

(No Model.)

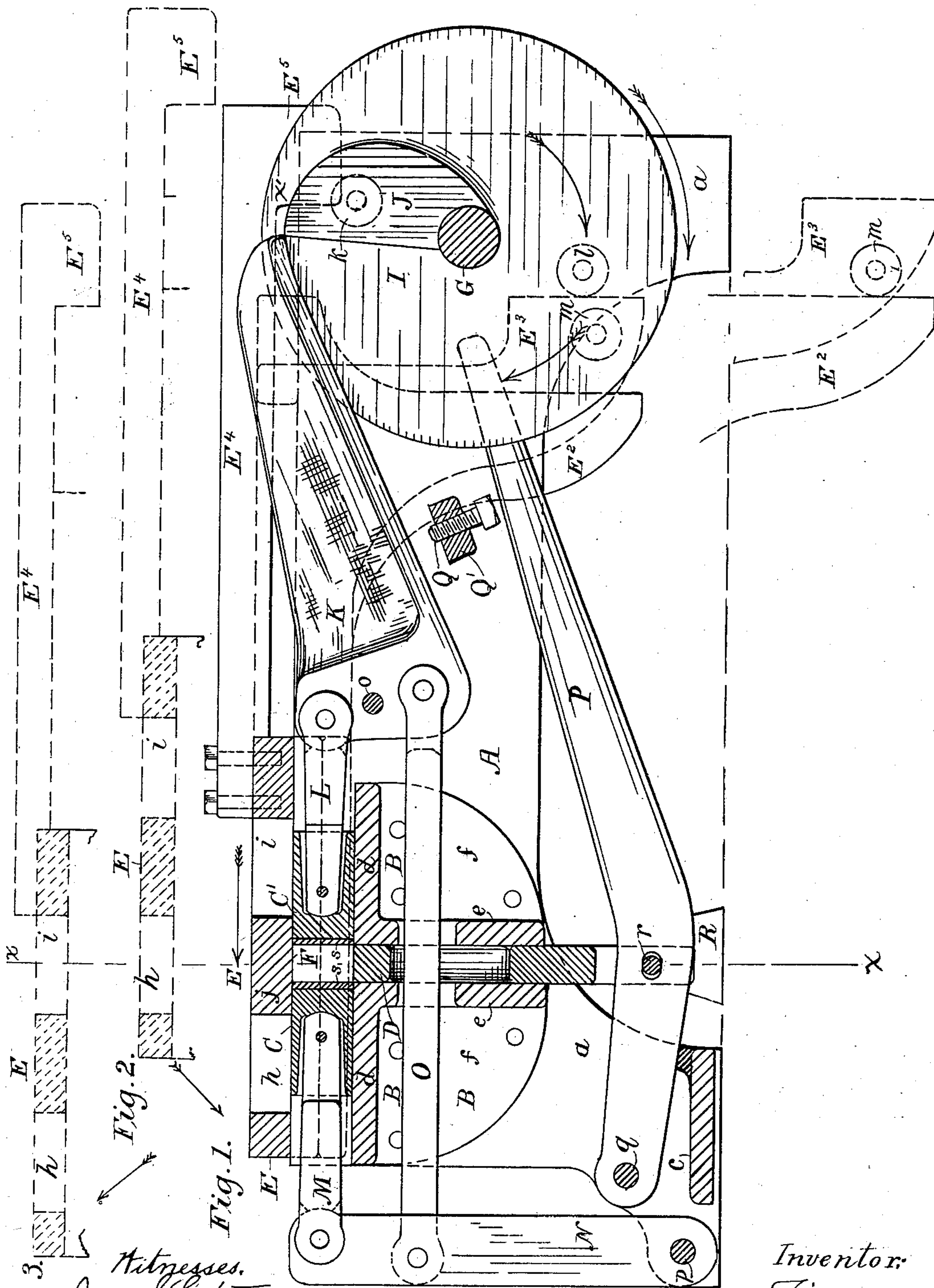
2 Sheets—Sheet 1.

J. TIFFANY.

MACHINE FOR THE MANUFACTURE OF BRICKS.

No. 314,274.

Patented Mar. 24, 1885.



(No Model.)

