

No. 742,574.

PATENTED OCT. 27, 1903.

C. W. BOYLE.

MACHINE FOR MAKING SAND OR CHEMICAL BRICK.

APPLICATION FILED JULY 31, 1903.

NO MODEL.

4 SHEETS—SHEET 1.

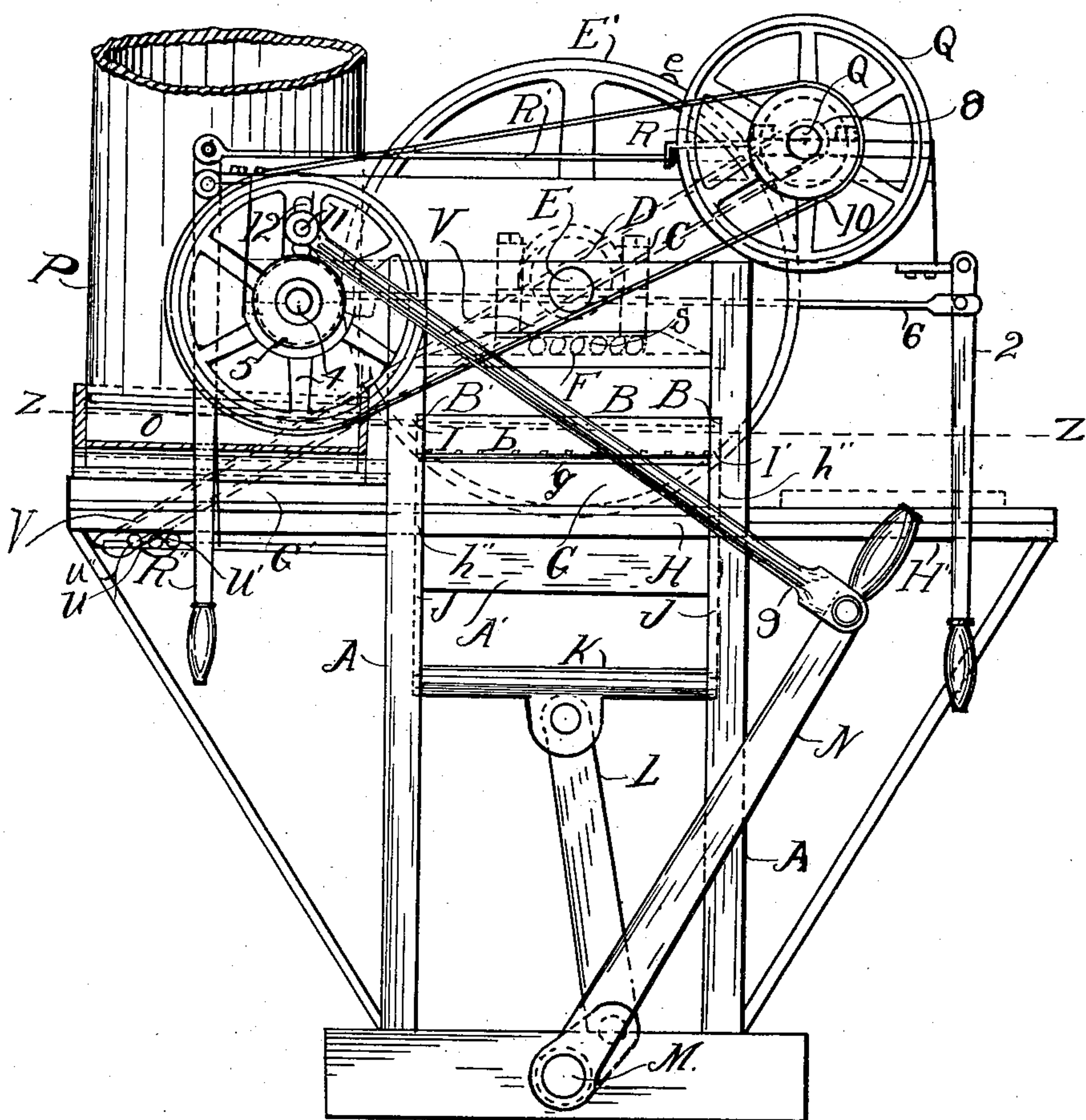


Fig. 1.

Witnesses

Edward R. Monroe.

