H. & J. H. BESSER.

CEMENT BLOCK MAKING MACHINE.

APPLICATION FILED OCT. 7, 1907.

930,455.

Patented Aug. 10, 1909.

3 SHEETS—SHEET 1.

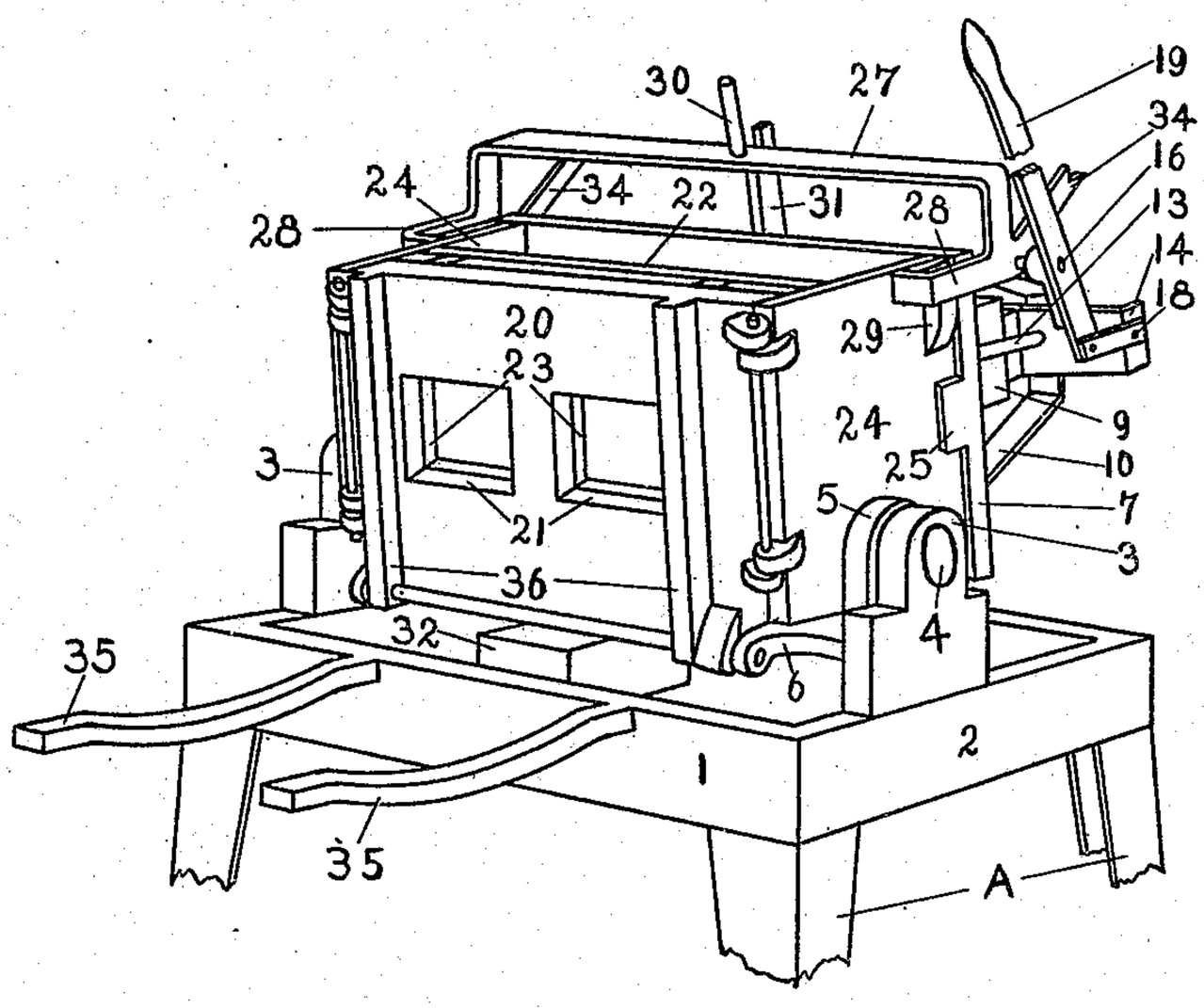

FIG. 1

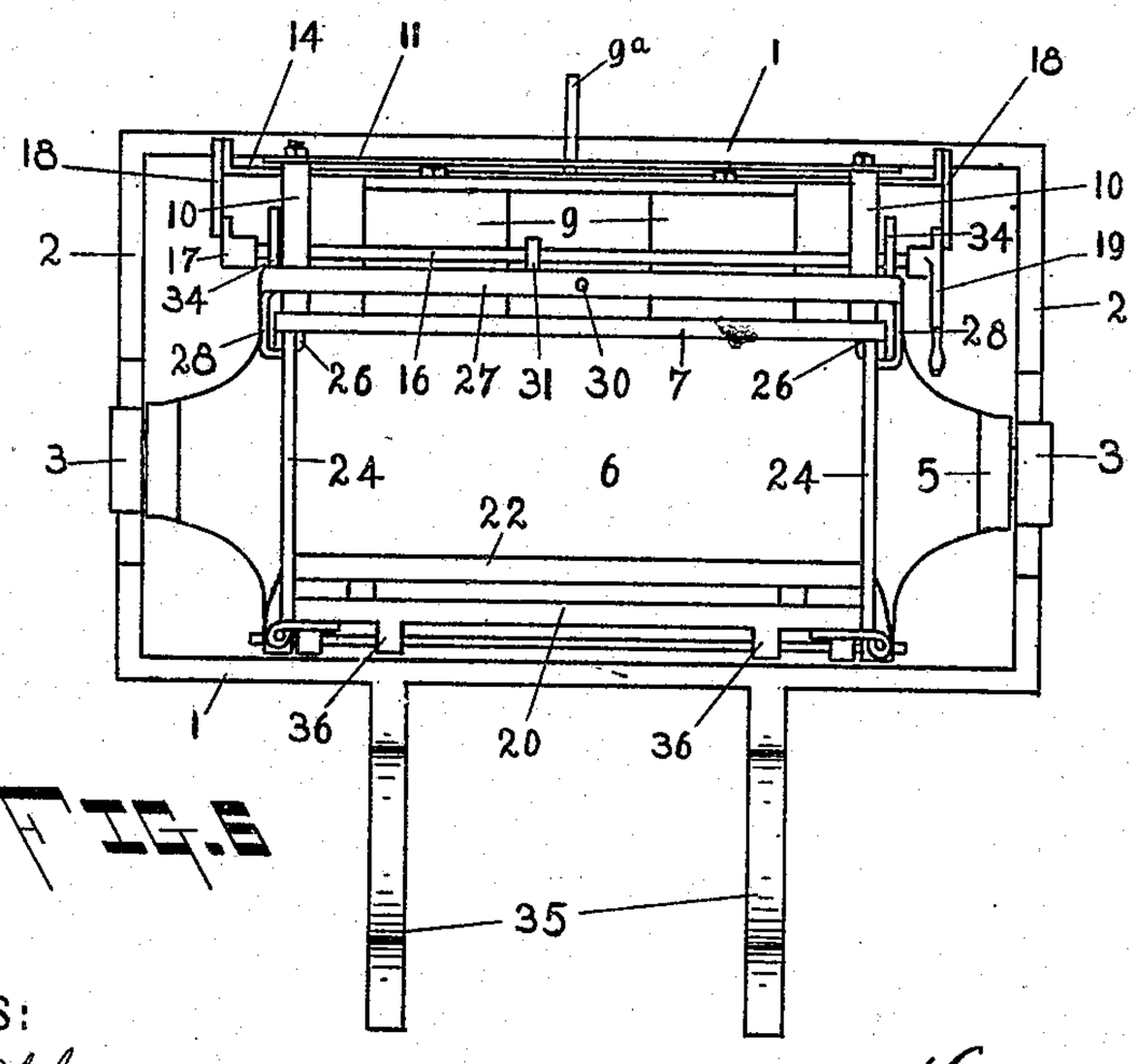

FIG. 6

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3 SHEETS—SHEET 2.