2 Sheets—Sheet 2.

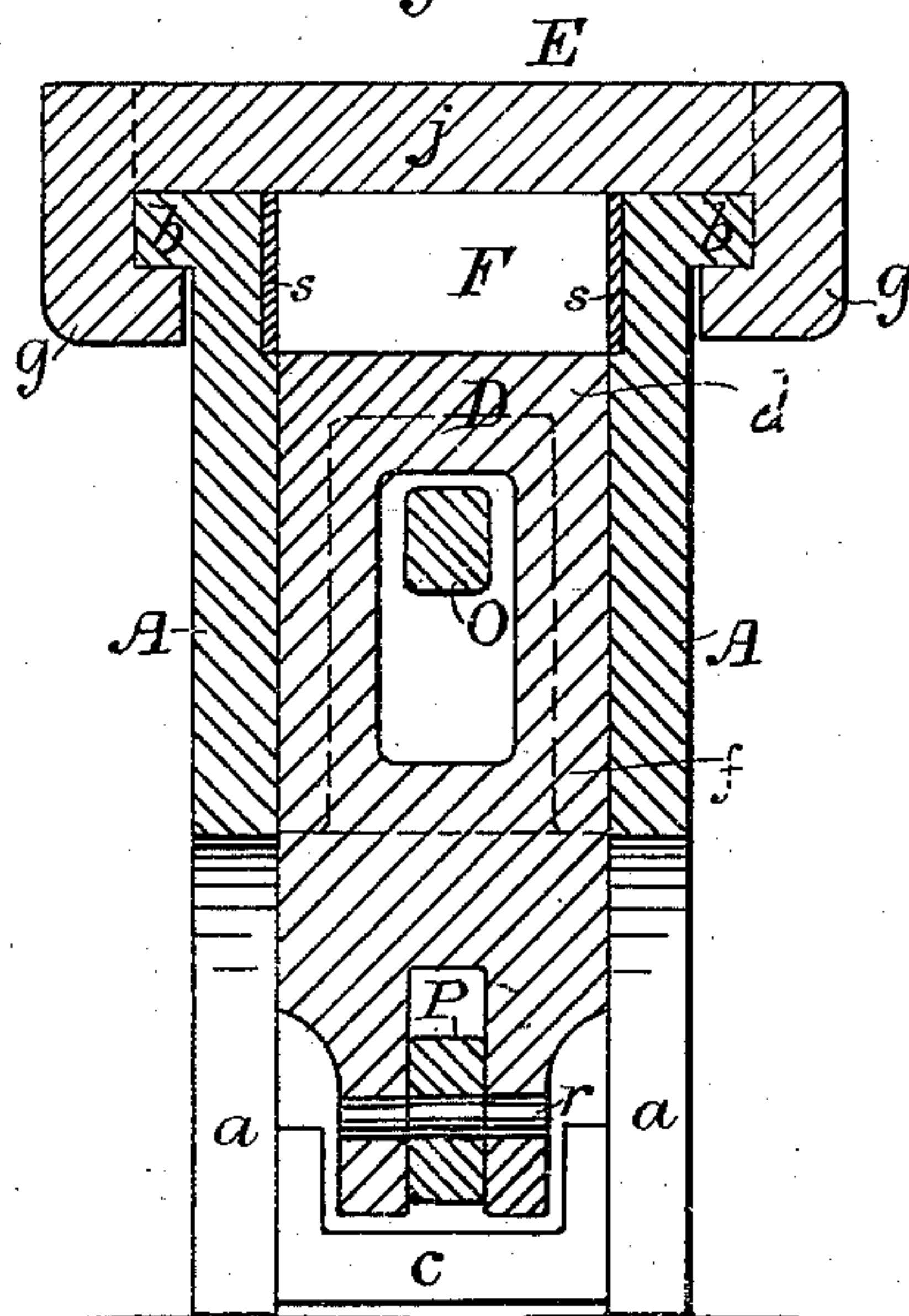
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