Mary S. Tooker

Inventor

Charles W. Boyle

By Edward Taggart

His - Attorney

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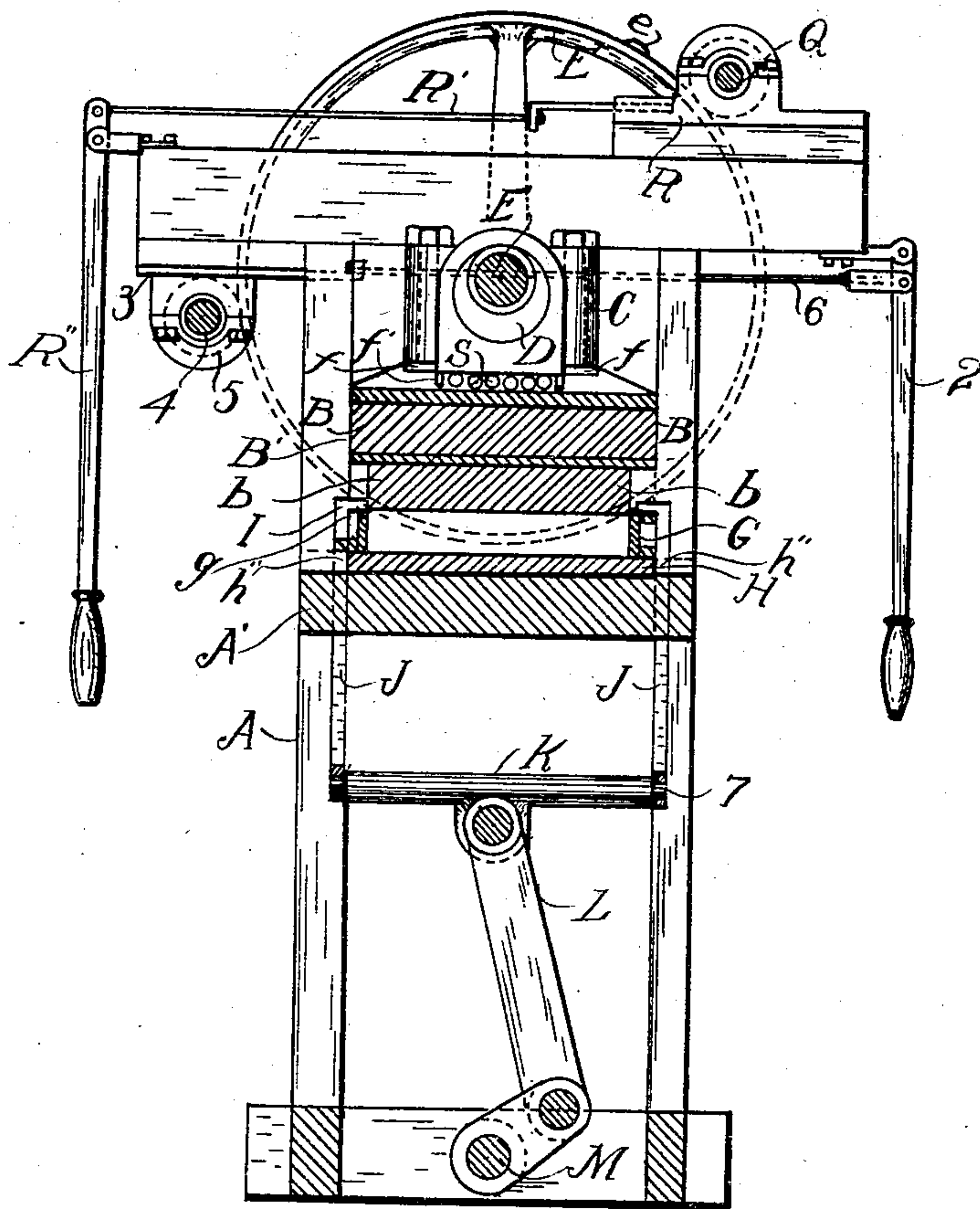


Fig. 2.