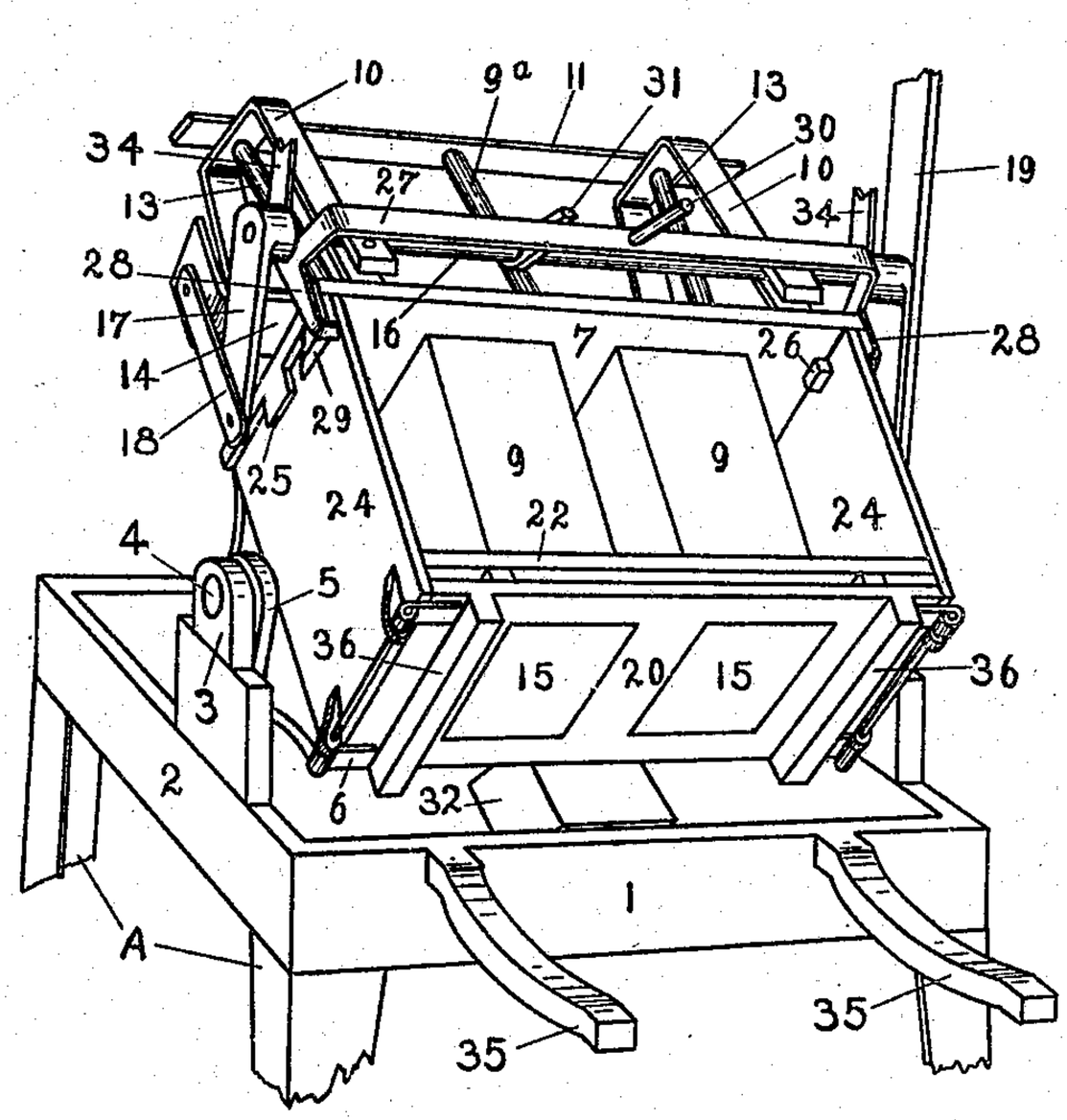

FIG. 2

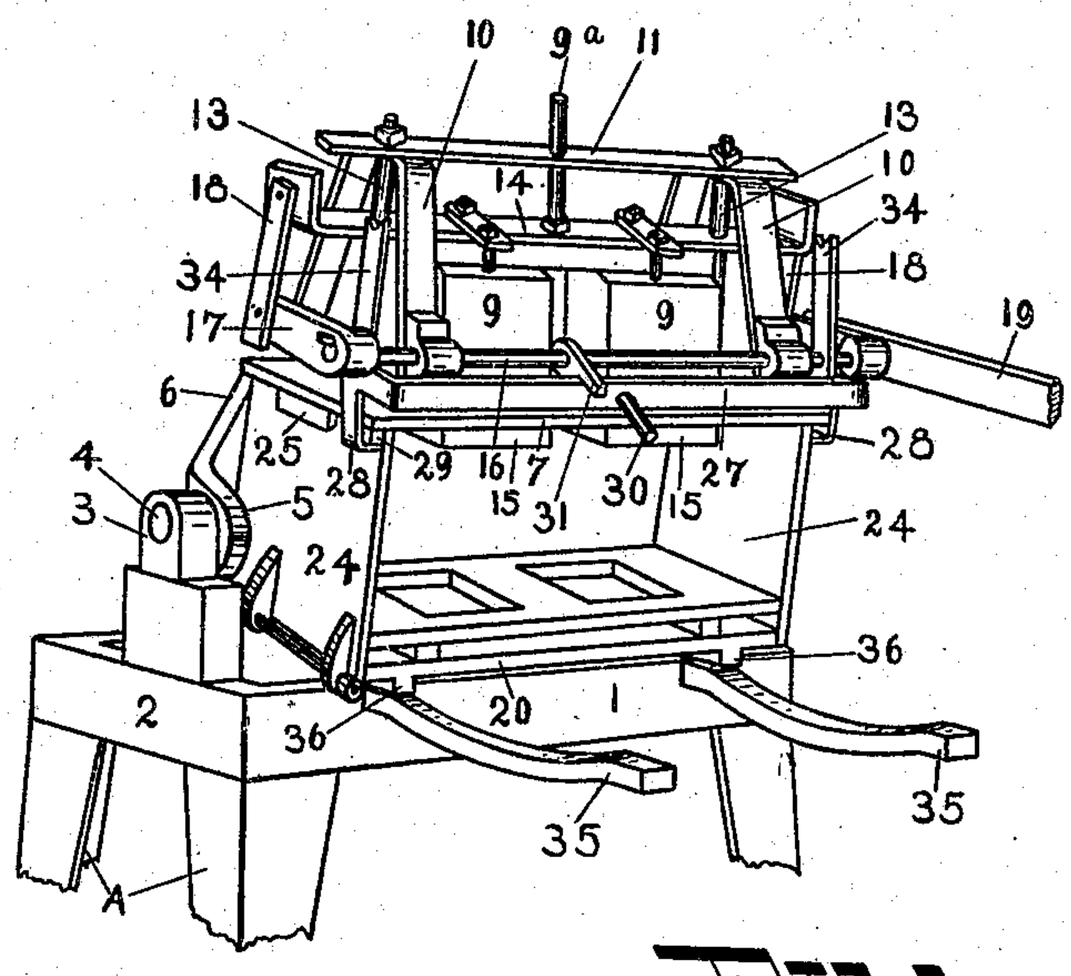

FIG. 3

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3 SHEETS—SHEET 3.

