(No Model.) 3 Sheets—Sheet 1.

S. O. HOLMES.

PRESS FOR PREPARING BLOCK FUEL.

No. 506,193. Patented Oct. 3, 1893.

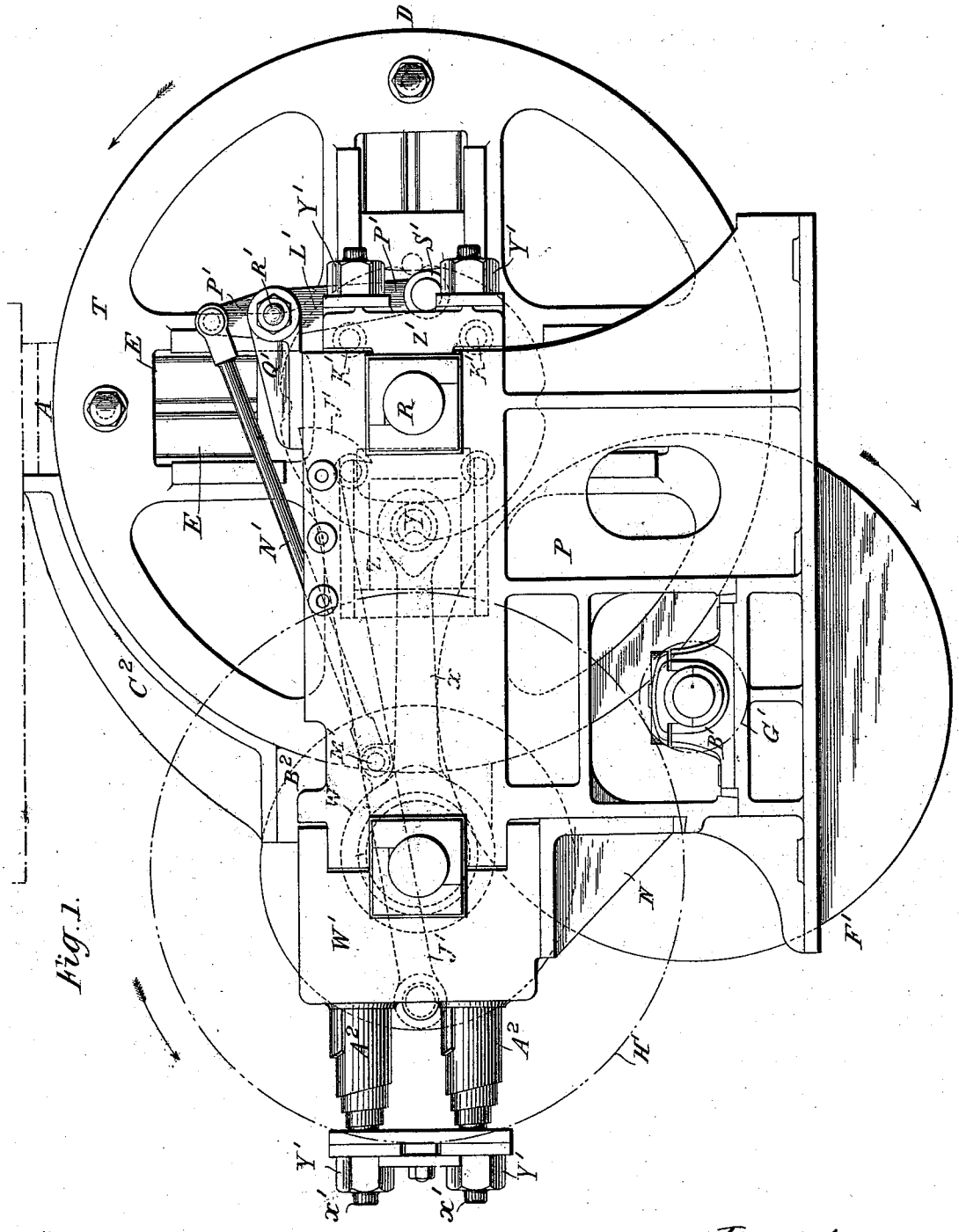

Fig. 1.

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(No Model.) 3 Sheets—Sheet 2.