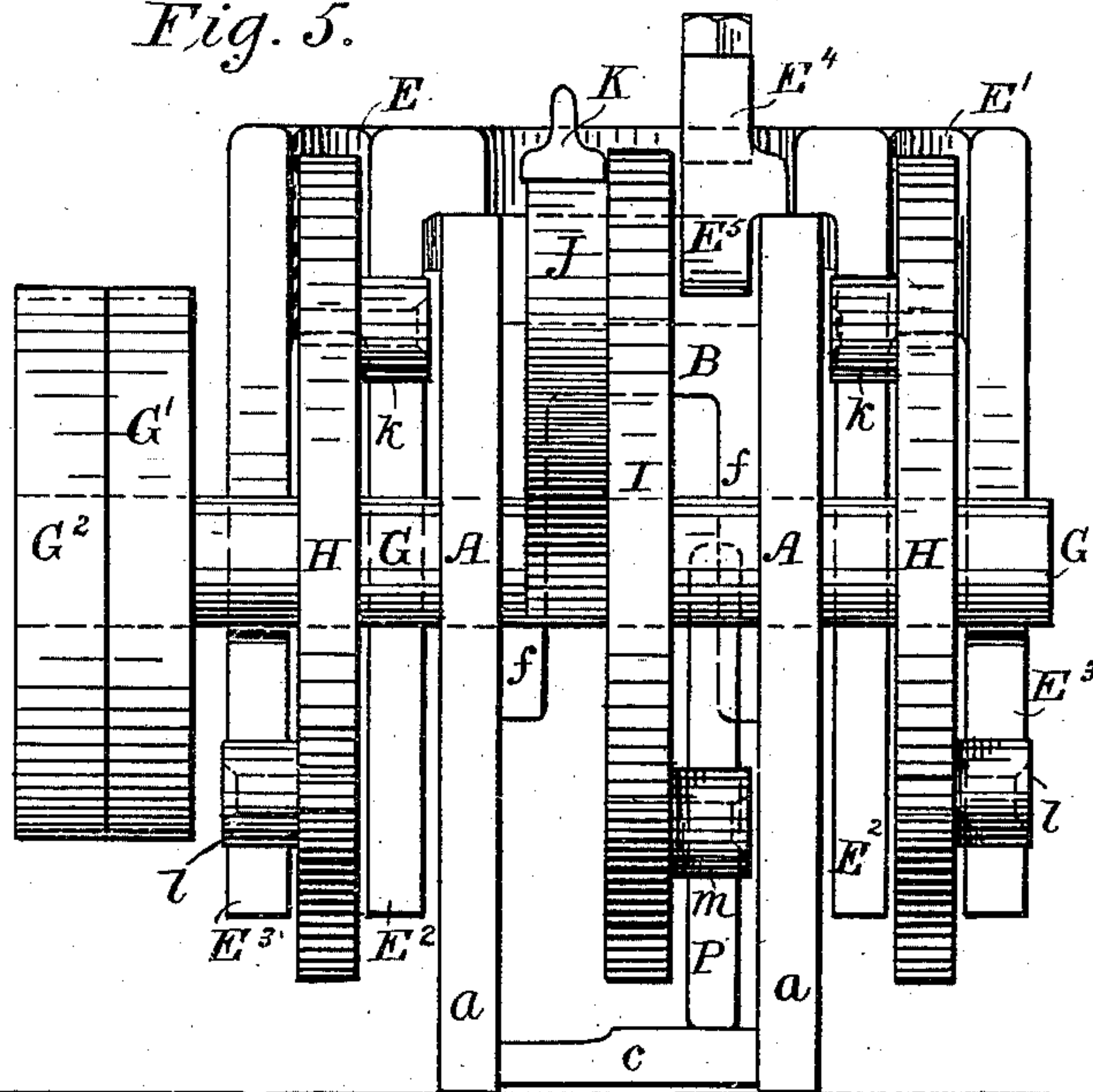
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