Witnesses

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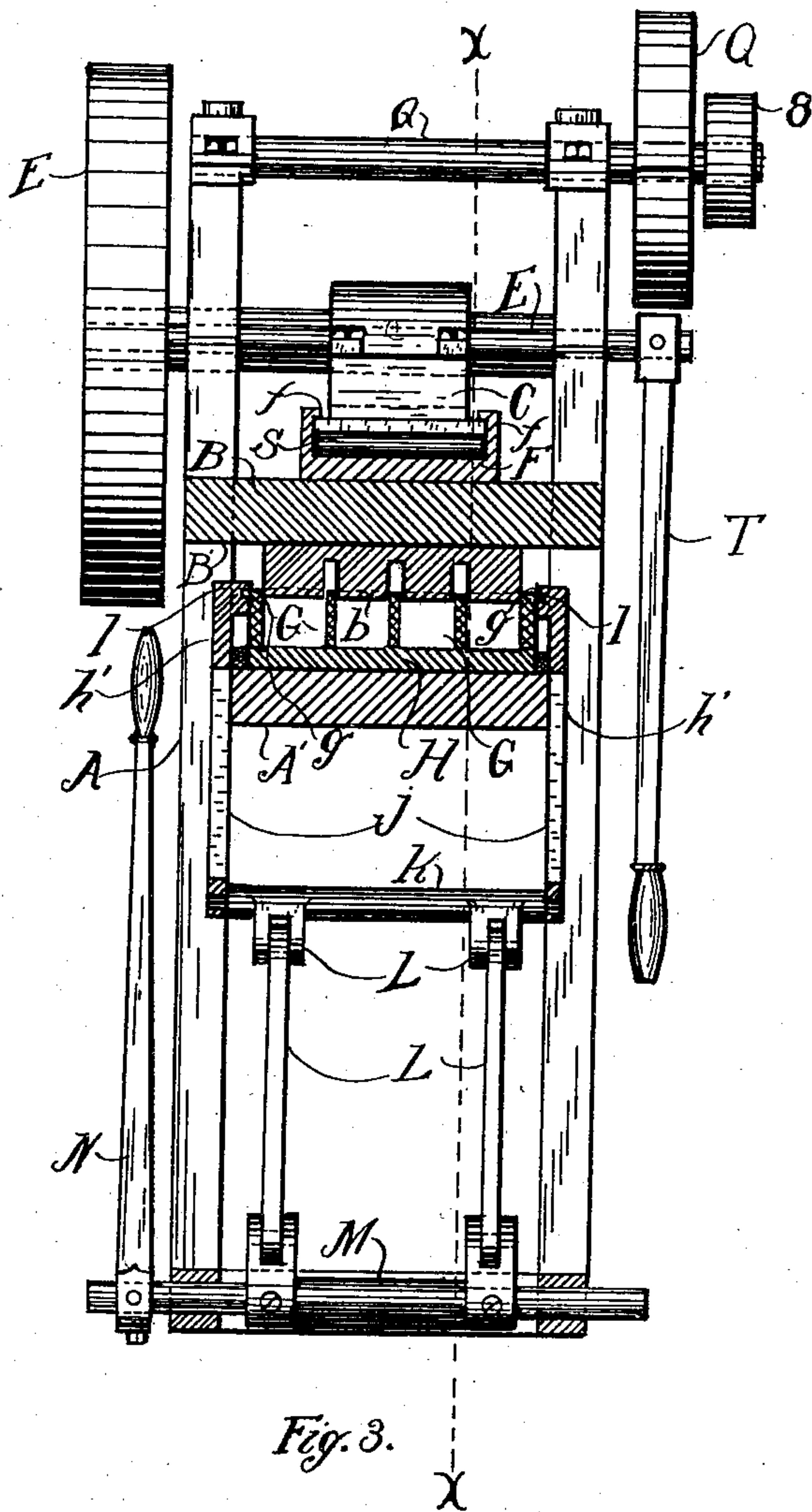


Fig. 3.

