

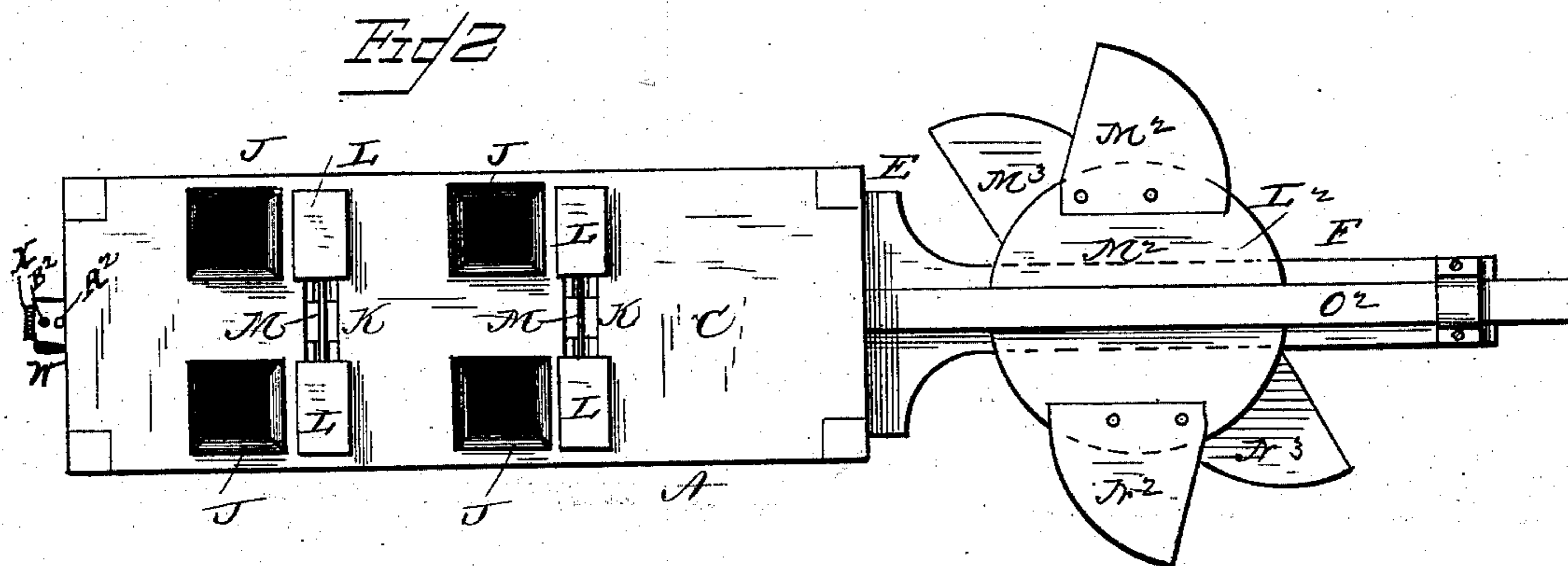
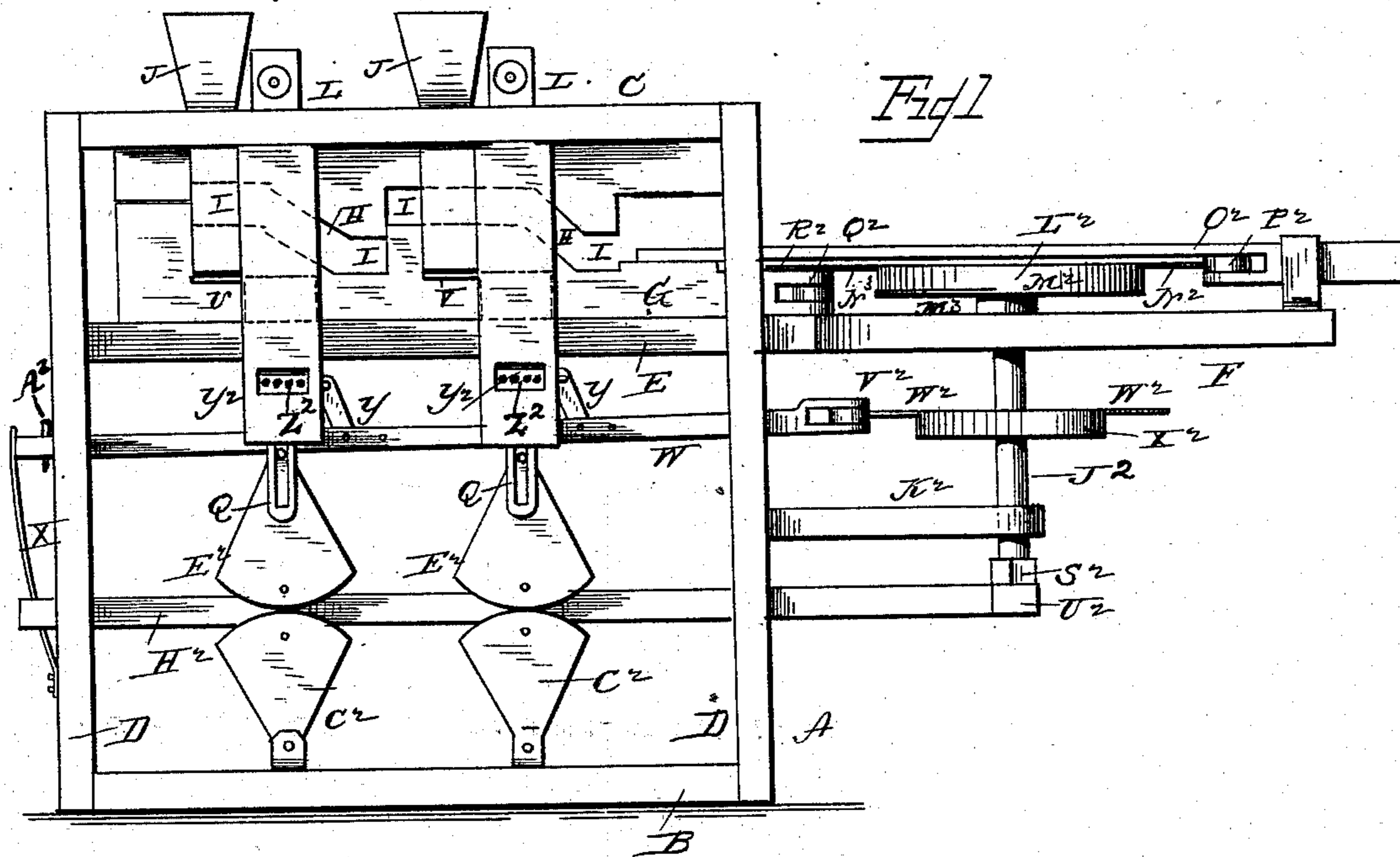
(No Model.)