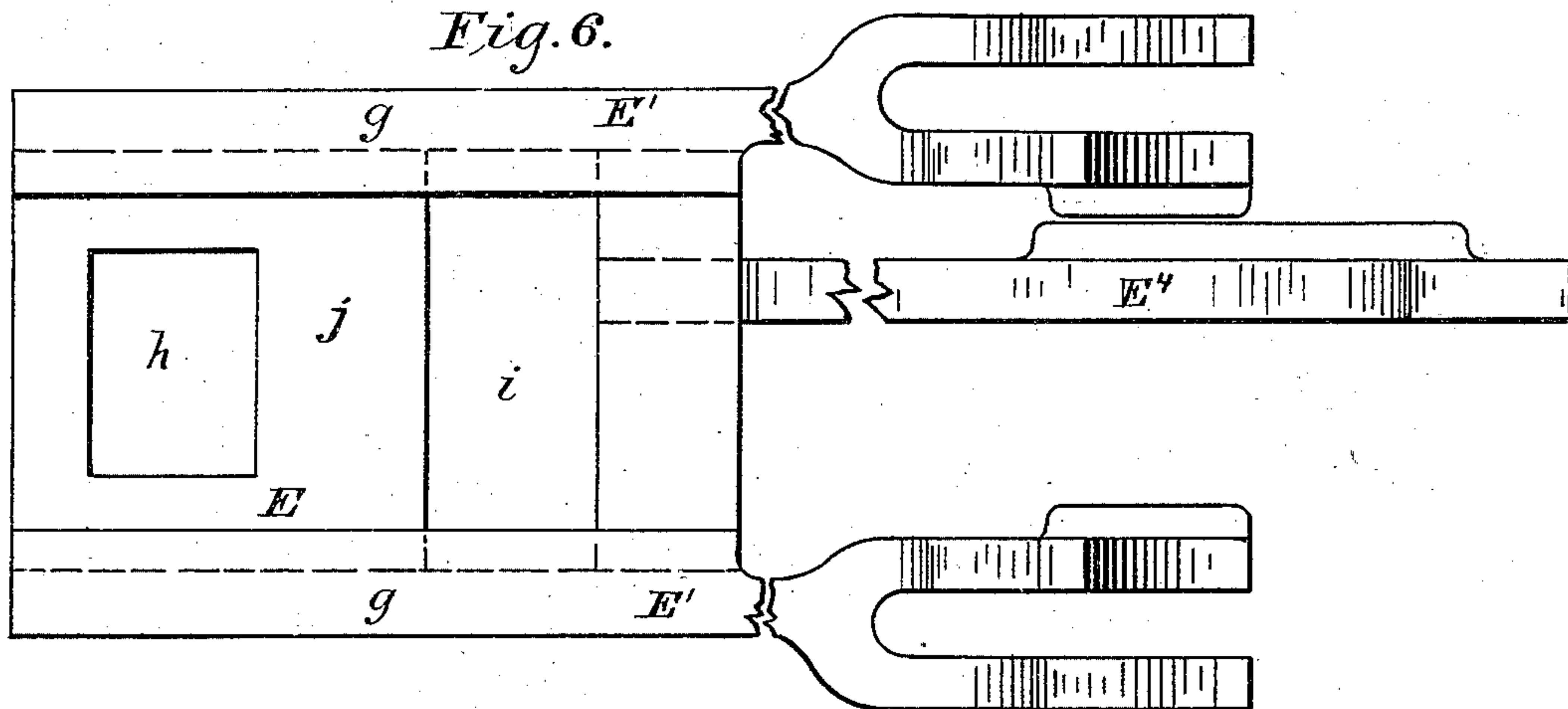
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