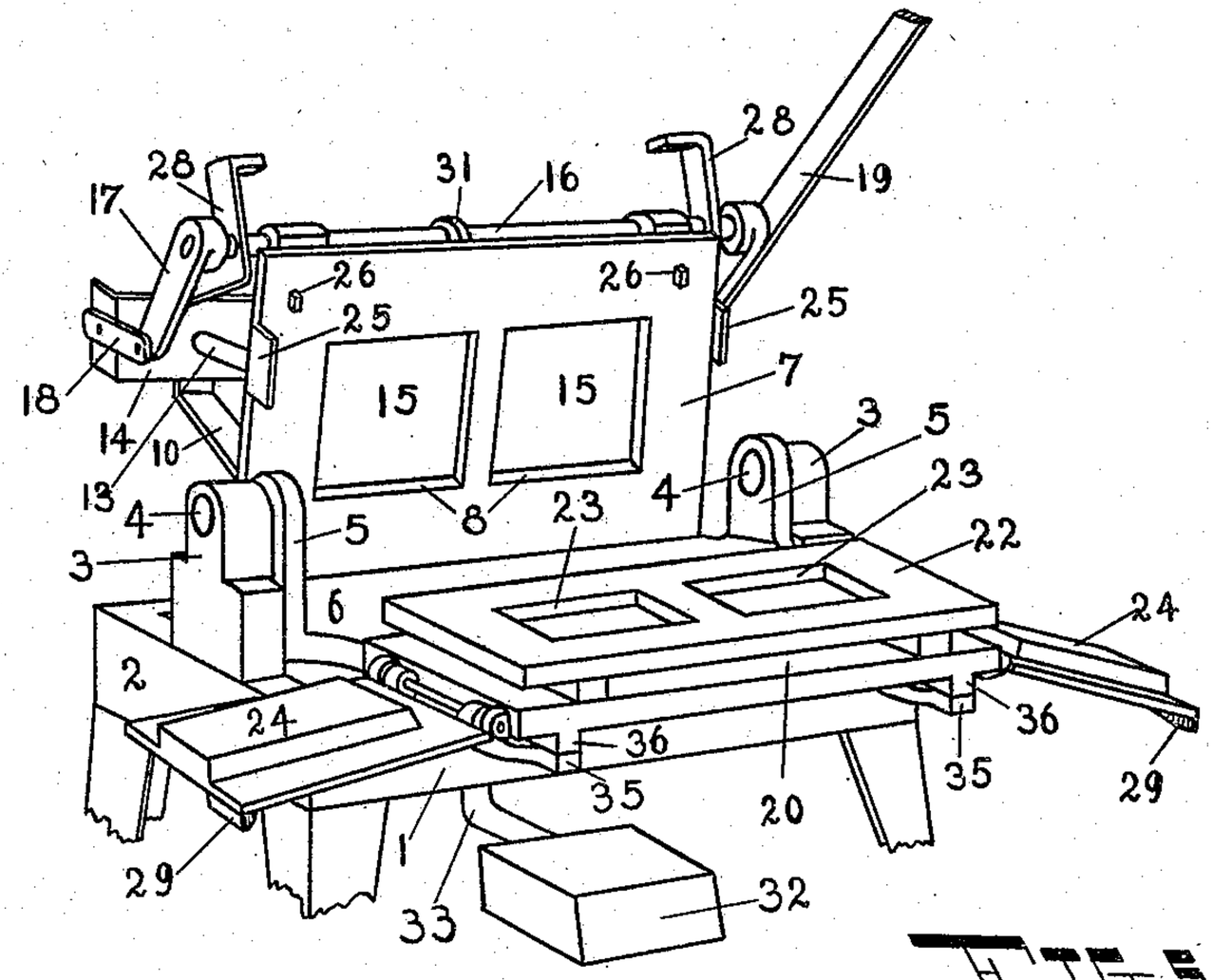

FIG. 3

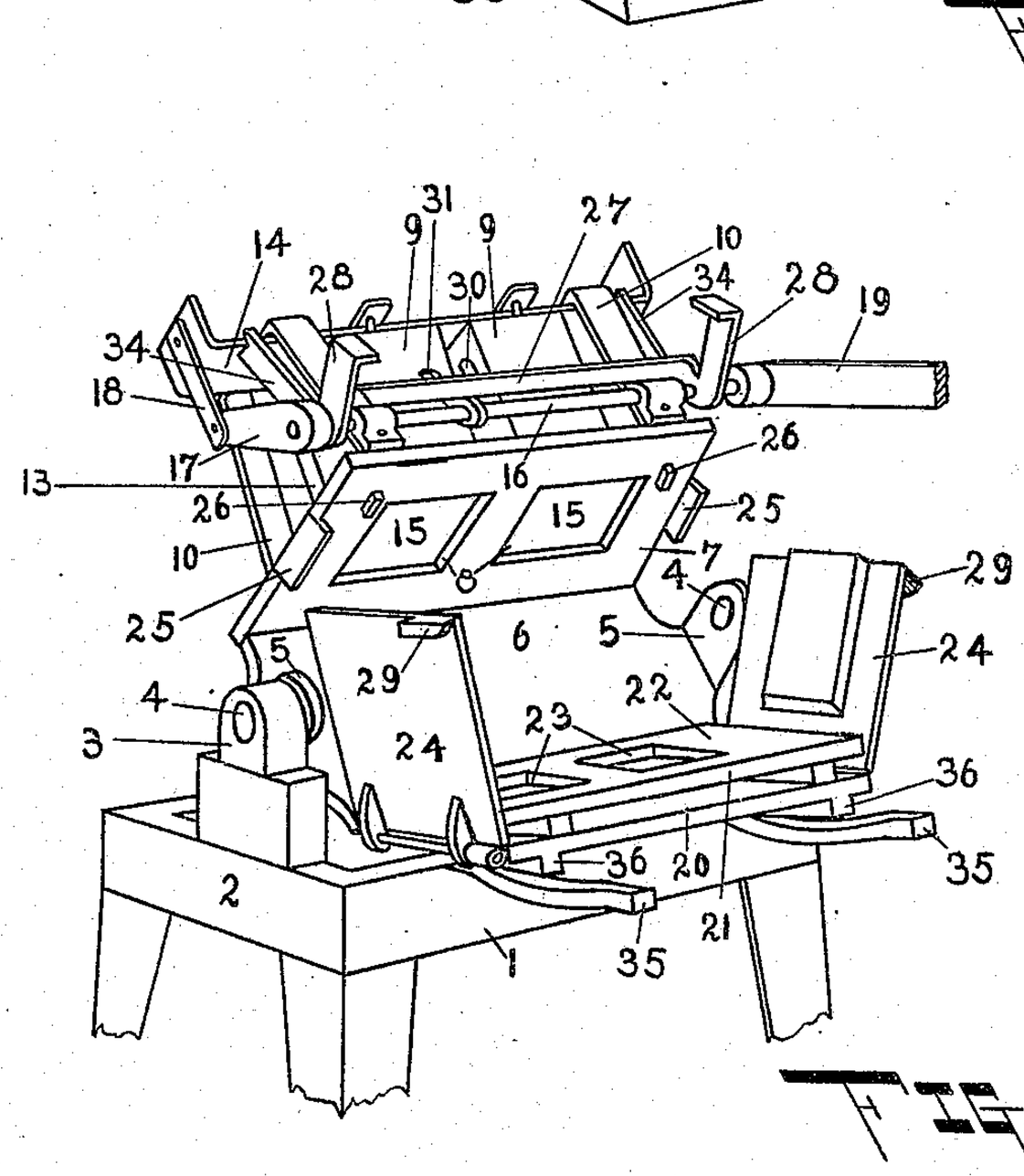

FIG. 4

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UNITED STATES PATENT OFFICE.

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CEMENT-BLOCK-MAKING MACHINE.

No. 930,455. Specification of Letters Patent. Patented Aug. 10, 1909.

Application filed October 7, 1907. Serial No. 396,349.

To all whom it may concern:

Be it known that we, HERMAN BESSER and JESSE H. BESSER, both citizens of the United States, and both residing at Alpena, in the county of Alpena and State of Michigan, have invented certain new and useful Improvements in Cement-Block-Making Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to block-molding machines and more particularly to that class of block-molding machines known as "face-down" machines, well-known in the art. Many machines of this character are incapable of producing a hollow building block for the reason that the cores must be drawn while the block is in such position that the thin walls lie horizontally, and hence upon the withdrawal of the cores, no support is left for such thin walls which will collapse.

One object of our invention is to provide a machine wherein the cores are withdrawn vertically, after which the machine is released from the block, the latter being discharged in such position that the thin walls of the block are retained in vertical position, and hence are allowed no chance to collapse.

Another object is the provision of a single lever-operated means for inserting or withdrawing the cores simultaneously.

A further object is the provision of a pivotally-supported latch for releasably retaining the end plates of the mold in closed position.

Another object is the provision of a catch for retaining the latch in locked position.

A still further object is the provision of means for retaining the cores in their withdrawn or outer position, such means also being connected to the latch, whereby the release of the side plates is accompanied by the locking of the cores in raised position.

A further object is the provision of means for counterbalancing the weight of the cores and mold-box.

Another object is the provision of a mold wherein the block, when completed, is moved forward as the mold is released therefrom.

Another object is the provision of means for supporting the block on one face or plate of the mold when the latter is in its open position.

A further object is the provision of a block machine wherein the cores and molds swing together from the receiving position to the discharging position; wherein the mold-box is retained in closed position until the cores are withdrawn vertically and the latch released to discharge the block.

In many machines, the cores are withdrawn, after which the mold-box is partially rotated to its discharge position thus affording an opportunity for the unsupported walls of the block to collapse, but in our invention the block is discharged in the same upright position as it occupies when the cores are withdrawn.

