(No Model.)

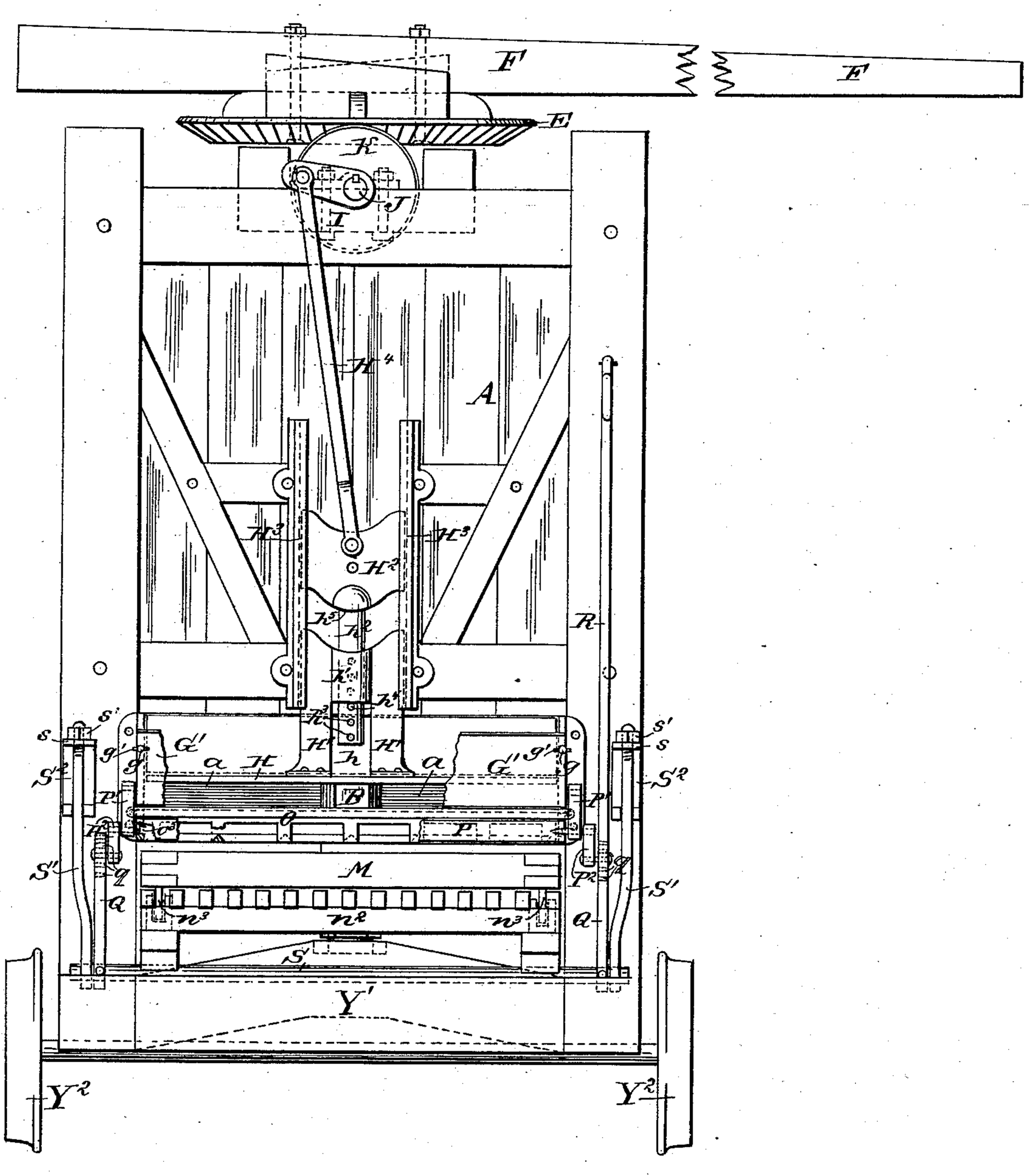
4 Sheets—Sheet 1.

A. J. MILLER.

BRICK MACHINE.

No. 314,340. Patented Mar. 24, 1885.

Fig. 1.



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ATTORNEYS.