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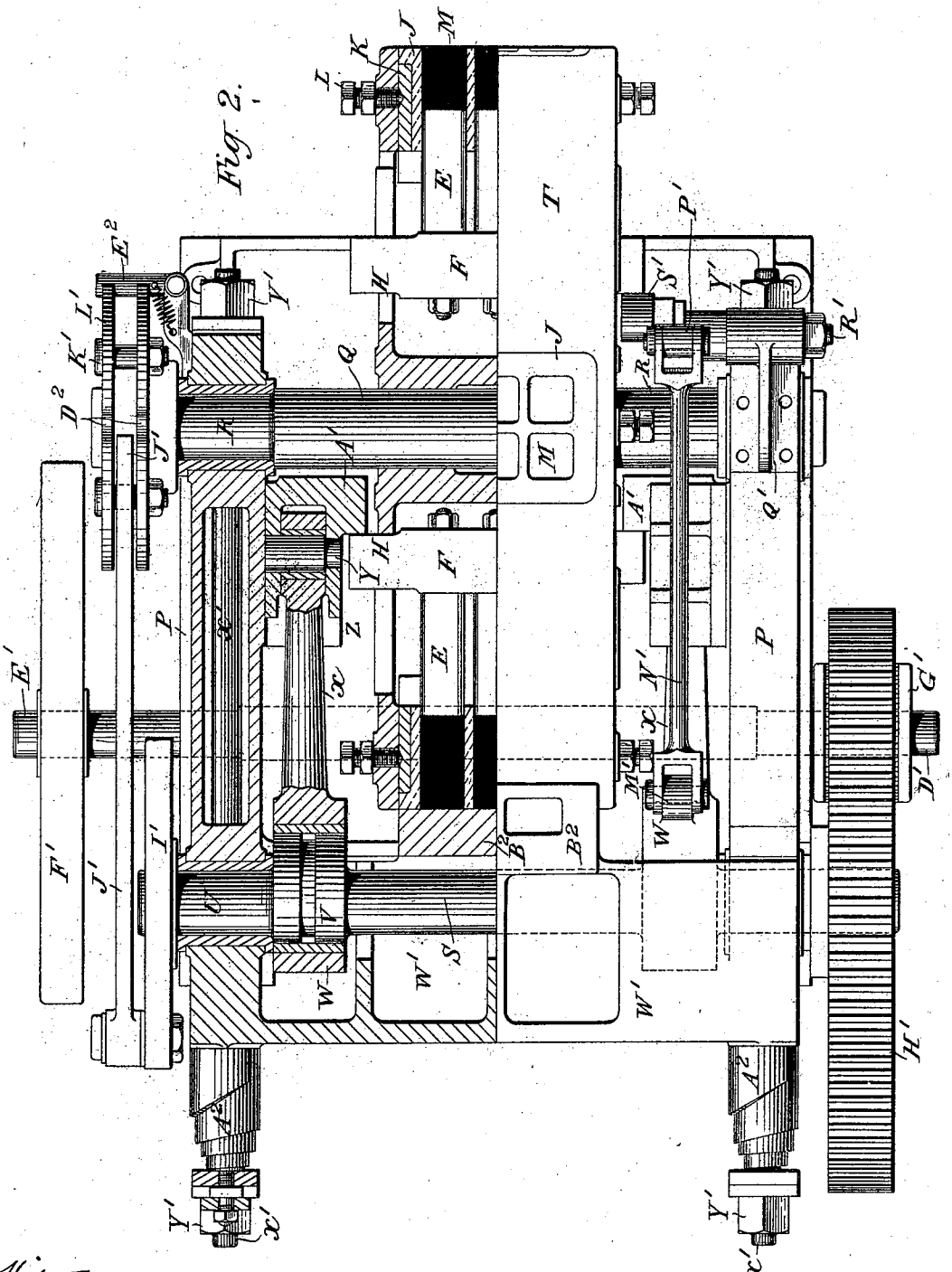
Fig. 2.



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(No Model.) 3 Sheets—Sheet 3.

S. O. HOLMES.

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Fig. 4.