In withdrawing the cores horizontally, the tender walls of the blocks are not sufficiently set to support their own weight and consequently collapse. By moving the cores vertically, a wetter mixture can be used than if the cores were removed horizontally, and a wetter mixture effects an economy in time and labor, as well as providing a stronger better article.

Another object of our invention is the provision of means for guiding the cores in their movement into and out of the mold-box.

A further object is the provision of a nearly automatic block machine operated by a single lever which not only actuates the cores, but rotates the mold-box, the use of springs being obviated.

Our invention further consists in certain other novel features and combinations such as will be more fully described hereinafter and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view showing the mold-box in closed position to receive the material; Fig. 2 is a similar view showing the mold-box partially swung over toward its discharging position; Fig. 3 is a similar view showing the mold-box on its side and indicating the completion of the movement of Fig. 2; Fig. 4 is a similar view showing the position of the mold-box when partially open in the operation of actually discharging the article from the mold; Fig. 5 is a similar view showing the mold fully open and the article discharged; and Fig. 6 is a top-plan view of the closed mold.

In the embodiment of our invention herein illustrated, (A) indicates a suitable support or stand on which the operative elements of the device are placed. The stand

comprises side and end bars (1) and (2) respectively, the end bars supporting journal boxes (3), to receive the trunnions (4) projecting laterally from brackets (5) (5) located at opposite ends of the base or lower leaf (6) of the mold-box. This lower leaf is thus suspended by means of the brackets and trunnions and is received between the side and end bars of the frame, whereby the center of gravity of the machine is brought as low as possible to provide a firm apparatus which is not top-heavy. The bottom leaf or base (6) also serves as a support for the face-plate (not shown), any style of which can be placed on the bottom leaf to impart various effects to the blocks or other molded articles manufactured by the machine. A greater advantage, however, resides in the fact that in this machine the block is made face-downward, thus enabling the operator to firmly tamp the face in the mold and unite the body-portion of the block thereto. Also it permits the operator to provide a block having a facing of any color, design, quality of material and thickness, as the facing material is first placed in the mold and the material forming the body-portion of the block added afterward. By suspending the face-supporting leaf beneath the trunnions or bearings, the height of the machine is reduced, the apparatus reduced to the smallest possible compass, and the mold-box is low enough to permit the operator to tamp in the concrete with perfect ease.