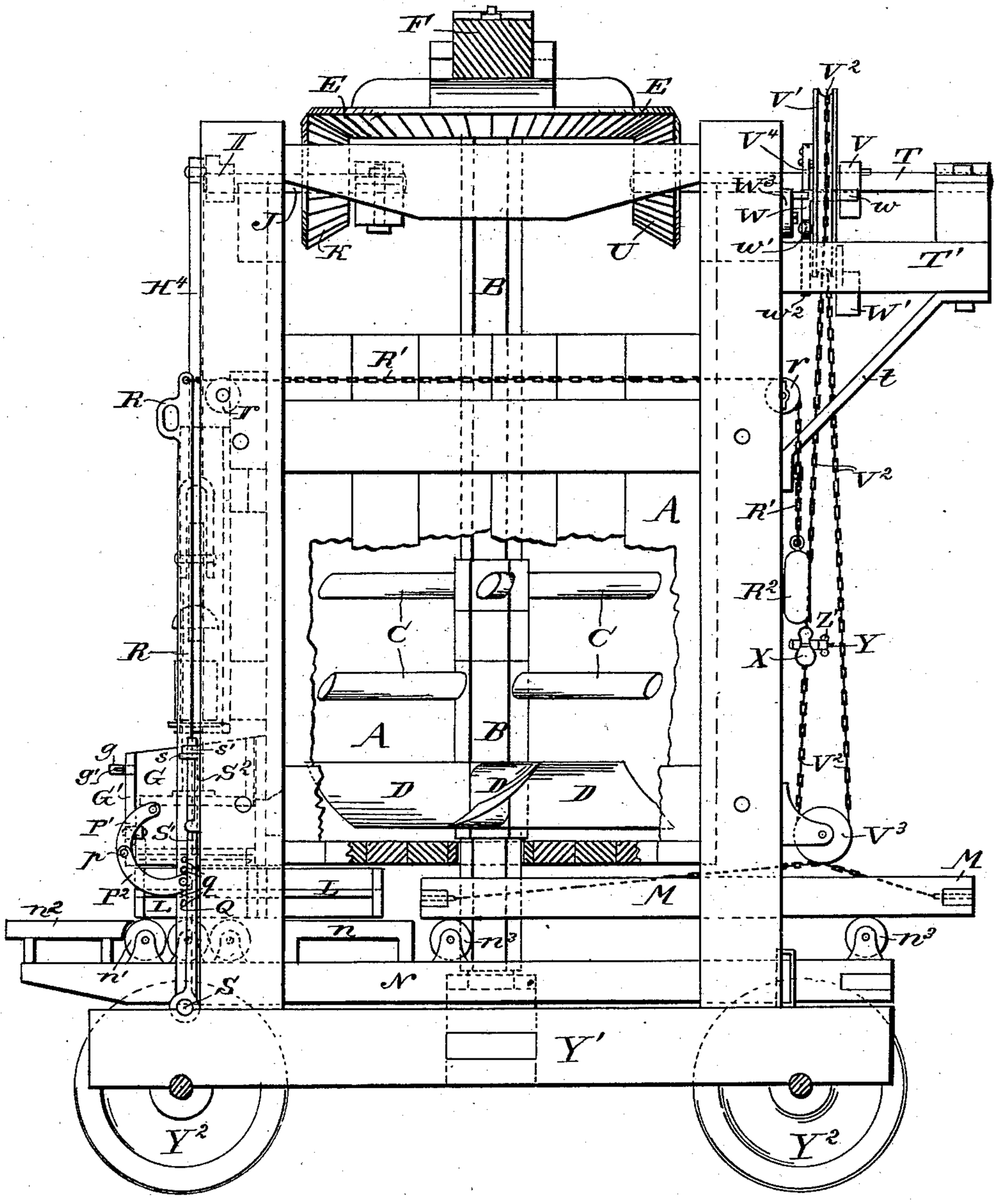
(No Model.) 4 Sheets—Sheet 2.

A. J. MILLER.

BRICK MACHINE.

No. 314,340. Patented Mar. 24, 1885.

Fig. 2.



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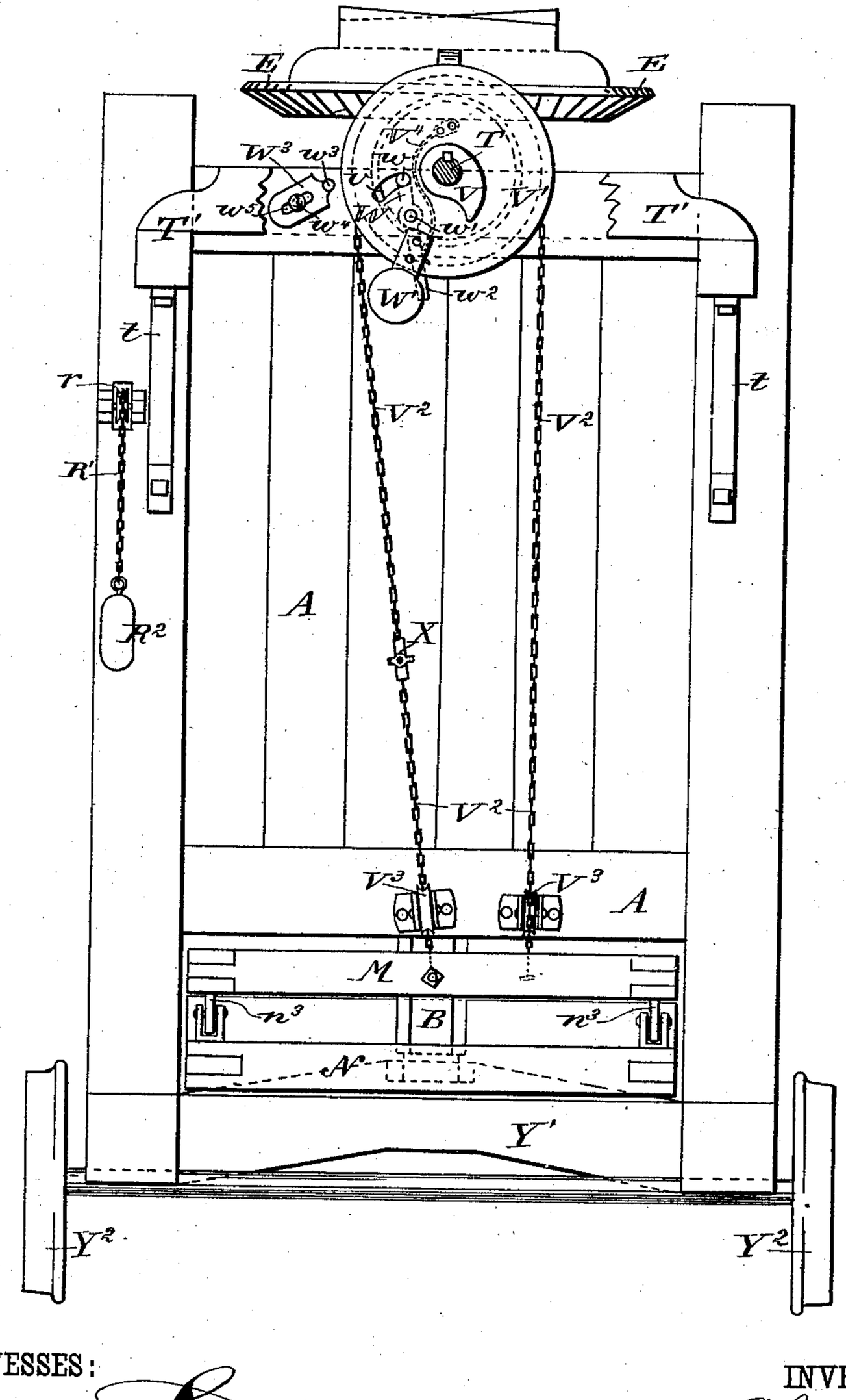
(No Model.) 4 Sheets—Sheet 3.