3 Sheets—Sheet 1.

W. & A. B. WOODWARD.  
BRICK MACHINE.

No. 283,184.

Patented Aug. 14, 1883.



WITNESSES  
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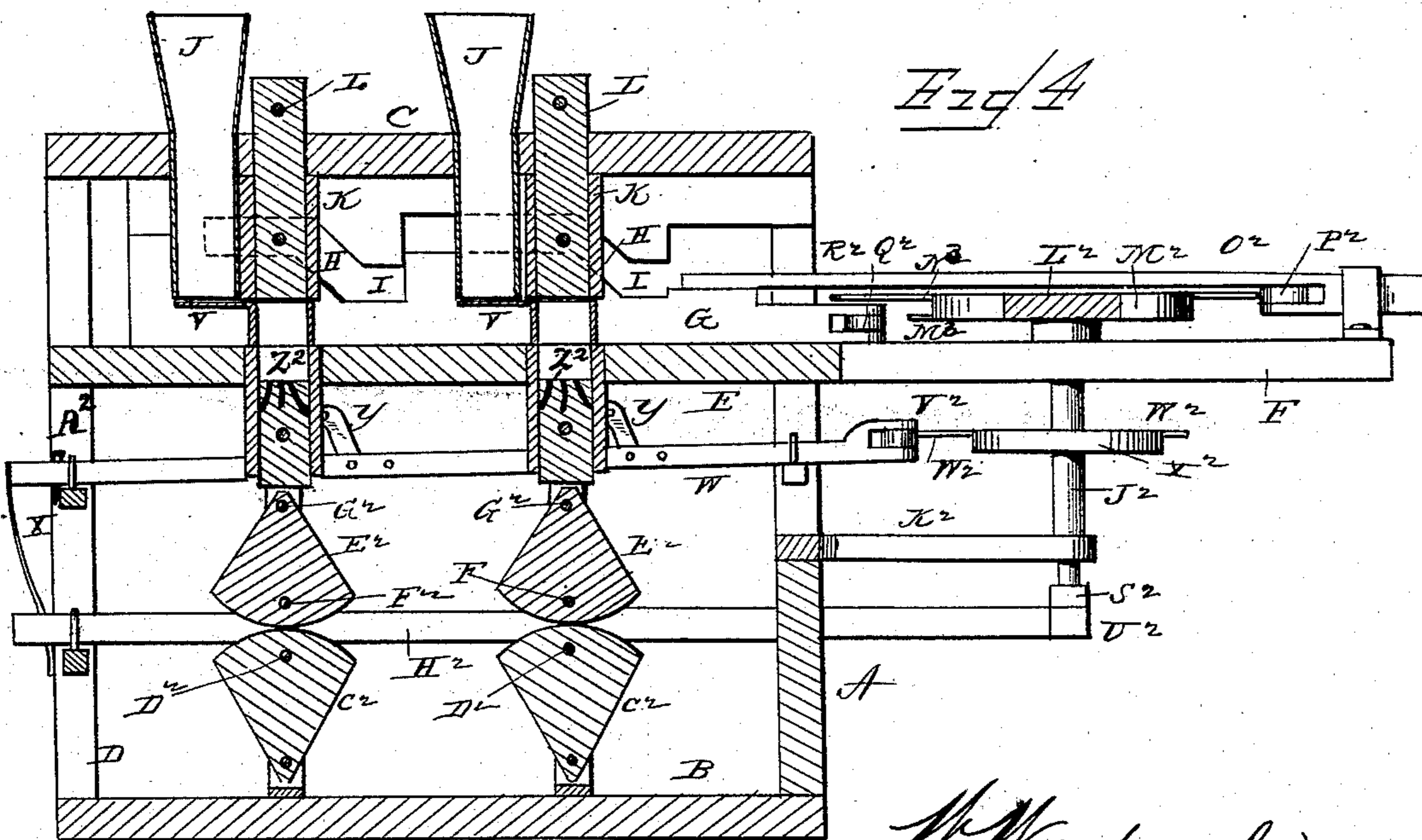
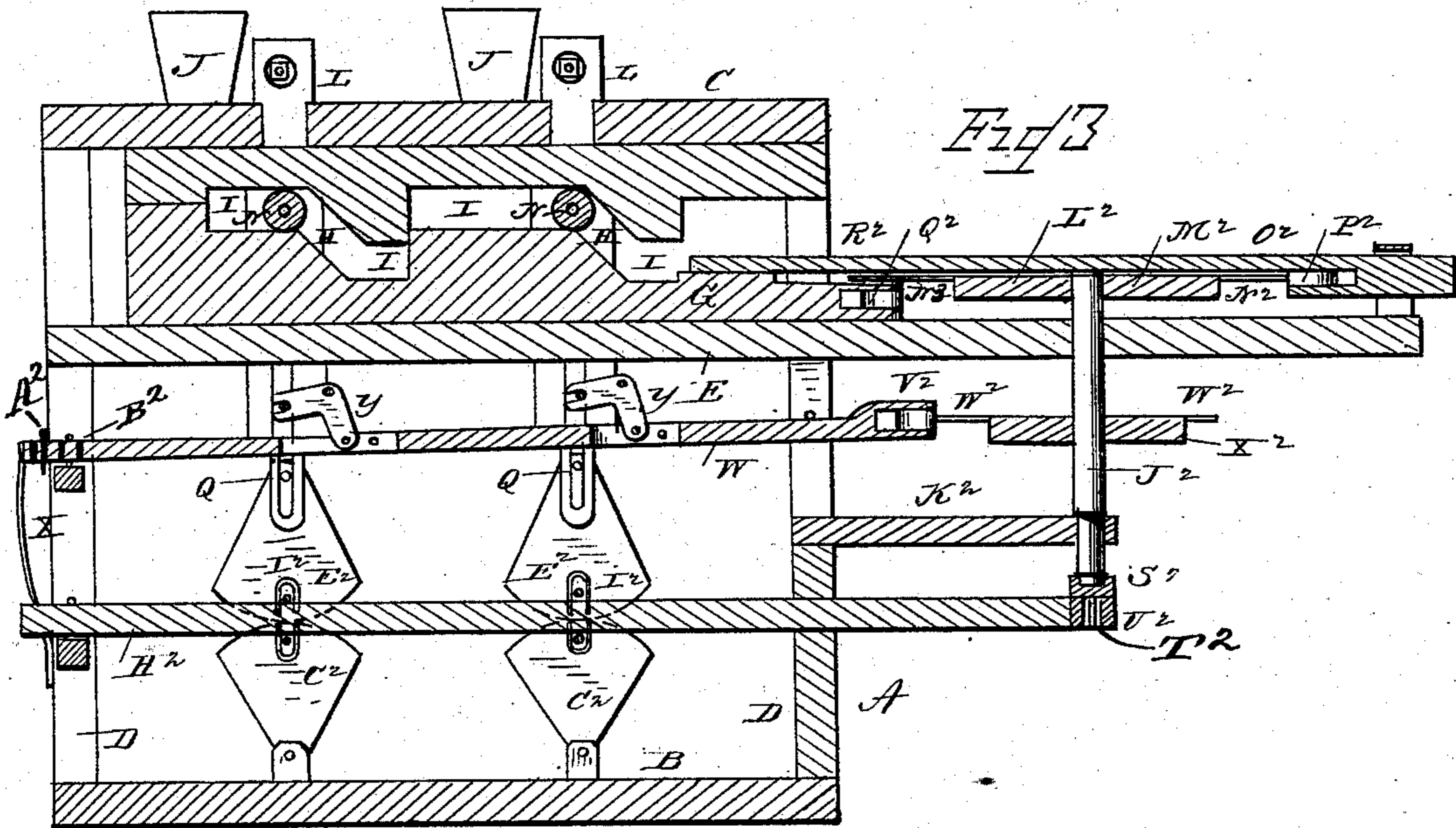
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(No Model.)