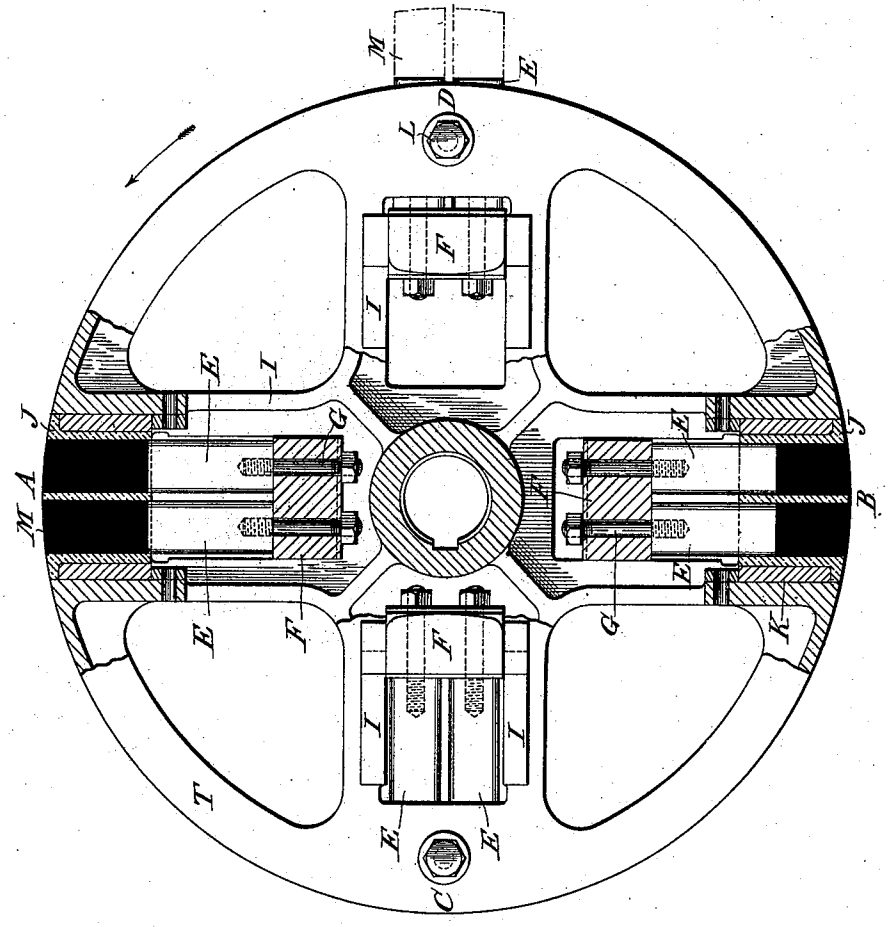
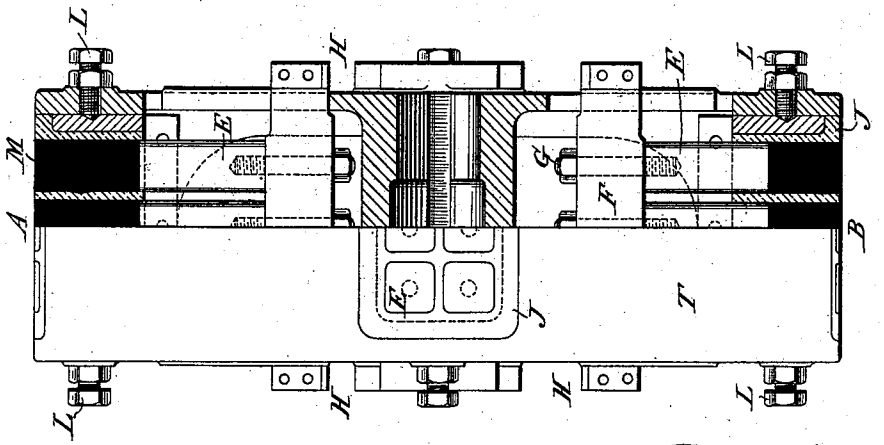


Fig. 3.



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UNITED STATES PATENT OFFICE.

SIMEON O. HOLMES, OF LONDON, ENGLAND.

PRESS FOR PREPARING BLOCK-FUEL.

SPECIFICATION forming part of Letters Patent No. 506,193, dated October 3, 1893.

Application filed May 25, 1892. Serial No. 434,247. (No model.)

To all whom it may concern:

Be it known that I, SIMEON OAKES HOLMES, block-fuel manufacturer, a subject of the Queen of Great Britain, residing at Avon-More, Kew, London, in the county of Surrey, England, have invented new and useful Improvements in Presses for Preparing Block-Fuel and for other Purposes, of which the following is a specification.

This invention relates to the use in the manufacture of block-fuel of presses employed for compressing the materials so as to form suitable blocks. I use a rotary table constructed as hereinafter fully described for carrying the molds and stamps which are thereby brought in turn into position for charging, compressing, and discharging.

In order that my invention may be more fully understood and carried into practice, I will now proceed to describe the same with reference to the accompanying three sheets of drawings, in all the figures of which like reference-letters are employed to distinguish similar parts.

Figure 1 is a side elevation, and Fig. 2 a plan partly in horizontal section, of a press constructed as used by me. Figs. 3 and 4 are detailed drawings of the rotary table to be hereinafter more fully described.