A. J. MILLER.

BRICK MACHINE.

No. 314,340. Patented Mar. 24, 1885.

Fig. 3.



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4 Sheets—Sheet 4.

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BRICK MACHINE.

No. 314,340. Patented Mar. 24, 1885.

Fig. 4.

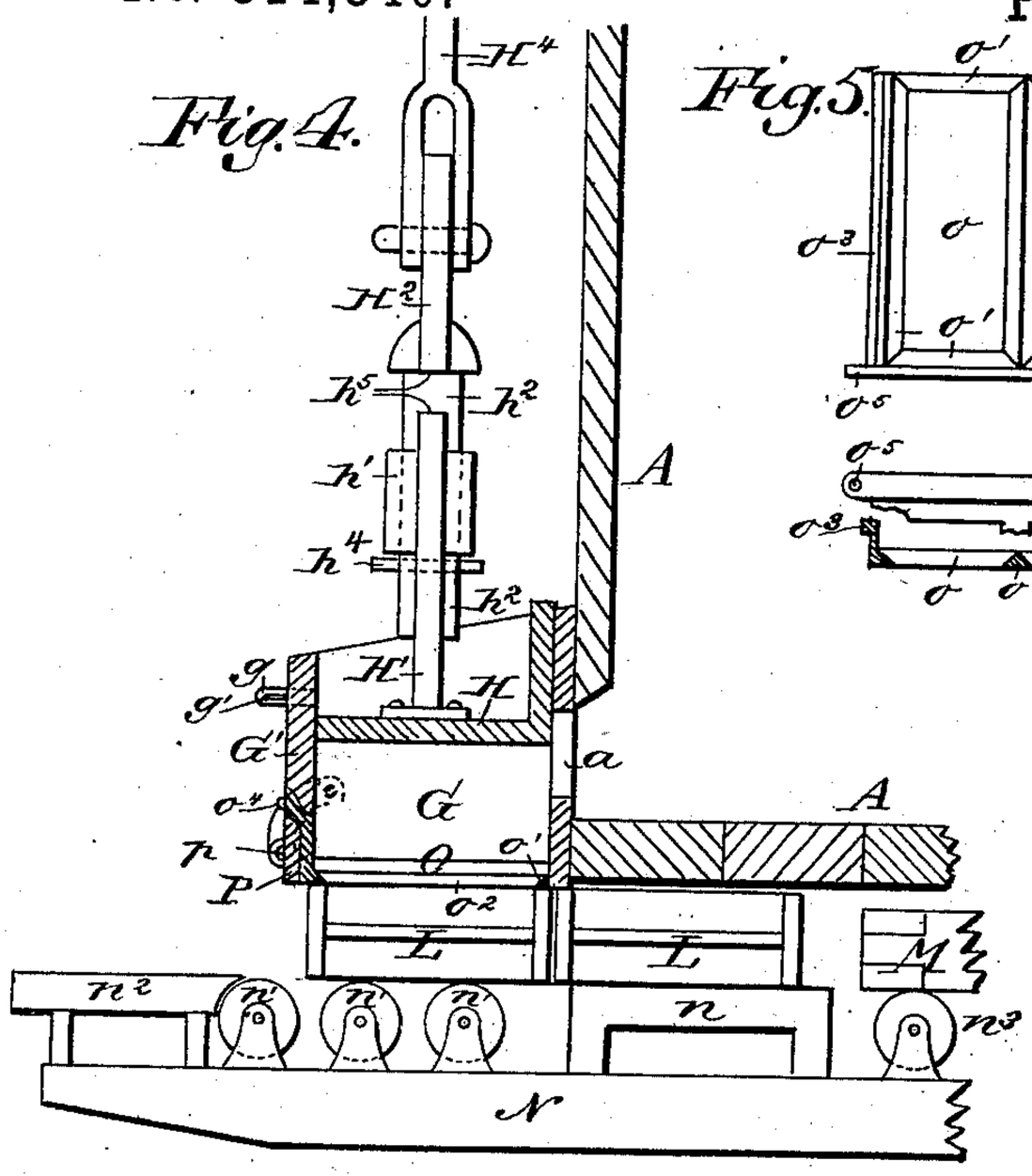