Secured to the rear longitudinal edge of the face-supporting leaf (6) and rigid therewith is a plate (7) which we will call the top-plate. This plate, as shown, is provided with two apertures (8) (8) adapted to receive the cores (9) (9), but it is obvious that the plate may be provided with one aperture or more than two apertures for a corresponding number of cores, if desired.

As one means for supporting and actuating the cores, we provide the following apparatus: Secured near the opposite ends of the outer face of this top-plate are the bridges (10) (10) between and connecting which extends a brace (11) having a perforation intermediate its ends for a purpose hereinafter described. Rods (13) (13) extend vertically from the outer face of the plate (7) to the bridges and serve as guides for a bar (14) slidingly mounted thereon, the bar (14) extending parallel with the brace (11) and past the bridges (10) (10). Cores (9) (9) are removably secured in any suitable manner at their outer ends to the bar (14) intermediate its ends, the cores preferably being slightly tapered, the free ends (15) (15) of the cores when in the positions shown in Figs. 4 and 5, lying in the apertures (8) (8) of the top-plate (7). A stud (9^a) carried by the sliding bar (14) intermediate its ends is loosely received in the perforation in the brace (11), whereby to guide the cores and prevent lateral movement or a binding of the cores in the apertures. A shaft (16) lying parallel with the bar (14) is conveniently journaled to the forward legs of the bridges near their lower ends, the ends of the shaft projecting beyond the bridges at each end of the top-plate (7). Secured to the left-hand end of the shaft (in the drawings) is an arm (17) connected by a link (18) to one end of the bar (14) which may be suitably upturned for this purpose, the link being pivotally connected to the arm and to the bar. At the opposite end of the shaft, a lever (19) is keyed intermediate its ends, the rear end of the lever being connected to the adjacent end of the bar (14) by means of a similar link (18). Thus it is seen that a movement of the lever in one direction or the other will move the cores simultaneously in or out relative to the top-plate (7). To that longitudinal side opposite the bottom plate (7) is hinge-secured a bottom-plate (20) likewise provided with apertures (21) (21) which, when the bottom plate is thrown up in the position shown in Fig. 1, are in alinement with the apertures (8) (8) of the top-plate, the top and bottom plates then lying parallel and spaced apart by the width of the face-supporting leaf (6). A pallet (22) is received on the bottom plate, the pallet being provided with apertures (23) (23) registering with the apertures (21) (21) of the bottom plate. To the opposite ends of the bottom-plate are hinged the end-doors (24) (24), the inner faces of which may be arranged with any suitable surface desired to be impressed on the ends of the molded article. These doors are removable also in order to permit the substitution of doors having various designs on their inner faces.

It will be noted from an inspection of Fig. 1 that when the mold is in position to receive the material the end doors extend at right angles to the top and bottom plates and vertically relative to the face-supporting base (6), the free ends of the doors abutting the inner face of the top plate (7) at its ends. In order to prevent the doors from springing outward under the tamping pressure as well as affording a gage whereby to quickly determine the proper position to which to swing the doors, we provide the top plate (7) at or near its ends with the inwardly-projecting stops (25) (25) between which and the lugs (26) (26) spaced inward therefrom on the inner face of the top plate, the free ends of the doors are received and snugly held.

As one means for retaining the bottom plate and the end doors in upright position relative to the suspended base-plate (6), we may provide a clamp which in the present instance consists of a U-shaped member (27) loosely journaled on the shaft (16) and projecting from the arms of such U-shaped member, are the angular fingers (28) (28), the in-

turned free ends of which are adapted to take behind the ribs (29) (29) carried by the outer faces of the end doors near their free ends, the upper ends of the ribs being slightly rounded to conform to the arc of movement of the fingers. The U-shaped body is provided with a handle (30) to permit the clamp to engage or release the end doors, and in order to prevent the accidental release of the doors, we may provide a latch (31) pivoted on the shaft (16) and engaging the U-shaped body when the fingers are in the position shown in Figs. 1, 2 and 3, but such latch is not essential and may be dispensed with.