Witnesses

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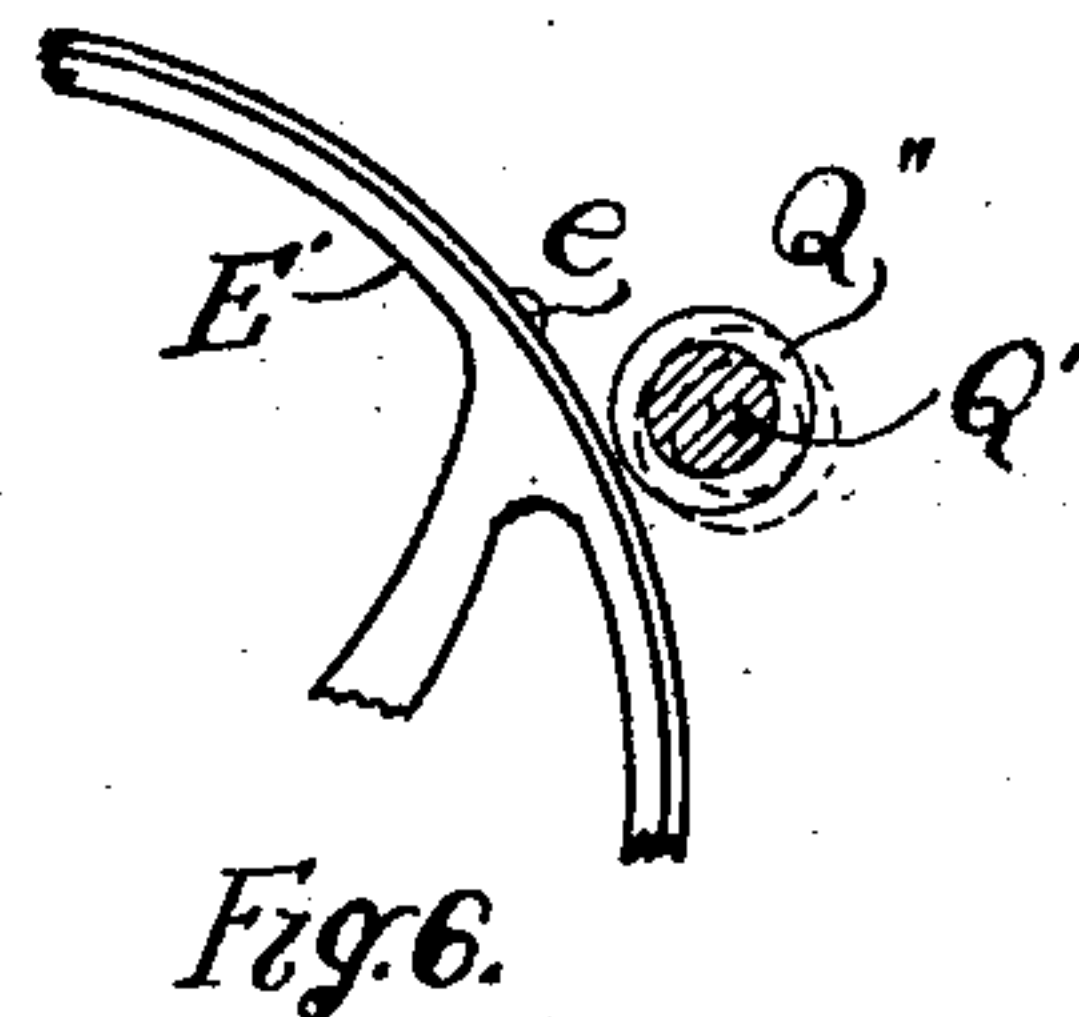