Fig. 5.

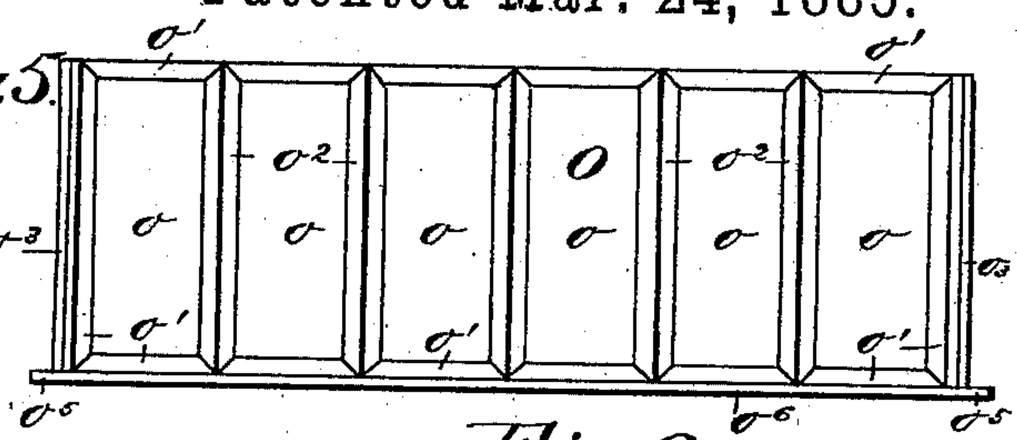


Fig. 6.

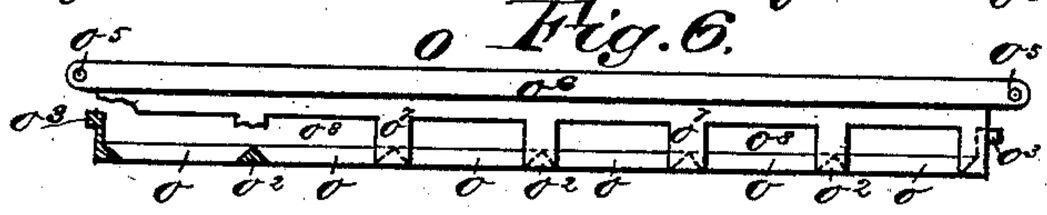


Fig. 7.

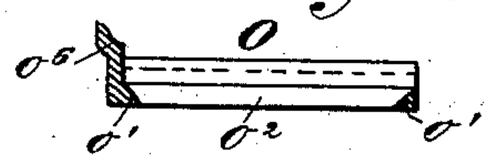


Fig. 8.

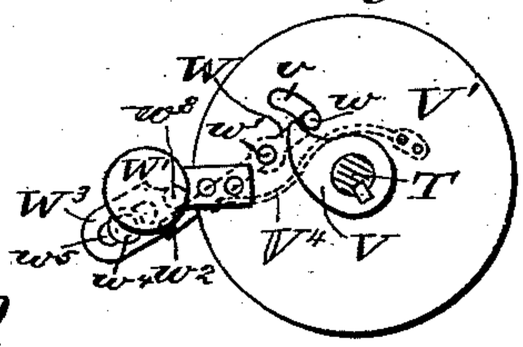


Fig. 9.

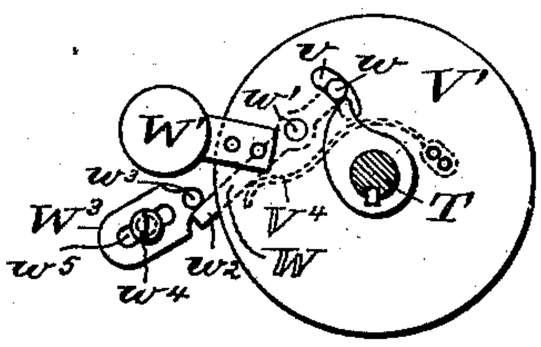


Fig. 10.