The molds in which the fuel composition is compressed are mounted in groups of any convenient number at the ends A, B, C, D, of a number of tubular equidistant radial arms, which, together with the rim T, constitute the rotary table. Though but four of these equidistant radial arms are shown in the drawings, any number may be employed; and it is advantageous so to arrange them that while two are vertical, two are horizontal. For convenience of manufacture the rotary table is shown made in one casting. It will be readily understood that the molds are supported only by the radial arms of the said table, the rim T being, as already stated, simply for the purpose of closing the orifice in the charging apparatus. If desired the said orifice may be closed by a sliding door or other suitable means, in which case the rim T may be dispensed with, the table then consisting of the radial arms only.

As shown in the drawings, each group A, B, C, D, consists of a single cellular casting J of gun-metal or other suitable material. This casting J is inclosed within a cast-iron or steel socket K which may be "shrunk" upon, or otherwise permanently attached to, the said cellular casting J. It is obvious that each group of molds may consist of one casting, the object of the socket or outer casting K being to take the compressing strain to which the molds are submitted during the operation of compressing each charge, and thereby relieve the table of such strain and allow of its being constructed in a lighter manner. Each group of molds is secured in position in the periphery of the rotary table by means of set screws L as shown, so that it may be readily removed when required. Each cell or mold of each group is provided with a solid stamp, ram, or plunger E made to fit freely within its respective mold. The stamps E are so arranged that their ends never leave the molds, the inner ends of which are thereby always closed. All the stamps E for each group of molds A, B, C, D, are carried by a stout plate or bearer F to which they are secured by bolts G or other suitable means. These plates F are fitted within the hollow arms of the rotary table so that they may slide freely therein and, in so doing, carry the stamps E backward and forward in the molds. The ends H of these plates or bearers F are extended so as to pass through slots in the sides of the arms of the rotary table, against the edges I of which they take their bearing, and project into the path of lugs A′ on the reciprocating slides Z.

The rotary table described is mounted upon, and keyed to, the horizontal shaft Q journaled at R in the bearings of the main casting or frame work P. The shaft Q, and with it the rotary table, is intermittently rotated by means of the pawl J′ actuated by the crank disk I′ on the main shaft S and taking into a ratchet wheel on the said shaft Q. This ratchet wheel consists of two disks L′ held apart from one other by a suitable distance piece and connected by as many equidistant studs or pins K′ as there are arms in the rotary table. The pawl J′ works between the disks L′ and engages in turn with each of the studs K′. The parts are so arranged that the pawl J′ acts to bring each group of molds

A, B, C, D, in turn opposite the stationary pressing block B^2, one of the said groups being brought to this position for each revolution of the main shaft S. The main shaft S is journaled at U in bearings in the frame P and carries, besides the crank disk I′ already referred to, two eccentrics V with their straps W the eccentric rods *x* of which are connected by means of pins Y with the slides, blocks or shoes Z working within guides projecting from the inner sides of the framework P. It will be seen that the rotation of the shaft S, through the eccentrics V imparts a reciprocating motion to the shoes Z. Though I have shown the eccentrics V in the drawings it is obvious that cranks may be employed for the same purpose. As shown at Fig. 2, the shoes Z are placed one on each side of the rotary table with their lugs A′ projecting inward toward the said table so as to engage with the extended ends H of the stamp supporting plates F previously described. The main shaft S receives its motion from the first motion or driving shaft D′, E′, through the spur wheel H′ and pinion G′. The driving shaft D′, E′, is provided with a fly wheel F′. Motion is transmitted to the machine by means of belt, toothed, or other suitable gearing connecting the driving shaft D′, E′, with the motive power.

The caps of both the bearings inclosing the journals U of the main shaft S form parts of the casting W′ carrying the abutment or thrust block B^2 against which the fuel composition is pressed by the stamps E. This casting W′ is held in position against the thrust of the said stamps by the four tie-rods *x*′ which also serve to keep the caps Z′ of the bearings of the shaft Q in position. These tie-rods are provided with nuts Y′ at both ends by means of which the parts may be tightly drawn together. Strong springs A^2 are interposed between the casting W′ and the nuts Y′, so as to allow of the parts yielding slightly in the event of some uncompressible material accidentally gaining access to the molds. The greater part of the weight of the casting W′ is taken by the bracket N upon which its lower face rests.

Pivoted at M′ to each of the eccentric straps W are connecting rods N′, one for each eccentric, which are each connected to a lever P′ pivoted at R′ to the bracket Q′. It will be readily seen that the movement of the eccentrics acting through the rods N′ causes the levers P′ to oscillate upon their pivots R′. The lower ends of the levers P′ carry rollers S′, which, in their outward movement bear against the inner sides of the ends H of the plates F carrying the stamps E and act as pushers to drive them outward to discharge the finished blocks of fuel from the molds. It will be seen that this operation takes place simultaneously with the compressing of the contents of the opposite group of molds to those discharged, the one movement of the eccentrics effecting both operations.