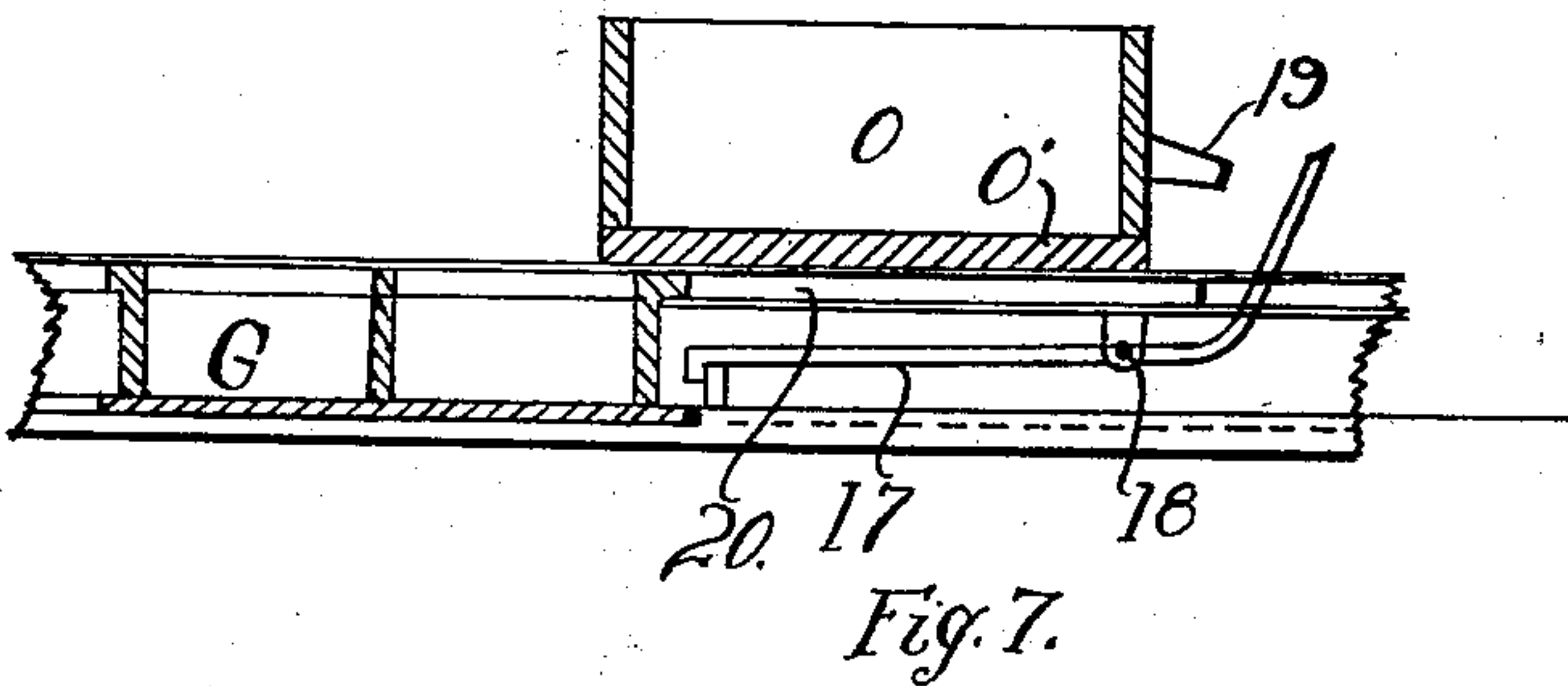
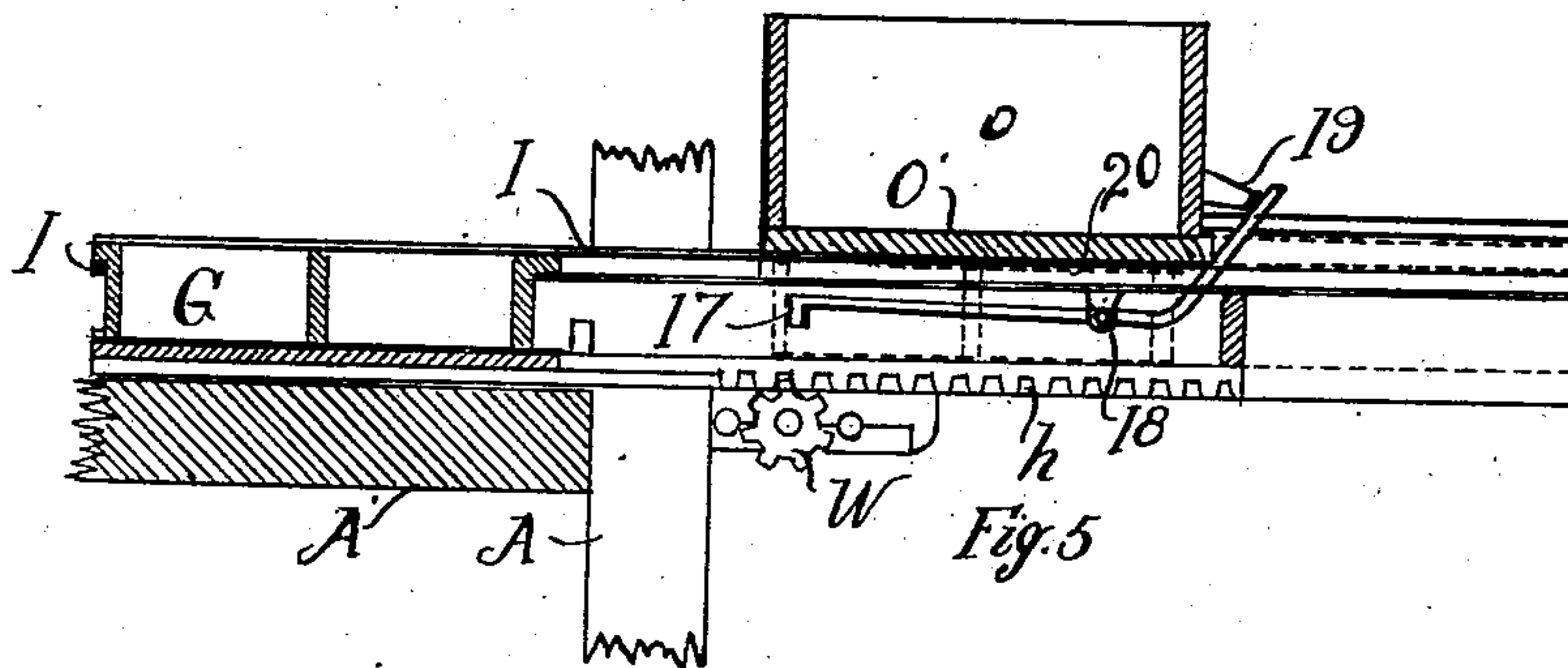