3 Sheets—Sheet 3

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Fig. 5.

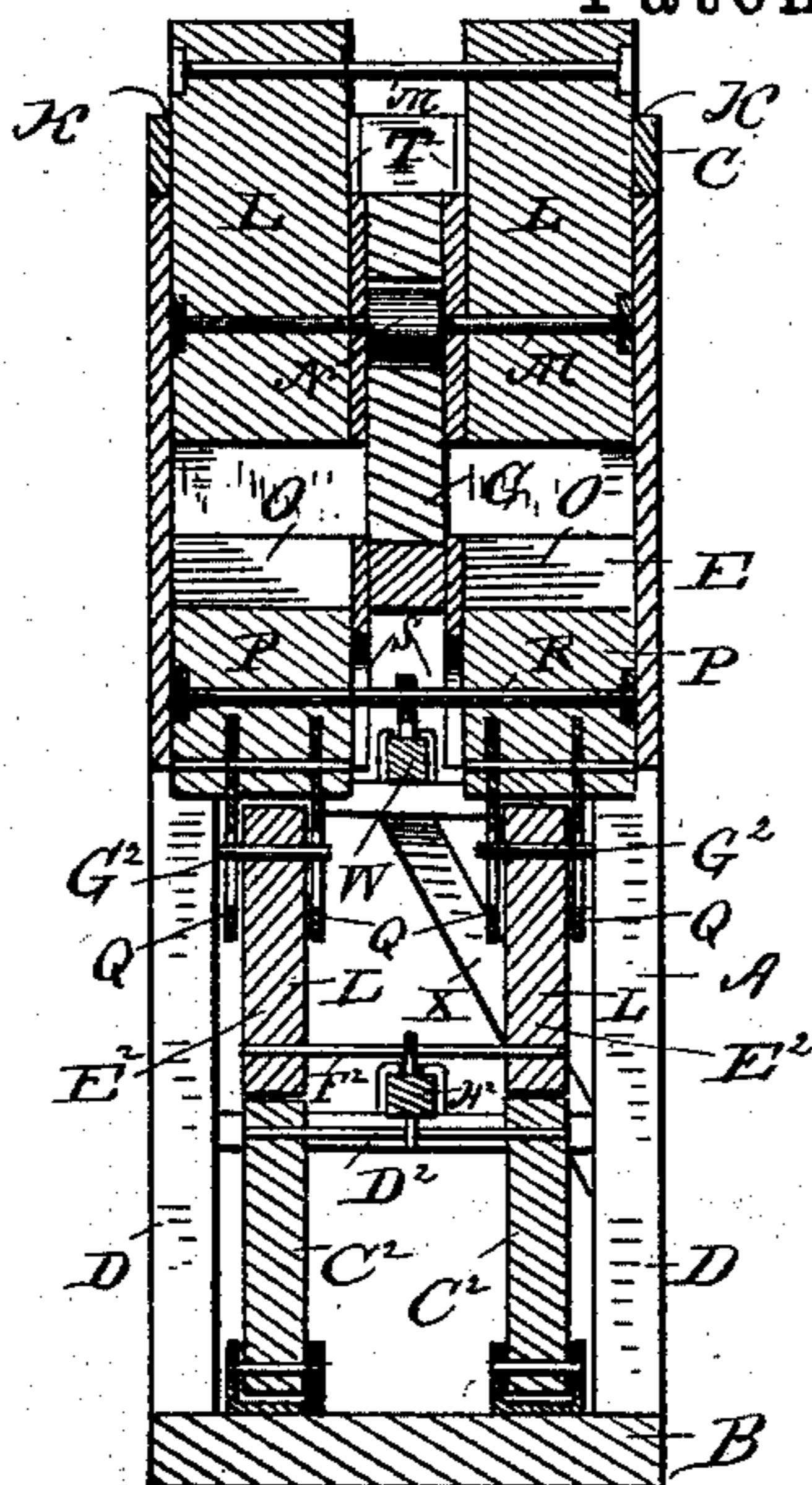
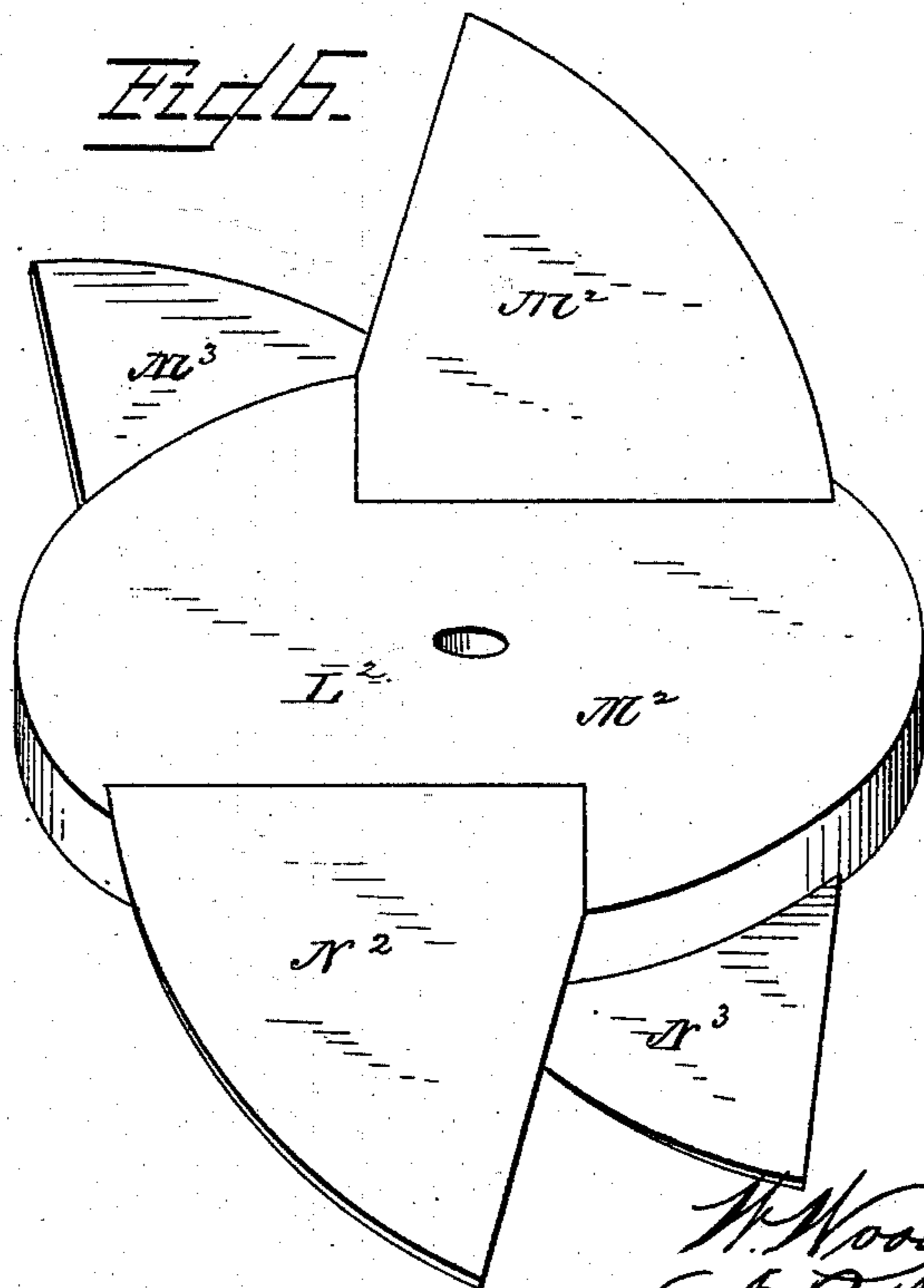