The machine as hereinbefore described is placed immediately below a cooling pan in which arms are rotating horizontally for filling the molds, the operation of filling being effected in the well known manner as will be understood by those experienced in machinery of the kind in question. The pan is close to the pug mill in which the composition from which the block-fuel is made is kept mixed. The opening by which the composition is discharged from the said pan is in immediate contact with the rim T of the rotating table. It will be readily seen that this rim T prevents the composition leaving the pan by acting as a sliding shutter to the said opening. In Fig. 1 the lower portion of a pan is indicated by dotted lines over the upper part of the rotating table. A curved guard or shield C^2 extends from the outlet of the pan to the thrust block B^2 and serves to prevent the escape of the full composition from the molds in their passage from the charging to the compressing point.

In use, one of the group of molds is brought beneath the outlet of the pan as shown at A Fig. 1, and the composition caused to enter the molds. Motion is then communicated to the machine and with the last half of the first revolution of the main shaft S, the rotary table is turned through a quarter of a revolution (when as shown in the drawings it has four arms) by means of the pawl J′. The table then remains still while the main shaft makes another half revolution during which the molds carried by the next arm of the table are being filled from the pan at A, and at the same time, the eccentrics V are acting to compress the contents of the first group of molds and to discharge the finished blocks M from the molds at D which are diametrically opposite to those being compressed in the manner already fully described. With the next half rotation of the main shaft S the rotary table is given another quarter of a revolution which brings those molds last discharged into position for charging (the stamps E at the same time falling back of their own weight) those last charged into position for compressing and those the contents of which were last compressed into their lowest position. With the next half revolution of the shaft S charging, compressing, and discharging, is effected as before described. The rotary table is then again shifted so as to bring the compressed molds into position for discharging and others to the charging, compressing, and lowermost positions as before described. These operations are repeated in regular order while the machine is in motion.

The table may when necessary be held at the right point for each compressing operation by providing the rims of the ratchet disks L′ with a number of shallow indents D^2 into which a spring latch E^2 drops as the said indents are brought before it, so as to prevent the further rotation of the table. The said indents have flaring mouths so that the latch

is driven out from them on motion being again given to the table.

Though I have described the construction of the press with the rotating table carried upon a horizontal shaft and rotating in a vertical plane it is obvious that the table may be operated in a horizontal or inclined position, the filling or feeding mechanism being adapted to the given position as will be well understood. It will also be understood that the points of charging and compressing may be arranged at any suitable relative position to one another and not necessarily at right angles. For instance, they may be placed at any angle with one another or directly opposite each other in a line. It will also be readily seen that the general arrangement and construction of the various parts of the press other than the rotating table may be varied without departing from my invention.

What I claim is—

1. In a machine for pressing materials, the revoluble body having a plurality of radiating arms carrying cellular molds J, and the strengthening sockets K surrounding the said molds and means for compressing the material which is fed to the said molds, substantially as described.

2. In a machine for pressing materials, the combination of a revoluble body having a plurality of molds, means for imparting a step by step movement to the mold body, the stamps or plungers working in the molds, a stationary abutment or block past which the molds are moved, means for moving the stamps toward the said abutment when the molds are opposite thereto in order to compress the material therein, and means for moving the stamps to eject the pressed material from the molds, substantially as described.

3. In a machine for pressing materials, the combination of a revoluble body having the molds into which the material is fed, means for turning the body with an intermittent movement, the stamps or plungers working in the molds, an abutment or block past which the molds are moved, springs against which the said abutment is held, means for moving the said stamps toward the abutment when the molds arrive opposite thereto in order to compress the material therein, and means for ejecting the compressed material, substantially as described.

4. In a pressing machine, the combination of a series of revolving molds, the stamps or plungers mounted therein and carried by the laterally projecting blocks F, a slide which engages with the said blocks to move the stamps to compress the material in the molds, and means for engaging with the said blocks to move them to cause them to discharge the pressed material from the molds, substantially as described.

5. In a pressing machine, the combination of a revoluble body carrying a series of molds into which the material is fed, the stamps or plungers mounted in the molds, an abutment or block close past which the open ends of the molds are moved, means for imparting an intermittent movement to the said mold body, a slide which moves the stamps in succession toward the said abutment to compress the material, and a pusher, which moves the stamps in succession after they have passed the abutment to eject the pressed material, substantially as described.

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