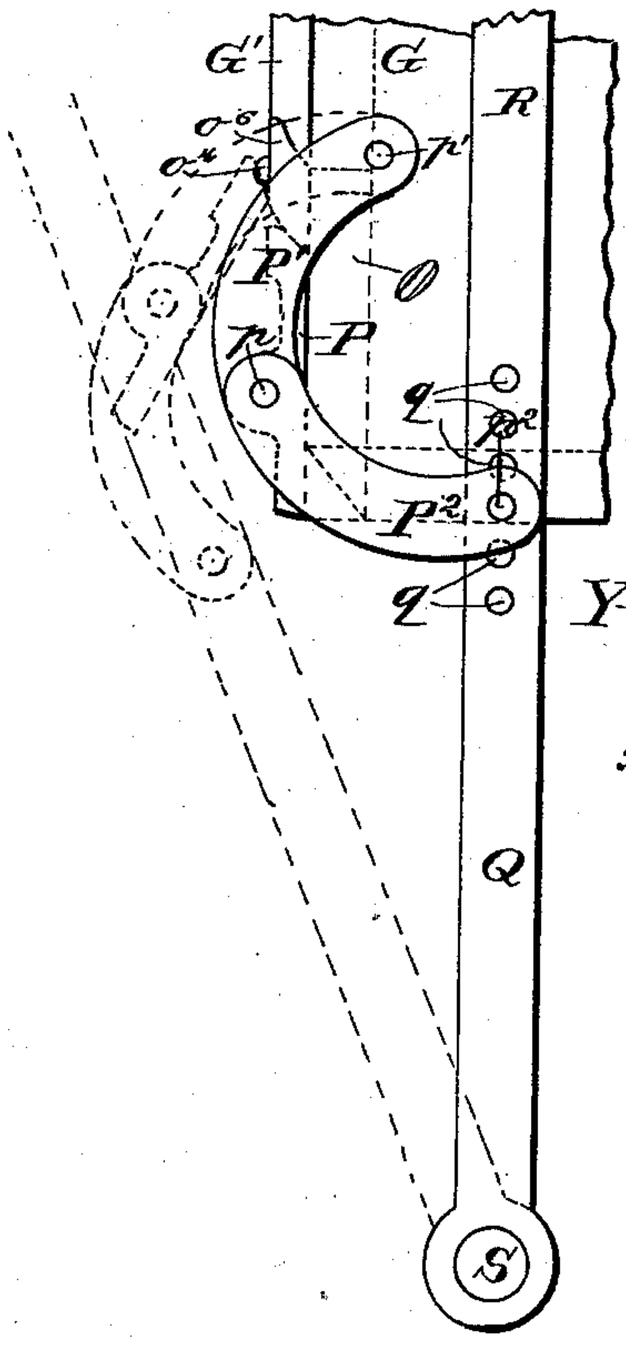
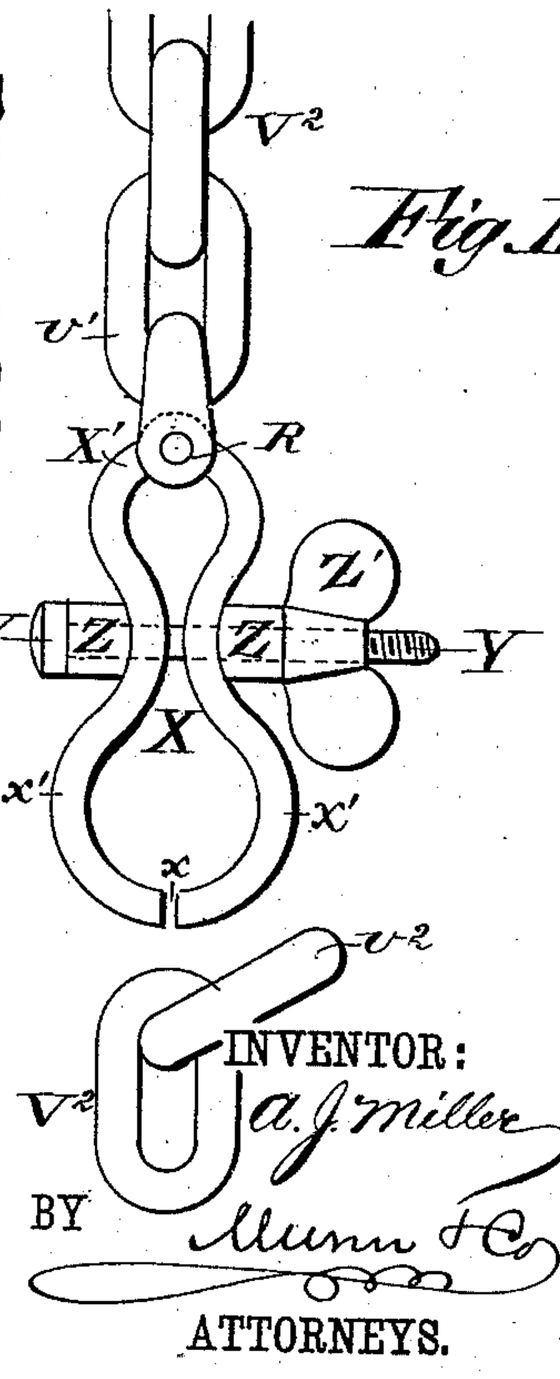


Fig. 11.



WITNESSES:

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UNITED STATES PATENT OFFICE.

ANDREW J. MILLER, OF MEADVILLE, ASSIGNOR TO HIMSELF, AND SETH L. MOORE, OF MILLEDGEVILLE, PENNSYLVANIA.

BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 314,340, dated March 24, 1885.

Application filed October 1, 1884. (No model.)

To all whom it may concern:

Be it known that I, ANDREW J. MILLER, of Meadville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Brick-Machines, of which the following is a full, clear, and exact description.

The objects of my invention are to prevent the lifting or sucking of the clay by the plunger from the filled molds, so as to produce clean sharp-cornered brick of true and uniform shape; also, to insure the discharge of obstructing sticks or stones from the press-box; also, to facilitate the filling of the molds; also, to provide improved mechanism for operating and regulating the stroke of the mold-discharger and to stop the discharger should it meet obstructions in its forward movement.

The invention consists in particular constructions and combinations of parts of the brick-machine, including a sectional arrangement of the head of the plunger to allow the plunger to rest while the filled molds are pushed from beneath it by the mold-discharger; also, a special arrangement of a relief-gate at the front of the press-box to allow obstructions to be removed therefrom, and in the means for operating said gate; also, in an arrangement of a die in the press-box, through which the clay is pressed by the plunger into the molds, and in special constructions of the clay-die; also, in the mechanism for reciprocating the mold-discharger, for regulating its stroke, and for stopping it when meeting obstructions in its movement, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a front elevation of my improved brick-machine, partly broken away. Fig. 2 is a side elevation thereof, partly broken away. Fig. 3 is a rear elevation thereof, partly broken away. Fig. 4 is an enlarged detail vertical sectional side elevation showing the devices for pressing the brick and discharging the molds. Figs. 5, 6, and 7 are detail views of the die through which the clay is pressed to fill the molds. Fig. 8 is a detail view of the mechanism for controlling the movements of the mold-discharger. Fig. 9 is a detail view of the parts shown in Fig. 8, but in different positions. Fig. 10 is an enlarged detail view in side elevation of the relief-gate of the press-box, and Fig. 11 is an enlarged detail view of the device for stopping the movement of the mold-discharger.

The letter A indicates the clay-box of the pug-mill, and B the driving-shaft of the clay grinding and pressing arms C and D, which are fixed suitably to the shaft to which is fixed the large bevel gear-wheel E, to which is connected the sweep F, to which the animals are hitched for giving motion to the machine.

At *a* is the passage for the clay from the pug-mill to the press-box G, in which works the plunger H, which receives motion from a crank-arm, I, connected to a shaft, J, on which is fixed the bevel-wheel or pinion K, which meshes with the main driving-wheel E. The head of the plunger H has a sectional construction, and consists of a lower portion, H′, bolted to the face or presser-plate of the plunger, and having an opening, *h*, and also a bearing, *h′*, for the rod or bar h^2 of the upper section, H^2, of the head. Both head-sections H′ H^2 are guided in suitable ways or plates, H^3, fixed to the clay-box, and the upper part, H^2, of the head connects by the rod H^4 with the crank-arm I. The bar h^2 has a vertically-ranging series of holes, h^3, through any one of which a stout pin, h^4, may be passed. On the downstroke of the plunger the opposing ends h^5 of the parts H′ H^2 meet fairly, and on the upstroke the part H^2 first rises until the pin h^4 strikes the lower end of the bearing *h′*, and as the upstroke continues the pin will lift the presser-plate of the plunger until the crank-pin of the connecting-rod passes the upper center, and on the next downstroke, and after the plunger rests on the clay in the box G, the bar h^2 will pass downward until the ends h^5 of the parts meet, and the continued downstroke will give the maximum pressure on the clay to sharply fill the molds L, placed below the press-box, by the forward stroke of the mold-discharger M, the empty molds being placed on the part *n* of the bed N of the machine as the discharger is carried backward, the forward stroke of which pushes the last filled mold out by the empty mold last put in

position. The molds L are filled while resting on the rollers n' of the bed N, whence they are pushed forward on the part n^2 of the bed to be removed from the machine. The mold-discharger M rests and moves on a series of rollers, n^3, journaled on the bed N. The upper part, G′, of the front of the press-box G is held upon studs g, attached to the ends of the box by keys or pins g', passed through the studs outside of the part G′, to allow its removal at any time and to hold it firmly against the outward pressure of the clay by the plunger.

In the bottom of the clay-box I propose to place a brick-forming die having series of openings corresponding in shape with the cells or chambers of the molds L, which may have any shape for producing rectangular, arched, or wedge-shaped brick.

The drawings represent the openings o of the die O made in rectangular form to pass the clay into molds L for pressing ordinary brick.