JOEL TIFFANY, OF HINSDALE, ILLINOIS.

## MACHINE FOR THE MANUFACTURE OF BRICKS.

SPECIFICATION forming part of Letters Patent No. 314,274, dated March 24, 1885.

Application filed November 29, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOEL TIFFANY, a citizen of the United States, residing at Hinsdale, in the county of Du Page and State of Illinois, have invented certain new and useful Improvements in Brick-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to brick-machines for producing bricks from dry clay reduced to flour. Clay which is in such condition as to contain particles so gross as to become palpable to the sense of feeling or sight will require a certain degree of moisture to give the requisite plasticity to form a brick; but the presence of moisture in clay to give it plasticity is objectionable for two reasons when the best quality of brick is sought to be made, the first of which is that, water being incompressible, the requisite pressure cannot be given to the clay, and the second, that the water in the brick being expelled during the process of burning the same, leaves the brick porous and largely weakened in its capacity to resist pressure without crushing.

The object of this invention is to produce a brick-machine simple in its construction, and having the power necessary to subject the dry clay to the very heavy pressure required in molding the bricks.

In the accompanying drawings, which represent a machine for use in the manufacture of bricks in accordance with my invention, Figure 1 is a central longitudinal vertical section of this improved brick-machine, showing the movable top frame in the position which it assumes during the molding and pressing of the brick, the dotted lines at the bottom of said figure indicating the positions of the dependent arms when the hopper and discharge-openings thereof are respectively opposite the mold. Fig. 2 is a longitudinal section in dotted lines of the movable top frame, said figure being arranged in such relation to Fig. 1 as to indicate the relative position of said frame when the clay is being supplied to the mold. Fig. 3 is a longitudinal section in dotted lines of the movable top frame, said figure being arranged in such relation to Fig. 1 as to indicate the relative position of said frame during the discharge of the molded brick. Fig. 4 is

a transverse section of the machine on the line *xx* of Fig. 1. Fig. 5 is an elevation of the front end of the machine. Fig. 6 is a plan of the movable top frame.

Similar letters of reference indicate corresponding parts in the different figures.

The clay to be molded is prepared by first drying it artificially, so as to remove all moisture as far as it is practicable to do so. It is then reduced by pressure and grinding to impalpable powder, in which no particles remain so gross as to require moisture to give plasticity to the clay, the clay becoming plastic through extreme comminution instead of becoming so through moisture. It is then ready for molding in the machine, which will now be described in detail.

The frame of this machine is shown as composed of two similar side plates, A A, of iron or steel, standing apart a distance equal to the length of a brick, said side plates being provided with legs *aa*, and at their upper edges with outward flanges or ways *bb*. These side plates are rigidly united by cross-bars *c* and by two short transverse angle-bars, B B, each of which is composed of a horizontal web, *d*, a vertical transverse web, *e*, and two quadrantal vertical longitudinal webs, *f*, uniting the horizontal and vertical transverse webs at opposite ends of the bar. The sides A A are securely bolted to the vertical longitudinal webs *f*, which serve as attaching-plates.

The horizontal webs *d* constitute the bed-plates on which the horizontally-reciprocating compressing-plungers C C' slide, and the vertical transverse webs *e e* form guides between which the vertically-reciprocating discharging-plunger D works, said angle-bars B B being so arranged relatively to each other that said transverse vertical webs are apart a distance about equal to the thickness of the brick to be formed. A horizontally-reciprocating top frame, E, provided with angular flanges *g g*, at its sides, slides on the flanges or ways *b b* of the frame A A, said angular flanges fitting under said ways and serving to hold said top frame thereon. This reciprocating top frame is provided with a hopper-opening, *h*, for supplying the mold F, and with a discharge-opening, *i*, for the discharge of the molded brick, the solid portion *j* between said



openings serving as the top plate of the mold. The mold F has its sides formed by the horizontally-reciprocating plungers C C', its bottom by the vertically-reciprocating plunger D, its ends by the side plates, A A, and its top by the sliding top frame, as aforesaid.

The mechanism for actuating the top frame, the horizontally-reciprocating compressing-plungers, and the vertically-reciprocating plunger will now be described.

Supported in bearings of the side plates of the machine, near the front end thereof, is a driving-shaft, G, provided at one end with driving and loose pulleys G' G<sup>2</sup>. On this shaft, outside the side plates, A A, are two disks, H H, severally provided with inwardly-projecting roller-pins *k k* and with outwardly-projecting roller-pins *l l*, and between said sides is a disk, I, provided with a laterally-projecting pin, *m*, and a cam, J.