Fig. 6.



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# UNITED STATES PATENT OFFICE.

WILLIAM WOODWARD AND ABEL B. WOODWARD, OF NASHVILLE, TENN.

## BRICK-MACHINE.

SPECIFICATION forming part of Letters Patent No. 283,184, dated August 14, 1883.

Application filed May 14, 1883. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM WOODWARD and ABEL B. WOODWARD, citizens of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented a new and useful Brick-Machine, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to brick-machines; and it consists in certain improvements in the construction of the same, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed Figure 1 is a side view of our improved brick-machine. Fig. 2 is a top view of the same. Fig. 3 is a longitudinal vertical sectional view taken centrally through the machine. Fig. 4 is a longitudinal vertical sectional view taken through the plungers and operating mechanism. Fig. 5 is a vertical transverse sectional view on the line *xx* in Fig. 1, and Fig. 6 is a detail view of the main cam-wheel.

The same letters refer to the same parts in all the figures.

A in the drawings designates the frame of our improved brick-machine, which consists, essentially, of the base B, top C, and uprights or end pieces, D D, connecting the said base and top.

E is a horizontal partition arranged in the frame not far from the top and extending at one end, so as to form a bracket, F. This partition or floor serves to support a slide, G, arranged to move longitudinally, and having one or more inclined slots, H, (according to the desired capacity of the machine,) the upper and lower ends of which have horizontal extensions I.

The top plate, C, of the machine is provided with hoppers J, arranged in pairs, as shown. In the drawings hereto annexed, which represent a machine with capacity for pressing four bricks at a time, four such hoppers are shown.

The hoppers are arranged in front of the vertical boxes K, which extend through the top plate, C, and which contain the plungers or followers L, which are connected in pairs by means of transverse rods M. Said rods are equipped with friction-rollers N, that work in the slots H I of the slide G. It will thus be

seen that by operating the said slide the plungers or followers will be alternately raised and lowered. The boxes K extend nearly to the floor or partition E, from which similar boxes, O, corresponding in size and location to the boxes K, extend downwardly, as shown. The boxes O contain vertically-movable plungers or followers P, the lower ends of which are provided with downwardly-extending vertically-slotted straps Q. The plungers P are connected in pairs by means of transverse rods R, for the accommodation of which the inner ends of the boxes are slotted vertically, as at S. The inner ends of the upper boxes, K, are likewise slotted vertically at T to admit of the vertical movement of the connecting-rods of the plungers and their friction-rollers. The hoppers J extend through the top plate, C, of the machine, and their discharge-openings are on a level with the lower ends of the boxes K. The slide G is provided on both sides with laterally-projecting boxes U, one for each hopper, which serve to carry the dirt or clay from the hoppers to the mold-boxes O. The boxes U are provided with laterally or forwardly extending top flanges, V, which, while the said boxes carry the clay to the mold-boxes, serve to cut off the clay from the hoppers.