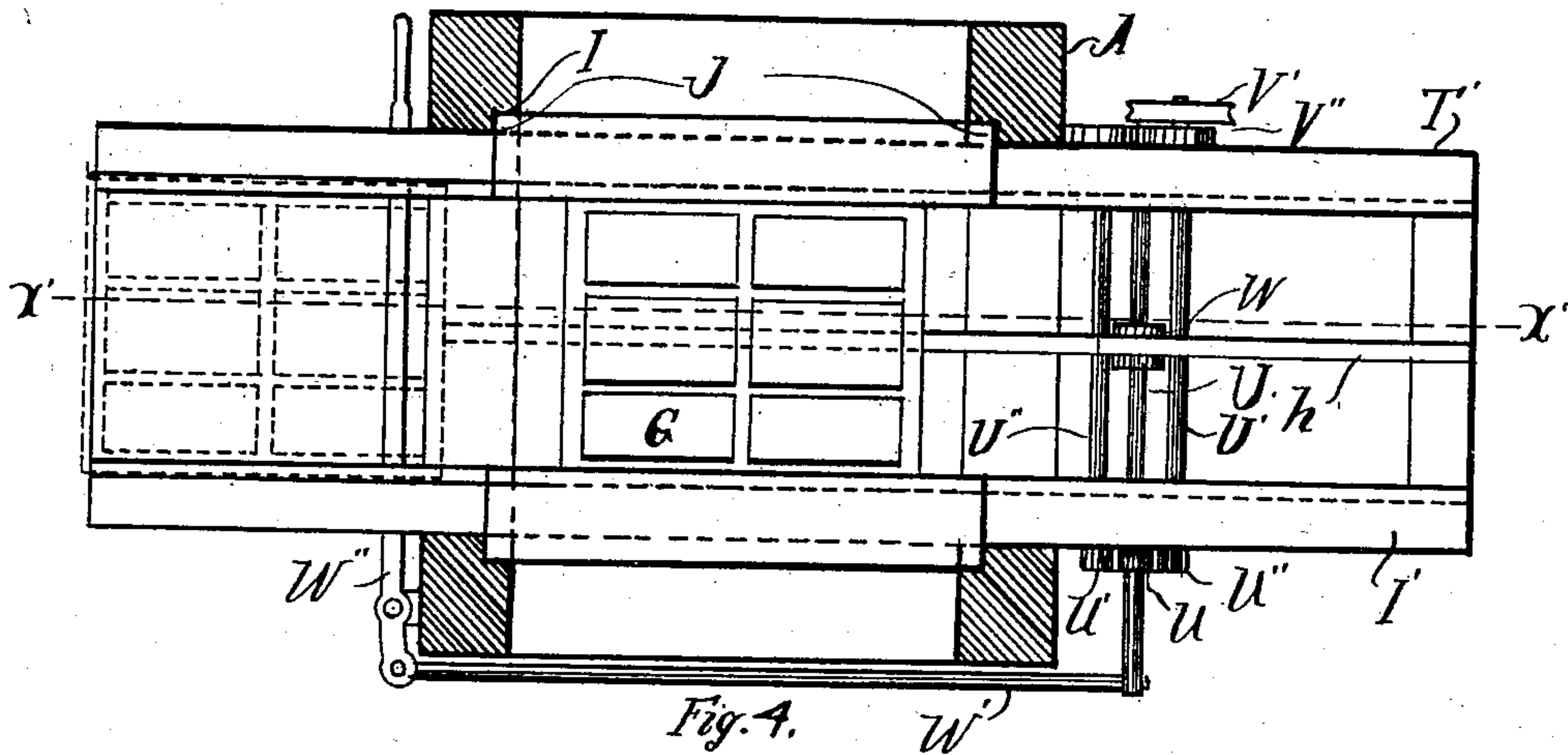
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4 SHEETS—SHEET 4.