The operation of our machine is as follows: Assuming that the mold is in the position shown in Fig. 1 with the bottom plate and end doors in upright position, the doors engaged by the clamp and the cores withdrawn. We first insert a suitable face-plate, not shown, and then a pallet board, as (22), after which any suitable facing is introduced into the mold and tamped or not. Preferably, we prefer to introduce the facing and then a portion of the material constituting the body portion of the block before tamping, as in that manner, the body-portion and facing are more firmly united. In a "face-down" machine, a block having a facing of any color, thickness and richness or quality differing from the body-portion may be easily and quickly made, which is not possible with other machines. The facing is generally just dry enough so as not to adhere to the face-plate. Enough of the body-portion of the molded article is placed on top of the facing so that when the first stage of tamping is completed, the material in the mold will be about level with the lower sides of the cores. The operator then forces the lever toward the rear of the machine, thereby moving the cores into the mold through apertures (8) (8), the free ends of the cores passing through apertures (23) in the pallet board and closing apertures (21) in the bottom plate. The material for the body portion is of a wetness so that it will nearly quake. This material is now fed into the mold as rapidly as possible and thoroughly tamped down around and over the cores until the mold is filled, after which the surplus is stroked off. It now becomes necessary to rotate the mold a quarter of a turn, which is the first step in discharging the molded article. To effect this, the operator grasps the lever and pulls it forwardly. Ordinarily this movement would only withdraw the cores from the mold without turning the latter, but by reason of the frictional contact and adhesion of the material in the mold with the cores, the weight of the cores, and the fact that the greater weight of the mold is above the pivotal point thereof (the trunnions) (4), the mold will be reversed without withdrawing the cores. In order, however, to render this movement as easy as possible, and to prevent any liability of starting the cores in the mold, we prefer to attach a weight (32) to the base-plate (6), such weight being carried on a rod (33) depending from the base-plate and extending forwardly toward the front of the machine. This weight counterbalances the weight of the cores and permits the mold to be turned easily and gently and with the use of but slight force. The mold now occupies the position shown in Fig. 2, the bottom plate (20) being horizontal and supporting the molded article. The operator continues to press down on the lever, even after the bottom plate has been brought to rest on the frame (A) of the machine to withdraw the cores which are raised out of the mold, as shown in Fig. 3, and when the cores have reached or nearly reached their outward limit of movement, the latch (31) is released and the clamp (27) thrown back to release the end doors, which, however, do not immediately fall open, because of the stops (25).

Obviously, if some means was not provided to retain the cores in their raised or withdrawn position, they would at once return into the mold by gravity, and as one such means, we have provided the U-shaped member (27) with legs or props (34) projecting at such an angle from the U-shaped member (27) as to be brought beneath the supporting-bar (14) when the clamp (27) (28) is thrown back to release the end doors. Thus the weight of the cores is supported by the legs or props when the cores are withdrawn and the mold occupies the position shown in Fig. 3. All that is now necessary is to discharge the block, to accomplish which, the operator pulls upward on the lever as if to force the cores back into the mold. The props prevent such movement of the cores and as a result, the base-leaf is returned to its original horizontal position, and in so moving, it forces the horizontally-located bottom plate (20) forward from the frame of the machine toward the operator. The top plate moves with the base-leaf, of course, and as it moves rearwardly the stops (25) and lugs (26) are released from the end doors permitting the latter to fall outwardly away from the ends of the block, which latter rests upon the pallet-board (22), which in turn is supported on the bottom plate (20). As the bottom plate is forced forward to discharge the block, it becomes necessary to afford a support therefor, to which end we may provide the arms (35) projecting forwardly from the frame and being slightly curved to permit the bottom plate to be projected forwardly in a perfectly horizontal plane at all times, the ribs (36) (36) of the bottom plate traveling on the stationary arms. The block may be removed on its pallet board and set away to season, after which the operator brings the two end doors back into a vertical

position relative to the bottom plate and then swings the bottom plate into its original position, shown in Fig. 1, throwing the clamp forward to cause the inturned fingers (28) to engage the ribs (29) of the doors and locking the clamp in such position by means of the latch (31), whereupon the above described operation is repeated.

It will be observed that the cores and the mold swing together and that the single lever controls the movements of both the mold and the cores. The mold-box is retained in locked position throughout the entire operation of tamping in the material and swinging the mold to its discharge position. The cores are simultaneously withdrawn vertically and not horizontally, thus preventing the development of cracks in the block or the possibility of walls caving in, and this advantage is aided by withdrawing the cores before the box is unlocked by a release of the clamp (27) (28). If the box were unlocked prior to withdrawing the cores, it would become unstable and the block would be injured during the removal of the cores. One continuous pull on the lever rotates the machine a quarter of a turn to cause the block to be supported on the bottom plate and withdraws the cores. Thereafter an upward push on the lever returns a portion of the mold to its original filling position and discharges the block on the remaining portion of the mold. Many other machines withdraw the cores horizontally and then partly open as the mold is tilted to discharge position and before it reaches discharge position. The cores are controlled by a lever and form a part of the machine and the machine will manufacture more blocks in a given period of time because a wetter mix can be used where the cores are withdrawn vertically than where they are withdrawn horizontally. It will also turn out a cheaper block, since water costs less than cement and a stronger block, since a wet mix is stronger than a dry-mix block, nor will it absorb water, being practically impervious to moisture. In machines which withdraw the cores horizontally a single large core can not be used because the upper wall is left unsupported and will cave in, but our machine admits of the use of a single large core.

We are not aware of any machine in which the cores are mechanically withdrawn vertically, although there are machines wherein the cores are withdrawn vertically by hand, but this occasions much loss of time, as the cores must be carefully withdrawn, and hence their output is much smaller. It is also noteworthy that in this machine, we do not use gears or springs which are liable to become clogged and get out of order.

It is evident that many changes might be made in the form and arrangement of the several parts described without departing from the spirit and scope of our invention, and hence we do not wish to limit ourselves to the exact construction herein set forth.

Having thus fully disclosed our invention, what we claim as new is—

1. A molding machine comprising a mold box pivotally mounted at points substantially in alinement with its horizontal axis, a core and a single lever for moving the core into the mold box, partially rotating the box, withdrawing the core and then returning a portion of the box to normal position.

