the molding-orifices, and the chopping-wire.

3. The combination, substantially as before set forth, of the following apparatus, viz: The compound compresser and masticator, the molding-orifice, and the roller-table with its trays.

4. The combination, substantially as before set forth, of the following apparatus, viz: The compound compresser and masticator, the molding-chamber, the series of molding-orifices, and the agitator in the molding-chamber.

5. The relative arrrangement, substantially as before set forth, of the car-track, the upright hopper, the compound compresser and masticator, the molding-orifices, and the roller-table.

HENRY CLAYTON.
HENRY CLAYTON, JR.
FRANCIS HOWLETT.

Witnesses:
G. F. WARREN,
WILMER M. HARRIS,
Both of No. 17 *Gracechurch street, London.*