The reciprocating top frame, E, is provided with horizontal arms E' E', forked at their forward ends, from which forked ends depend on the inner sides of the disks H H arms E<sup>2</sup> E<sup>2</sup> and on the outer sides thereof arms E<sup>3</sup> E<sup>3</sup>. The pins *k* on the inner sides of the disks H H engage the arms E<sup>2</sup> E<sup>2</sup>, and push the top frame from the position indicated in Fig. 2 backward into the position shown in Fig. 1, whereby the mold is closed. The pins *l l* on the outer sides of the disks H H engage the arms E<sup>3</sup> E<sup>3</sup> and push the top frame from the position shown in Fig. 1 backward into the position indicated in Fig. 3. The top frame is also provided with a horizontal intermediate arm, E<sup>4</sup>, having a dependent lug, E<sup>5</sup>, at its outer front end, with which the pin *m* on the intermediate disk, I, engages to draw the top frame forward from the end of its backward movement (indicated in Fig. 3) to the end of its forward movement, as indicated in Fig. 2. A pressure-lever, K, is pivoted at its inner rear end at *o* to the frame, and rides at its outer free end on the cam J and shaft G. A connecting-rod, L, connects the horizontally-reciprocating plunger C' with said pressure-lever above the pivot of the latter. A rod, M, connects the horizontally-reciprocating plunger C with the upper end of an upright lever, N, which is pivoted at *n* to the frame, and a connecting-rod, O, connects said upright lever with the pressure-lever at a point below its pivot, said rod O passing through slots made for that purpose in the vertical transverse webs of the angle-bars B B, and in the vertically-reciprocating plunger D, which moves between said webs. Under this arrangement the raising of the outer end of the pressure-lever by the action of the cam causes the horizontally-reciprocating plungers to move toward each other, and the lowering thereof by gravity causes said plungers to move apart. A lever, P, is pivoted at its rear end to the rear of the frame at *q*, and the lower end of the vertically-reciprocating plunger D is connected thereto by a pintle, *r*. This lever P is inclined upward and forward to a point behind the driv-

ing-shaft between the disk I and the side of the frame, and is actuated to lift the plunger and throw out a molded brick by contact of the roller-pin *m* with its forward end. The plunger D and lever P are arrested in their downward movement and held stationary during the molding of a brick by means of a stop or support, R, against which said lever or the lower end of said plunger, or both, rest during the molding operation, whereby the upper end of said plunger, which constitutes the bottom of the mold, is held flush with the upper surface of the plates *d d*. The plungers and the side plates, A A, opposite the mold, may be provided with face-plates *s*, fixed to or set in recesses therein.

The several parts of the actuating mechanisms described are so adjusted relatively to each other as to severally perform their functions in proper order of unison or succession.

The quantity of clay fed to the mold from the hopper is determined by the distance through which the horizontally-reciprocating plungers move apart in opening the mold, which movement is controlled by the distance through which the pressure-lever K is allowed to fall when released from the cam after the molding of a brick is completed. The quantity is regulated by an adjustable stop, Q, attached to a bracket, Q', projecting under said lever from one side of the machine, which stop determines the fall of the lever.

The operation of this machine is as follows: When a brick has been made and discharged, the reciprocating top frame, E, is in the position indicated by Fig. 3, the discharge opening *i* therein being opposite the mold F. The top frame is then moved forward by the action of the roller-pin *m* of the intermediate disk, I, on the dependent lug E<sup>5</sup> of the arm E<sup>4</sup> of said frame, so that the hopper *h* comes over the mold, as indicated by Fig. 2, and the requisite quantity of clay to fill the mold falls thereinto, the horizontally-reciprocating plungers C C', which constitute the sides of the mold, being then the required distance apart to secure a mold of the desired size. The top frame is then pushed backward by contact of the pins *k k* of the disks H H with the arms E<sup>2</sup> E<sup>2</sup> until the plate *j* of said frame, which constitutes the top of the mold, covers the latter, the passage of said plate cutting off the clay from the hopper and leaving the mold evenly filled. The cam J then comes in contact with the pressure-lever K and raises the same, causing the horizontally-reciprocating plungers C C' to move toward each other to the positions shown in Fig. 1, at which point the molding of the clay into a brick is completed. The cam J then moves out from under the pressure-lever K, and said lever drops and rests upon the stop Q, which has been previously adjusted at the required height to secure the desired size of the open mold. The top frame is then pushed back by the contact of the outer pins, *l l*, of the disks H H with the arms E<sup>3</sup> E<sup>3</sup>, so that the discharge-opening *i* comes opposite the



mold, as indicated by Fig. 3. The discharging-plunger is then lifted by the lever P under the action of the pin *m* of intermediate disk, I, and the molded brick thrown out. The operation is then repeated for the next brick, and so on. The bricks so molded are then burned in the usual manner.