Bearings are formed in the ends of the frame below the floor E for a longitudinally-movable slide, W, which is forced automatically in a rearward direction by a suitably-arranged spring, X. Y Y are bell-crank levers mounted upon short shafts or pins between the front ends of the mold-boxes O, as shown. The lower arms of these levers are pivotally connected with the slide W, and their upper or horizontal arms are provided with slots Z, working upon or over the rods R, that connect the lower plungers, P. It will be seen from this construction that by reciprocating the slide W the plungers P will be raised or lowered; also, that the extent to which they may be lowered will depend upon the extent to which the spring X may force the said slide W in a forward direction. This may be regulated by means of a pin, A<sup>2</sup>, adjustable in any one of a series of perforations, B<sup>2</sup>, in the front end of the slide W, and adapted to bear against the front end of the frame, thereby preventing the slide from moving in a rearward direction beyond a certain point.

$C^2$   $C^2$  are segmental cams pivoted to the base B of the frame below the mold-boxes O, and connected in pairs by rods  $D^2$ , as shown. Similar cams,  $E^2$ , are arranged above the cams  $C^2$ , bearing against the rims of the latter and connected in pairs by transverse rods  $F^2$ . The cams  $E^2$  are provided at their upper ends with transverse laterally-projecting pins  $G^2$ , working in the slots of the straps Q, that extend downwardly from the plungers P, with which the said cams are thus connected.

$H^2$  is a slide moving longitudinally in suitable bearings in the ends of the frame between the cams  $C^2$  and  $E^2$ , and provided with loops  $I^2$ , that encircle the connecting-rods  $D^2$  and  $F^2$  of said cams. It will be seen that by the operation of the slide the cams are operated so as to force the plungers upwardly intermittently by pressing against the under sides of said plungers.

$J^2$  is a vertical shaft journaled in suitable bearings in the bracket  $F$ , and in a corresponding bracket,  $K^2$ , extending from the end of the machine. This shaft, to which motion may be communicated in any suitable manner and from any power desired, serves to drive the machine through intermediate mechanism, which we shall now proceed more fully to describe. The upper end of the shaft  $J^2$  has a cam-wheel,  $L^2$ , consisting of a circular disk,  $M^2$ , provided with two pairs of wings or cams,  $N^2$   $N^3$   $M^2$   $M^3$ , the wings of each pair extending, respectively, from the upper and the under side or face of the disk, and on diametrically-opposite sides of the same, one being slightly in advance of the other.

The slide G is provided with a stem,  $O^2$ , having friction-rollers  $P^2$  and  $Q^2$ , of which the roller  $P^2$ , at the outer end of the stem, is adapted to engage the wings or cams  $M^2$  and  $N^2$ , while the inner friction-roller,  $Q^2$ , is adapted to engage the wings or cams  $M^3$  and  $N^3$ . The inner end of the stem  $O^2$  has a slot,  $R^2$ , to admit of the passage of the wings  $M^2$  and  $N^2$  when the cam-wheel revolves. By this mechanism the slide G will be reciprocated twice during each revolution of the shaft. Owing to the disposition of the wings or cams, as described, the slide is first carried in a rearward direction, thus causing the boxes attached to said slide to carry the proper quantity of clay from the hoppers to the mold-boxes, into which the clay drops automatically from the bottomless carrying-boxes. The size of the mold-boxes may be regulated in the manner described by regulating the extent to which the plungers may be lowered in the said boxes. The slide having been carried rearward, so as to fill the mold-boxes, (by which same movement of the slide the plungers L are raised, so as to permit the clay-carrying boxes to pass under the said plungers,) is instantly returned in a forward direction to its original position, thereby lowering the plungers L so as to press the clay in the mold-boxes into shape without, however, exercising the heavy pressure required to mold