As shown in Figs. 5, 6, and 7, the die consists of a frame having six openings, o, the outer frame, o', and partitions o^2 beveling inward and downward toward the openings o, to insure the smooth and easy passage of the clay through the die into the molds as the plunger H descends. At the ends the die O has tongues o^3, to fit grooves in the ends of the press-box G, and to hold the die securely to the box I pass screws or bolts o^4 through holes of end lugs, o^5, of the upper front bar or plate, o^6, of the die into the ends of the press-box or its frame. The front plate, o^6, connects, by bars or hangers o^7, with the front bar, o', of the die-frame, and so as to leave spaces o^8 between the front bars, o^6 and o', of the die, through which spaces any stones, sticks, or other obstructions which may pass into the press-box with the clay may be removed. I close the openings o^8 with a gate or plate, P, which fits against the face of the hangers o^7, and is pivoted at each end, by a pin, p, to the toggle-bars P′ P², which are loosely held on the pivot-pin. The bars P′ are pivoted at their upper ends by pins p' to the ends of the press-box and at points back of the pivot p when the gate P is closed, and the lower or back ends of the bars P² are pivoted on pins p^2 to levers or rods Q, one of which is extended to form the handle-bar R. The levers Q are fastened at their lower ends to a rock-bar, S, which is journaled in eyes of hanger-rods S′, held to the plates S², which are fixed to the frame of the machine, and have upper flanges, s, through which the upper ends of the rods S′ pass, and nuts s' are screwed on the rods above the flanges. By screwing the nuts s' up or down the cross-bar S will be raised or lowered to raise or lower the bed N, which rests on the bar, so as to accommodate brick-molds of different depths and hold the molds snugly to the die or press-box above. The nuts s' take the strain of pressing the clay into the molds. A series of holes, q, is made in each lever Q, into any of which holes the pins p^2 may be shifted when the bar S is raised or lowered to adjust the bed N, as above described. The top of the handle-bar R has fixed to it one end of a cord or chain, R′, which passes over pulleys r r, and carries a weight, R², at its other end. The weight R² is sufficiently heavy to hold the gate P closed against the die O under ordinary circumstances in working clear clay; but when an obstructing stone or stick is carried down into the press-box and die by the plunger, the obstruction will pass through an opening, o^8, of the die and force the gate P open more or less, which being noticed by the attendant, he will seize the bar R and draw it forward fully to open the gate P, as in dotted lines in Fig. 10, to allow the obstruction to be removed through said die-opening o^8, and on releasing the bar R the weight R² will act to close the gate again.

I describe the mechanism for operating the mold-discharger as follows: A shaft, T, is journaled in the machine-frame and carries fixedly the bevel gear wheel or pinion U, which meshes with the main drive-wheel E. I show the outer end of the shaft T journaled in bearings supported on a frame, T′, connected to the main frame of the machine, and braced thereto by braces t t.

On the shaft T is keyed the cam V, next to which is placed loosely on the shaft the chain-wheel V′, around or over which passes the chain V², which passes beneath the pulleys V³, with its ends extending in opposite directions to connect with the opposite ends of the mold-discharger M, so that as the wheel V′ is turned on the shaft T by contact of the cam V with the arm w of the trip-lever W, which is pivoted at w' to the inside face of the wheel, said wheel V′ will be carried around from the position shown in Fig. 3 to that shown in Fig. 8, when the lower end or arm, w^2, of the trip-lever W will come in contact with the trip-pin w^3 on the plate W³, held to the machine-frame, to turn the trip-lever W on its pivot w' until the top of the cam V may pass the pin w, as in Fig. 9, the wheel V′ being slotted at v to allow the pin w to move over clear of the end of the cam. When the parts have reached the positions of Fig. 9, and the cam is just escaping from the pin w, the discharger M will have been carried to the extreme range of its forward stroke to position the next empty mold below the press-box, and when the cam passes the pin w of the trip-lever, a weight, W′, fixed to the chain-wheel V′, will carry the wheel back to its first position, which movement will draw the mold-discharger back again to allow the next following empty mold to be placed on the bed at n in front of it. The pin w of the trip-lever will be pushed toward the outer end of the slot v by the end of the cam V as it passes it, and as shown in Fig. 9; and to bring the trip-lever back to its first position, so that the cam may act properly on it, I provide the spring V⁴, which is held to the back of the chain-wheel V′ at one end and

acts by its other end against the lower arm, w^2, of the trip-lever, as will readily be understood.

I fasten the plate W^3 to the machine-frame by means of a bolt, w^4, which passes through a slot, w^5, of the plate, so that the plate may be adjusted to a nicety to bring the trip-pin w^3 in the exact position required to trip the lever W at the precise time to end the forward stroke of the discharger when the cells or chambers of the advancing empty mold coincide exactly with the openings *o* of the clay-die O in the press-box. The trip-plate W^3 may of course be held to place in any suitable manner allowing its adjustment, as above described.

There are times when the mold-discharger of a brick-machine meets obstructions in its forward movement—as, for instance, when the mold is not properly adjusted in front of the discharger, which then forces the mold against the frame of the machine and breaks the mold or other part of the machine. To avoid these breakages or damage of the parts, I place in the driving-chain V^2 the clevis-link X, which is hinged or held at its closed end X′ to one end link, v', of the chain V^2, said link X being split open, as at x, at its other end, so that when overpressure or draft from any cause is brought to bear on the driving-chain the link X will open at x to allow the other end link, v^2, of the chain V^2 to draw out from the link X, which will stop the motion of the discharger M without interfering with the movements of the other mechanisms of the machine.

To regulate the tension at which the link v^2 will slip from the split link X, I pass the headed screw-bolt Y loosely through the opposite sides x' of the link X, and place on the bolt outside of the sides x' the rubber or other elastic washers Z, which may be pressed against the sides x' by the thumb-nut Z′, run upon the end of bolt Y. (See Fig. 11.) The split or open link X may be made in two separate parts having eyes, through which the pin R may pass; or the link may be formed in one piece bent to shape to receive the link v^2, the screw Y, and elastic washers Z.