2. A pivotally supported face down machine comprising a base leaf, a top plate rigidly secured to one side thereof and normally lying in an approximately vertical plane, a bottom plate hinged to the opposite side of the leaf, end doors for closing the spaces between the ends of the plates, means for releasably retaining the mold in closed position, a pallet board removably placed against the inner face of the bottom plate, the top plate and pallet board provided with registering openings, a core slidingly mounted exteriorly of the top plate and in alinement with the openings, the core normally lying in an approximately horizontal plane, and a lever for moving the core horizontally into the mold through the opening in the top plate and for partially rotating the mold to bring the core into vertical position and to shift the block onto the bottom-plate, the lever adapted to withdraw the core vertically from the mold after the top plate has been brought into an approximately horizontal position and before the means for retaining the mold in closed position is released.

3. A block molding machine comprising a pivotally supported bottom, a side stationary relative to and moving with the bottom, the opposite side hinged to the bottom, end doors hinged to one of the sides, ribs carried by and located near the free ends of the end doors, and fingers pivotally mounted on that side moving with the bottom, the free ends of the fingers adapted to take over the ribs to clamp the free ends of the doors tightly against such last mentioned side.

4. A block-making machine comprising a pivotally-supported mold box, the mold box consisting of a base-leaf, an apertured top plate rigid therewith, a bottom plate hinged to the base-leaf, and end doors hinged to the bottom plate, means for releasably retaining the end doors and bottom plate in closed position, bridges mounted on the top plate, rods extending between the bridges and top plate respectively, a bar slidingly mounted on the rods, cores carried by the bar, a perforated brace connecting the bridges, a guide-pin carried by the bar and received in the perforation in the base, a rod suitably journaled relative to the top-plate, a lever

secured intermediate its ends to the rod at one end, an arm secured to the opposite end of the rod, and links connecting the arm and the lever to the respective ends of the bars for inserting or withdrawing the cores simultaneously through the apertures in the top plate.

5. A block machine comprising a pivotally-supported mold box, one side of which is apertured, guides mounted on the apertured side of the box, a bar slidably mounted on the guides, cores secured to the bar and movable into and out of the box through the apertured side, a shaft suitably journaled relative to the apertured side, a lever secured intermediate its ends to one end of the shaft, an arm secured to the opposite end of the shaft, and links connecting the arm and the lever to the sliding bar.

6. A block machine comprising a pivotally-supported mold box, one side of which is apertured, guides mounted on the apertured side of the box, a bar slidably mounted on the guides, a core secured to the bar and movable into and out of the box through the apertured side, a perforated brace carried by the guides, a pin carried by the bar and slidingly received in the perforation in the brace, and a lever linked to the bar for inserting and withdrawing the core relative to the box.

7. A block machine comprising a mold-box, a core carried by the mold-box, means on the mold box for supporting the core, a lever pivotally connected to the mold box, a link connecting the lever and the core supporting means, for inserting and withdrawing the core relative to the mold-box, a perforated brace, and a pin carried by the core and received in the perforation in the brace.

8. A block machine comprising a pivotally-supported knock down mold box, one side of which is apertured, a suitably supported sliding bar, a core carried by the bar and removably receivable in the mold box, a lever for inserting and withdrawing the core relative to the mold box, means for releasably locking the mold-box in closed position, and means carried by the locking means for retaining the core in its withdrawn position simultaneously with the release of the mold by the locking means.

9. A block machine comprising a pivotally-mounted knock down mold, a core carried by the mold, and movable into and out of the mold, a lever, a link connecting the lever and core for actuating the core and for partially rotating the mold, a clamping means for locking the mold in closed position, and a leg or prop carried by the clamping means and adapted to support the core in its withdrawn position when the clamping means is moved to release the mold.

10. A block machine comprising a pivotally-supported base leaf, a top plate carried thereby, a bottom plate hinged to the base-leaf, and doors hinged to the bottom plate, clamping fingers pivotally mounted on one of the plates, suitably-located ribs engaged by the clamping fingers to retain the bottom plate and end doors in closed position, a core carried by the top plate and movable into and out of the mold, means for supporting the core, means for actuating the core and for partially rotating the mold, and a leg connected with the clamping fingers and adapted to support the core in its withdrawn position subsequent to the partial rotation of the mold, the withdrawal of the core and the release of the clamping fingers.

11. A block machine comprising a pivotally-supported knock-down mold box, means for releasably locking the box in closed position, a core slidably mounted on the box and movable into and out of the box, and a lever pivotally secured to the box and connected to the core, a continued pull on which will partially rotate the box and subsequently withdraw the core therefrom prior to the release of the locking means.

12. A block making machine comprising a pivotally supported mold box, the box consisting of a base leaf, an apertured top plate rigid relative thereto, a hinged bottom plate and end doors hinged to the bottom plate, means for releasably locking the end doors and bottom plate in closed position, bridges carried by the top plate, cores mounted on the top plate in alinement with the apertures therein, a guide for the cores and a lever connected with the cores, for moving them into and out of the mold and for swinging the mold from charging to discharging position and back.

13. The combination in a block machine with a mold box consisting of a base plate, a core supporting plate secured thereto, a front plate hinged to the base plate and end doors hinged to the front plate, of a pair of inturned fingers connected together and pivotally mounted relative to the core supporting plate and ribs on the free ends of the end doors, the ends of the fingers taking behind the ribs to draw the end doors, toward the core supporting plate.

In testimony whereof, we affix our signatures in presence of two witnesses.

HERMAN BESSER.
JESSE H. BESSER.

Witnesses:
BYRON H. OLDS,
V. C. RUTLEDGE.