and compress the brick. In this position the slide and plungers L remain temporarily until the slide is acted upon by the next set of wings or cams. In the meantime other mechanism is thrown into play as follows: The lower end of the shaft  $J^2$  has a crank,  $S^2$ , which works in a transverse slot,  $T^2$ , in a plate  $U^2$ , at the end of the lower slide,  $H^2$ , by which the cams  $C^2$  and  $E^2$  are operated. This crank extends from the shaft between the sets of wings of the cam-wheel above referred to. By this mechanism the cams will be operated in such a manner as to force the plungers P in an upward direction by pressure against the under sides of said plungers, while the upper plungers, L, are lowered, thereby compressing the bricks in the mold-boxes. The bricks having thus been compressed to the desired extent, the next step will be to eject them from the mold-boxes. This is accomplished by the slide W, which is provided at its outer end with a friction-roller,  $V^2$ , acted upon by the wings  $W^2$  of a cam-wheel,  $X^2$ , secured upon the shaft  $J^2$  at the level of the said slide. The wings of the said cam-wheel are so disposed that when the upper plungers, L, actuated by the slide G, begin their upward course, they shall, by a short quick movement, force the said slide forward against the tension of the spring, thus quickly raising the plungers P and the bricks supported upon the same to the level of the floor E. In this position the plungers P are retained only for a moment, or long enough to cause the clay-carrying boxes U to push the said bricks off the plungers and onto the floor E, from whence they are to be removed either by hand or by any suitable mechanism. This having been accomplished the wing  $W^2$  releases its pressure upon the slide, and the latter will then be instantly forced back to its former position by the spring X, thus permitting the plungers P to drop and the boxes U to empty themselves into the mold-boxes. The operation is then repeated.

The sides of the boxes O have openings  $Y^2$ , and the plungers P are provided with openings  $Z^2$ , extending from their faces to their sides, so as to communicate with the said openings  $Y^2$ . This is for the purpose of permitting the air contained in the mold-boxes to escape, instead of being compressed by the plungers, and thus interfering with the operation of the machine.

We claim and desire to secure by Letters Patent of the United States—

1. In a brick-machine, the combination of the frame, the vertical guide-boxes arranged in pairs and having slotted inner sides, the vertically-movable plungers connected in pairs by transverse rods having friction-rollers, and a reciprocating slide having inclined slots with horizontal extensions working upon the friction-rollers upon the connecting-rods of the plungers, substantially as set forth.

2. In a brick-machine, the combination of the frame, the vertically-movable upper plun-

gers, connected in pairs; as shown, the reciprocating slotted slide having the friction-rollers journaled to a stem extending from the said slide, and the cam-wheel having two sets of wings arranged and operating substantially as herein described, for the purpose set forth.

3. In a brick-machine, the combination of the frame, the horizontal floor or partition, the mold-boxes arranged in pairs and extending downwardly from said floor, the plungers sliding vertically in the said mold-boxes and connected in pairs by transverse rods, the bell-crank levers connected with the said connecting-rods, the slide pivoted to the lower arms of said bell-crank levers, the cam-wheel arranged to operate the said slide, and a spring arranged to return the said slide to the position from which it is displaced by the cam-wheel, as set forth.

4. The combination of the lower plungers, the slide and bell-crank levers arranged, substantially as described, to operate the same, and a pin adjustable in the said slide, so as to limit its movement and the extent to which the plungers operated by the said slide and intermediate mechanism may be lowered in the mold-boxes, as set forth.

5. The combination of the mold-boxes, the plungers sliding vertically in the same, and having downwardly-projecting vertically-slotted straps, the slide and bell-crank levers arranged to operate the said plungers, substantially as described, the cams pivoted to the base of the machine, the cams arranged above these and having laterally-projecting pins engaging the slotted straps of the plungers, and mechanism for operating the said

gers, and mechanism for operating the said cams, substantially as set forth.

6. The combination of the cams  $C^2$  and  $E^2$ , arranged in pairs, as described, the transverse rods connecting the said cams, the slide having loops encircling the connecting-rods of the cams, the transversely-slotted plate at the front end of said slide, and the vertical shaft having a crank adapted to operate the said slide, substantially as and for the purpose set forth.

7. The herein-described improved brick-machine, comprising the frame, the hoppers, and guide-boxes, the upper plungers, the slide for operating the same, and having flanged boxes that serve to carry the dirt from the hoppers to the mold-boxes to cut off the hoppers and to push the pressed brick off the lower plungers, the mold-boxes, the lower plungers, the cams arranged to operate the same for compressing the brick, the slide and bell-crank levers arranged to operate the lower plungers, so as to eject the bricks, means for limiting the extent to which the lower plungers may be lowered, and suitable operating mechanism, all constructed, arranged, and operating substantially as herein described, for the purpose shown and specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

WILLIAM WOODWARD,  
ABEL B. WOODWARD.

Witnesses:

WM. H. WOODWARD,  
EDWARD GONNAWAY.