WITNESSES:

Edward R. Monroe.

Mary S. Tooker

INVENTOR

Charles W. Boyle

BY Edward Jaggart

His Attorney

UNITED STATES PATENT OFFICE.

CHARLES W. BOYLE, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO GEORGE O. COLE, OF GRAND RAPIDS, MICHIGAN.

MACHINE FOR MAKING SAND OR CHEMICAL BRICK.

SPECIFICATION forming part of Letters Patent No. 742,574, dated October 27, 1903.

Application filed July 31, 1903. Serial No. 167,744. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. BOYLE, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented new and useful Improvements in Machines for Making Sand or Chemical Brick, of which the following is a specification.

This invention relates to certain new and useful improvements in machines for making sand or chemical brick and analogous purposes.

The objects of the invention are, first, to provide suitable means for raising the molds from over the brick in such a manner that the brick may be removed from the machine without interference with the molds; second, to provide a machine of the class described that will mold brick to sharp square corners without breaking the same; third, to provide a means whereby the eccentric that actuates the press-block will, with the bow, be connected directly with the press-block, thereby enabling me to dispense with a connecting-rod; fourth, to provide a brick-machine that may be readily and quickly adjusted to the work of pressing brick or tile of different sizes, thicknesses, forms, or configurations; fifth, to provide a brick-machine having a reliable uniform feed for the material to the molds; sixth, to provide suitable mechanism whereby the bricks or other objects formed in the molds can be readily and quickly removed without breakage. These objects I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of a machine constructed in accordance with my invention, showing the relative position of the several parts which operate to produce the brick. Fig. 2 shows a sectional elevation of the same on the line xx of Fig. 3. Fig. 3 is a sectional elevation on the line yy of Fig. 2. Fig. 4 is a sectional plan of the same on the line zz of Fig. 1. Fig. 5 is a sectional view of the mold and the feed-box and the ways upon which the molds and mold-board are operated on the line $x'x'$ of Fig. 4. Fig. 6 is a sectional view of the driving-wheel mechanism, showing the projecting point for moving the

friction-wheel at the proper time. Fig. 7 is a vertical sectional view of the feed-box and brick-molds, on an enlarged scale, showing the relation of the feed-box to the mold.

Similar letters refer to similar parts throughout the several views.

A represents the supporting-frame of the machine.

A' is the bed that supports the mold and mold-board for pressing the brick.

B is the press-block, which is supported in its ways or slides B' so as to reciprocate vertically, and this press-block is actuated by means of the eccentric D, which is mounted upon the shaft E, and the eccentric bow or head C, which is connected directly with the press-block B by means of the lugs c and f , so that the head slides laterally across the block concurrent with its vertical reciprocations, thus preventing the necessity of a connecting-rod between the eccentric bow and the press-block. Inasmuch as the weight of the press-block is not great and its upward motion may be assisted by the lever N and the knuckle-joint L, I do not deem it necessary to place any antifriction-rollers between the bearings c and f ; but the downward pressure on the press-block being several tons it is necessary to provide suitable means to reduce the friction to a minimum, and for this purpose I place a series of small rollers S in position to receive and evenly distribute the pressure and to allow the head or bow to move laterally with the least possible friction. As it is necessary to have a smooth hard surface for the rollers to travel upon, I provide a detachable plate F, preferably fitted with side guards to prevent the rollers from sliding out endwise and with the bearings f at the upper ends of the side guards to engage with the bearings c on the eccentric bow. To prevent the rollers from rolling out of the bearings, I provide stops f' at each end of the bow, leaving sufficient space between them to allow the rollers room to work freely and without interfering with each other or with the stops.

The eccentric D is caused to revolve with the shaft E, which may be made to revolve by a lever T, or the lever may be removed, as shown in Fig. 1, and the eccentric be driven

by power by the action of the friction-wheel Q'' upon the periphery of the wheel E', as shown in Fig. 6. The friction-wheel Q'' is driven by the shaft Q' by any ordinary device for transmitting power, as by a belt over the pulley Q, and is drawn against the periphery of the wheel E' by means of the lever R'' through the medium of the rod R' acting upon the sliding box or bearing R and is pressed away from the wheel at the proper time by the projecting knob *e* on the wheel E'. This projection is located on the wheel E', so that it will throw the friction-wheel off just after the eccentric has passed the lowest point and started upon its upward motion sufficiently to slightly relieve the pressure upon the brick, where it should stand a moment to give the brick an opportunity to assume its proper form and shape and become sufficiently set to retain its form, when the press-block may be raised by properly manipulating the lever R', as hereinbefore described.

The lower portion *b* of the press-block is preferably made detachable, so that various forms, shapes, depths, and patterns of mold may be applied as it is desired to vary the form, size, thickness, or configuration of the tile or brick to be manufactured.

The molds may be made of any desired form, and the portion *b* of the press-block must be made to exactly fit them, as indicated in Figs. 2 and 3, and they are filled by passing them out under the feed-box O, (see Fig. 1,) which is kept properly filled with the proper material from which the brick or tile are to be made by passing it in proper quantities through the tube P.

The mold G is supported by placing the projecting flange *g* into the groove *i* in the ways or tracks I, which latter are supported by means of the bolts J, the lower ends of which are secured in the yoke K, to which the knuckle-joint or compound lever L is attached and so arranged that the turning of the lever M with the lever N will raise and lower the mold, as desired.