I show the machine mounted on a truck-frame, Y′, supported on wheels Y^2, so as readily to be moved about should occasion require.

In operating the machine the clay carried into the press-box by the arms C D will be forced down through the die O into the mold L by the plunger H, and as the head H^2 of the plunger begins to rise, leaving the head H′ and the plunger at rest, the mold-discharger M advances and pushes the filled mold L from beneath the plunger before it rises by the lift on it of the pin h^4; hence the clay is not sucked or drawn upward from the molds, as would be the case if the plunger were lifted before or while the filled mold was discharged, the rest or "dwell" of the plunger thus insuring the formation of clean, sharp-cornered, solid, and uniform bricks. During the lifting of the plunger the discharger is carried backward and another empty mold is placed in front of it to displace the one next to be filled, as hereinbefore described. The period of rest of the plunger H while the filled mold is being discharged may be made longer or shorter, as the size of the molds may determine, by placing the pin h^4 higher or lower in the series of holes made for it in the bar h^2 of the head H^2 of the plunger, as will readily be understood.

It is evident that the swinging gate P will operate substantially as above described, to permit removal of obstructions from the clay-press box G were the die O not used; but I prefer to use the die with the gate, as above set forth. Should the die not be used, the gate P will be fitted directly to an opening at the front of the press-box, instead of over the front face of the die.

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

1. In brick-machines, the head of the clay-pressing plunger, constructed in independently-moving and connected sections to give a period of rest to the plunger while the filled brick-mold is being pushed from beneath it by the discharger, substantially as shown and described.

2. In brick-machines, the combination, with the pug-mill and the press-box G, of the plunger H, having a head made in two sections, H′ H^2, connected by a bar, h^2, and pin h^4, and means for operating the plunger, substantially as shown and described.

3. In brick-machines, the combination, with the pug-mill and press-box, of the plunger H, having a head made in two sections, H′ H^2, connected by a bar, h^2, having a series of holes, h^3, to receive the pin h^4, and means for operating the plunger, substantially as shown and described.

4. In brick-machines, the combination, with the pug-mill and the press-box G, of the plunger H, having a head made in two sections, H′ H^2, connected by a bar, h^2, and pin h^4, and the connecting-rod H^4, crank-arm I, and driving-gears K E, substantially as shown and described.

5. In brick-machines, a swinging or hinging gate fitted at the side of the press-box and arranged to be closed automatically by a weight, substantially as shown and described.

6. The combination, in a brick-machine, of the gate P, hinged by links P′ to the press-box and connected by links P^2 to levers Q, fixed to a rock-shaft, S, and said levers Q being connected to a cord and weight, substantially as shown and described.

7. In brick-machines, the combination, with the press-box and plunger, of a clay-die, O, made with openings *o*, having downwardly-converging side walls, and with relief-openings o^8 above and at one side or end of the die-openings *o*, and means for closing the openings o^8 at the front of the press-box, substantially as shown and described.

8. In brick-machines, the combination, with

the press-box G, plunger H, and the clay-die O, having front openings, o^8, of the hinged relief-plate P, covering the openings o^8, and connected by links P′ to the press-box and by links P^2 to levers Q, connected to a weight acting to close the gate P, substantially as shown and described.

9. A clay-die for brick-machines, constructed with relief-openings o^8, formed by connecting the front plate, o^6, by hangers o^7 to the body of the die, substantially as shown and described.

10. A clay-die for brick-machines, constructed with openings *o*, having downwardly-converging walls, and with relief-openings o^8, substantially as shown and described.

11. In brick-machines, the combination, with the mold-discharger M, driving-chain V^2, and the chain-wheel V′, placed loosely on the shaft T, and weighted at W′, of the cam V, fixed on the shaft, the trip-lever W, having a pin, *w*, acted on by the cam, and the trip-plate W^3, having a pin, w^3, to release the lever W from the cam, substantially as shown and described.

12. In brick-machines, the combination, with the mold-discharger M, driving-chain V^2, chain-wheel V′, loose on shaft T, and weighted at W′, cam V, trip-lever W, and trip-plate W^3, of the spring V^4, acting on the trip-lever, substantially as shown and described.

13. In brick-machines, the combination of the mold-discharger M, driving-chain V^2, chain-wheel V′, placed loosely on the shaft T, and weighted at W′, cam V, trip-lever W, spring V^4, and trip-plate W^3, attached adjustably to the machine, so as to be adapted for regulating the forward stroke of the discharger, substantially as shown and described.

14. In brick-machines, the combination, with the driving-chain V^2 of the mold-discharger M, of an open or split link inserted in the chain, substantially as shown and described.

15. In brick-machines, the combination, with the driving-chain V^2 of the mold-discharger, of the link X, split at *x*, and the elastic washers Z Z, held by a screw-rod, Y, and nut Z′ outside of the arms x' x' of the link, substantially as shown and described.

ANDREW J. MILLER.

Witnesses:

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I. D. GILL.