I claim as my invention--

1. In a brick-machine, the combination, with the mold, of horizontally-reciprocating plungers constituting the sides thereof, a main pressure-lever for operating both of said plungers, connecting-rods, and an intermediate lever connecting said main lever with said plungers, and a cam for operating said main lever, substantially as described.

2. In a brick-machine, the combination, with the mold, of horizontally-reciprocating plungers constituting the sides thereof, a vertically-reciprocating plunger constituting the bottom thereof, and a sliding plate constituting the top thereof, substantially as set forth.

3. In a brick-machine, the combination, with the mold, of horizontally-reciprocating plungers constituting the sides thereof, a main pressure-lever for operating both of said plungers, connecting-rods and an intermediate lever connecting said main lever with said plungers, a cam for operating said main lever, and an adjustable stop for regulating the drop of the main lever, substantially as described.

4. In a brick-machine, the combination, with the mold, of horizontally-reciprocating plungers constituting the sides thereof, a sliding top frame provided with two openings, respectively for the feeding of the clay and discharge of the brick, and with an intermediate plate between said openings, which constitutes the top of the mold, and cams for reciprocating said frame intermittently to bring the feed-opening, the plate, and the discharge-opening successively into position over the mold, substantially as set forth.

5. In a brick-machine, the combination of the side plates covering the ends of the mold and constituting a part of the supporting-frame, angle-bars connecting said plates, provided with attaching webs at their ends, and bolts uniting said plates and webs, substantially as described.

6. In a brick-machine, the combination of the side plates constituting the ends of the mold, the angle-bars connecting said side plates, said bars being each composed of a transverse horizontal and a transverse vertical web connected at their ends by vertical webs which constitute attaching plates, the horizontally-reciprocating plungers sliding on said horizontal transverse webs, the vertically-reciprocating plunger playing between said transverse vertical webs, and a reciprocating top frame, substantially as described.

7. In a brick-machine, the combination, with the mold, of the horizontally-reciprocating plungers C C', the lever K, the connecting-rod L, connecting said lever with the plunger C', the upright lever N, the connecting-rod M, connecting plunger C with said lever N, and the lever O, connecting said lever N with said lever K, substantially as described.

8. In a brick-machine, the combination of the side plates, A A, the sliding top frame, E, the plates *d d*, the horizontally-reciprocating plungers C C', the connecting-rod L, connecting said lever with the plunger C', the upright lever N, the connecting-rod M, connecting plunger C with said lever N, and the rod O, connecting said lever N with said lever K, substantially as described.

9. In a brick-machine, the combination of the side plates, A A, the sliding top frame, E, the plates *d d*, the horizontally-reciprocating plungers C C', the connecting-rod L, connecting said lever with the plunger C', the upright lever N, the connecting-rod M, connecting plunger C with said lever N, the rod O, connecting said lever N with said lever K, the vertically-reciprocating plunger D, the lever P, and the cams for actuating said lever, substantially as described.

10. In a brick-machine, the combination, with the mold, of the horizontally-reciprocating plungers C C', the lever K, the connecting-rod L, connecting said lever with the plunger C', the upright lever N, the connecting-rod M, connecting plunger C with said lever N, the lever O, connecting said lever N with said lever K, and the adjustable stop S, for regulating the drop of lever K, substantially as described.

11. In a brick-machine, the combination, with the mold, of the sliding top frame, E, provided with openings *h i*, and having horizontal arms E', vertical arms E<sup>2</sup> E<sup>3</sup>, dependent from said horizontal arms, and a horizontal arm, E<sup>4</sup>, having a dependent lug, E<sup>5</sup>, a shaft, and disks on said shaft provided with pins which engage said dependent arms and lug, substantially as described.

12. In a brick-machine, the combination, with the mold, of the horizontally-reciprocating plungers C C', the vertically-reciprocating plunger D, the main lever K, the connecting-rods and intermediate lever connecting said horizontally-reciprocating plungers with said main lever, the sliding top frame, provided with arms E' E<sup>2</sup> E<sup>3</sup> E<sup>4</sup>, and lug E<sup>5</sup>, the lever P, the driving-shaft G, and cam-disks on said driving-shaft for actuating both levers K P and said top frame, substantially as described.

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