In order to operate the lever-joint L M by machinery, I connect the lever N to the pulley 4 by means of the connecting pivoted arm 9. The pivoted arm 9 is provided with a pivot 11, which passes through at the slot 12 in the spoke or extension of the pulley 4. 5 is a friction-pulley on the hub of the pulley 4. This pulley 4 engages with the friction-wheel E' to operate the lever N and is operated by means of the belt 10, which passes over the pulley on the shaft Q'.

The lever 2 is pivoted to the frame and is connected, by means of a connecting-rod 6, to the journal-box of the pulley 4, which journal-box has a laterally-sliding motion, and by operating the lever 2 the belt 10 may be slackened, so as not to operate the operating-pulley 4, and by tightening the belt 10 by means of said lever the operating-pulley 4 is set in motion, operating the lever N and the

joint L M for the purpose of raising and lowering the mold.

To fill the mold, the same, together with the mold-board, is carried out on the track H' under the feed-box O. In passing out the end of the mold engages the hook 17 and carries the sliding bottom O', back with it so that when the mold is in position, as indicated in dotted lines in Fig. 5, it will be filled with the filling material, and upon its return it will draw the sliding bottom with it until the hook reaches the incline. At the end of the slot or guide 20, I provide a projection 19, which contacts with the incline of the hook. The hook 17 is pivoted at the point 18.

The mold and the mold-board are manipulated by means of the rack *h* and the gear-wheel W, as follows: The belt V passes around the shaft Q' and the pulley V' on the shaft U' and revolves this shaft upon the shaft Q', and this shaft in turn imparts motion to the shaft of U' through the medium of the gear-wheels U'' in the opposite direction from the shaft U'. These shafts are provided at the opposite end with friction-pulleys *u'* in position to engage alternately with the pulley *u* on the shaft U. This shaft carries the gear-wheel W, which meshes with the rack *h*. The end of the shaft U is actuated by means of the lever W'' and the connecting-rod W', so that the friction-pulley *u* may be made to engage one or the other of the friction-pulleys *u'* on the shaft U' or U'' to draw the mold and mold-board under the feed-box or to carry it back under the press-block or the mold-board and brick to the tracks H'', as indicated by the dotted lines in Figs. 1 and 4.

The grooved tracks or supports I are continued under the box O by corresponding tracks I', so that the mold is always supported by the flange *g* at its upper edge as well as upon the mold-board. The mold-board is held in position laterally by the guides *h'* and is drawn by the rack *h* by means of the upwardly-projecting lugs *h''*.

Having thus described my invention, what I claim to have invented, and desire to secure by Letters Patent, is—

1. The combination with a supporting-frame, a press-block provided with inwardly-projecting bearings, an eccentric, an eccentric bow or head provided with ways corresponding to the bearings in the block, and antifrictional rollers between the bow and the block.

2. In a brick-machine a supporting-frame, a vertically-reciprocating block, an actuating-eccentric connected therewith, a mold, mold-board and supports beneath said block, a rack and arm connected with the said mold-board, a gear-wheel connected with said rack, and tracks extending each way from the support.

3. In a brick-machine a supporting-frame, a vertically-reciprocating press-block, an actuating-eccentric and bow connected therewith, antifriction-rollers between the bow and the block, a mold beneath the block, a verti-

cally-reciprocating support connecting with the mold, and a knuckle-joint and lever connected with said support.

4. In combination with the supporting-
5 frame a vertically-reciprocating block, an actuating-eccentric and bow connected vertically, a mold beneath the said block, an independent mold-board, a track and rack, a gear-wheel connected with said board, a sand-
10 box, a sliding bottom to said box, a catch on the said bottom in position to engage the mold when passing thereunder and an actuating-lever.

5. In combination, a supporting-frame, a
15 vertically-reciprocating press-block, an actuating-eccentric and bow connected therewith, a driving-wheel a friction-wheel to act thereon, and a projection on the driving-wheel in position to act on the friction-wheel
20 and actuating-levers.

6. In a brick-machine a supporting-frame, a press-block, an actuating-eccentric and bow connected therewith, a mold having a flange, a support having grooves corresponding with said flange, a vertically-reciprocating knuc- 25
kle-joint carrying said supports, and a lever for actuating the same, substantially as described.

7. In a brick-machine a supporting-frame a press-block, an actuating-eccentric, a mold, 30
a vertically-reciprocating knuckle-joint, a mold-board and suitable means for actuating the said mold-board.

In testimony whereof I have hereunto set my hand in presence of two subscribing wit- 35
nesses.

CHARLES W. BOYLE.

Witnesses:

EDWARD TAGGART,
MARY S. TOOKER.