

No. 763,634.

PATENTED JUNE 28, 1904.

W. RAAB.
MACHINE FOR FORMING BUILDING BLOCKS.

APPLICATION FILED FEB. 4, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 2.

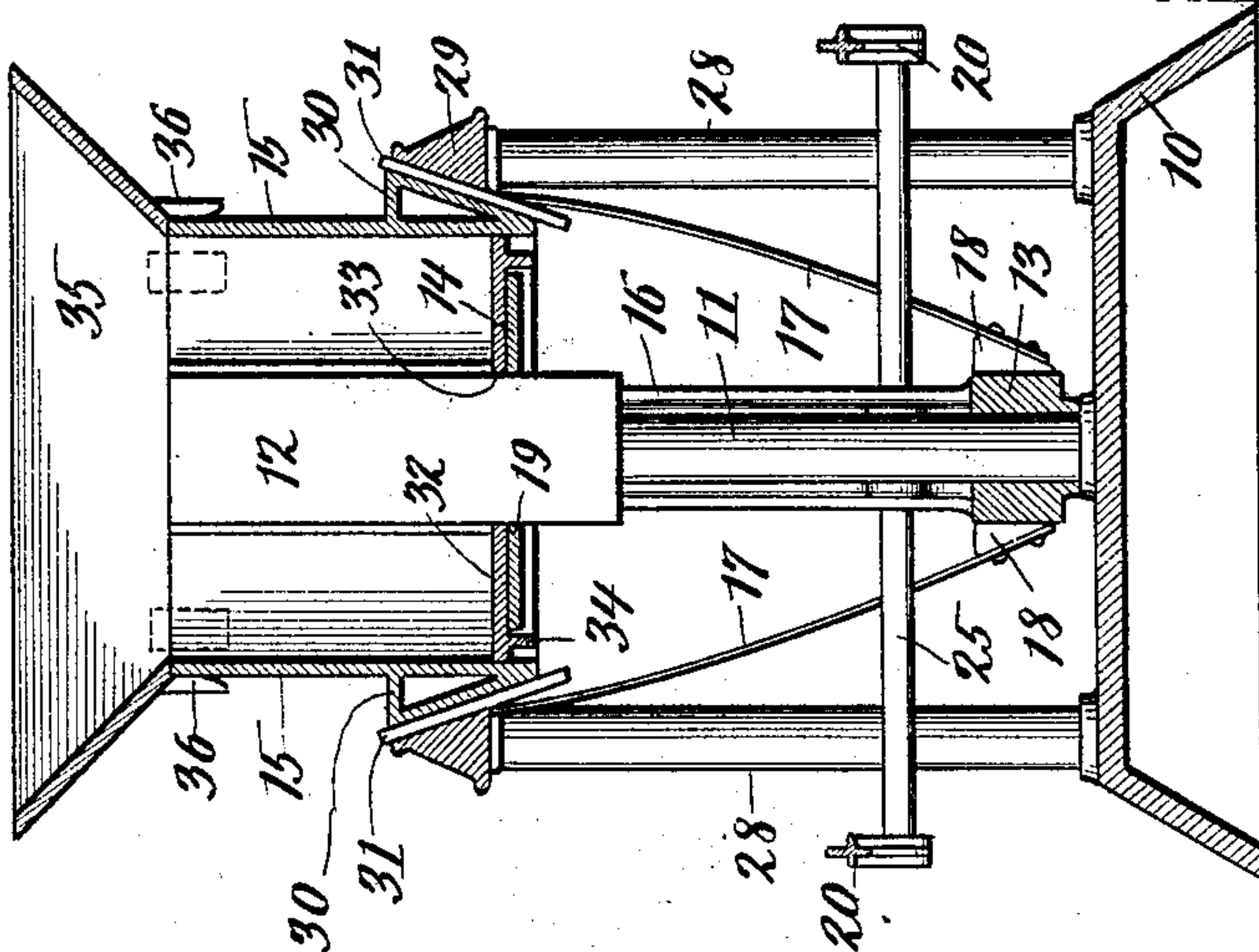
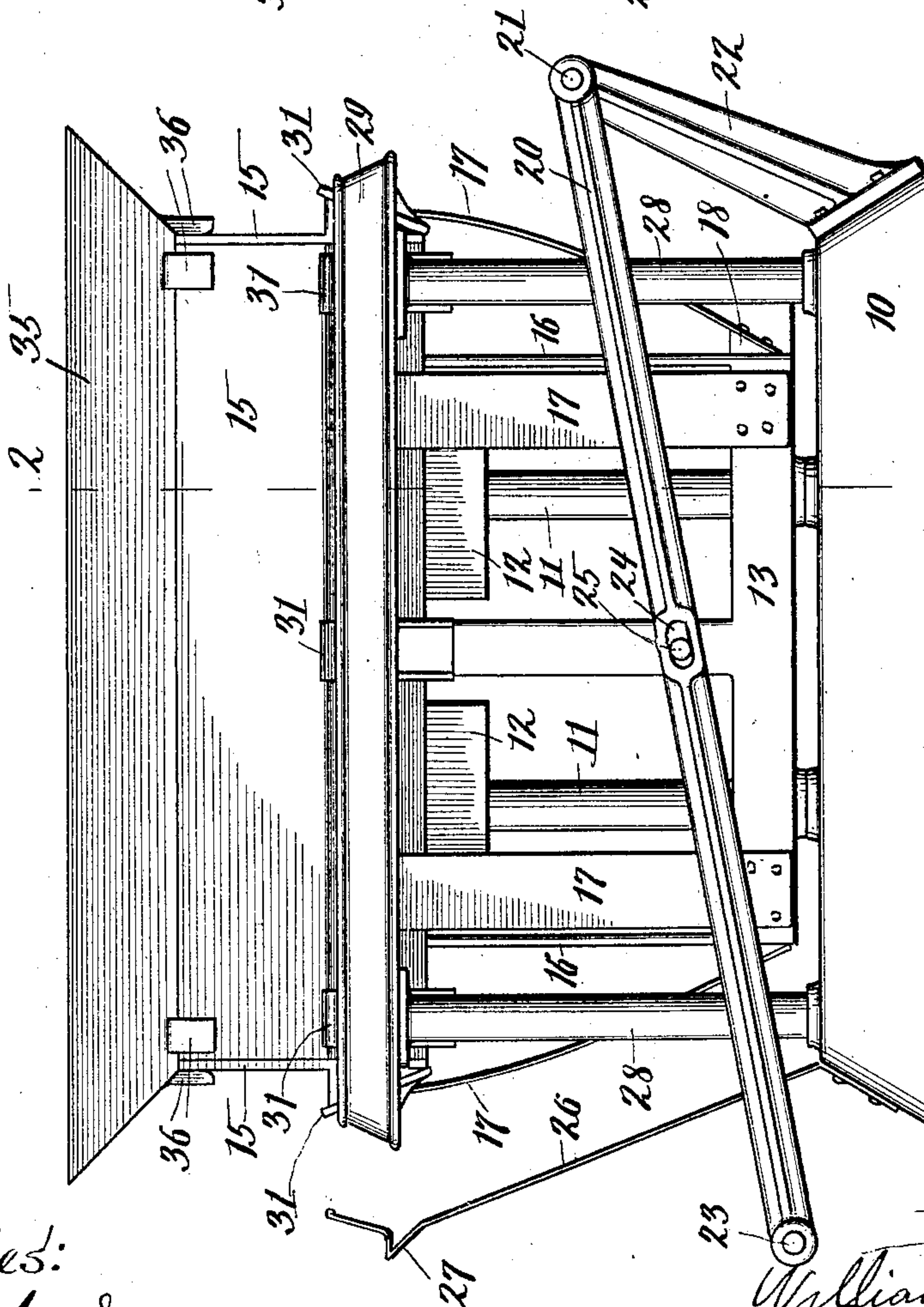


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 4.

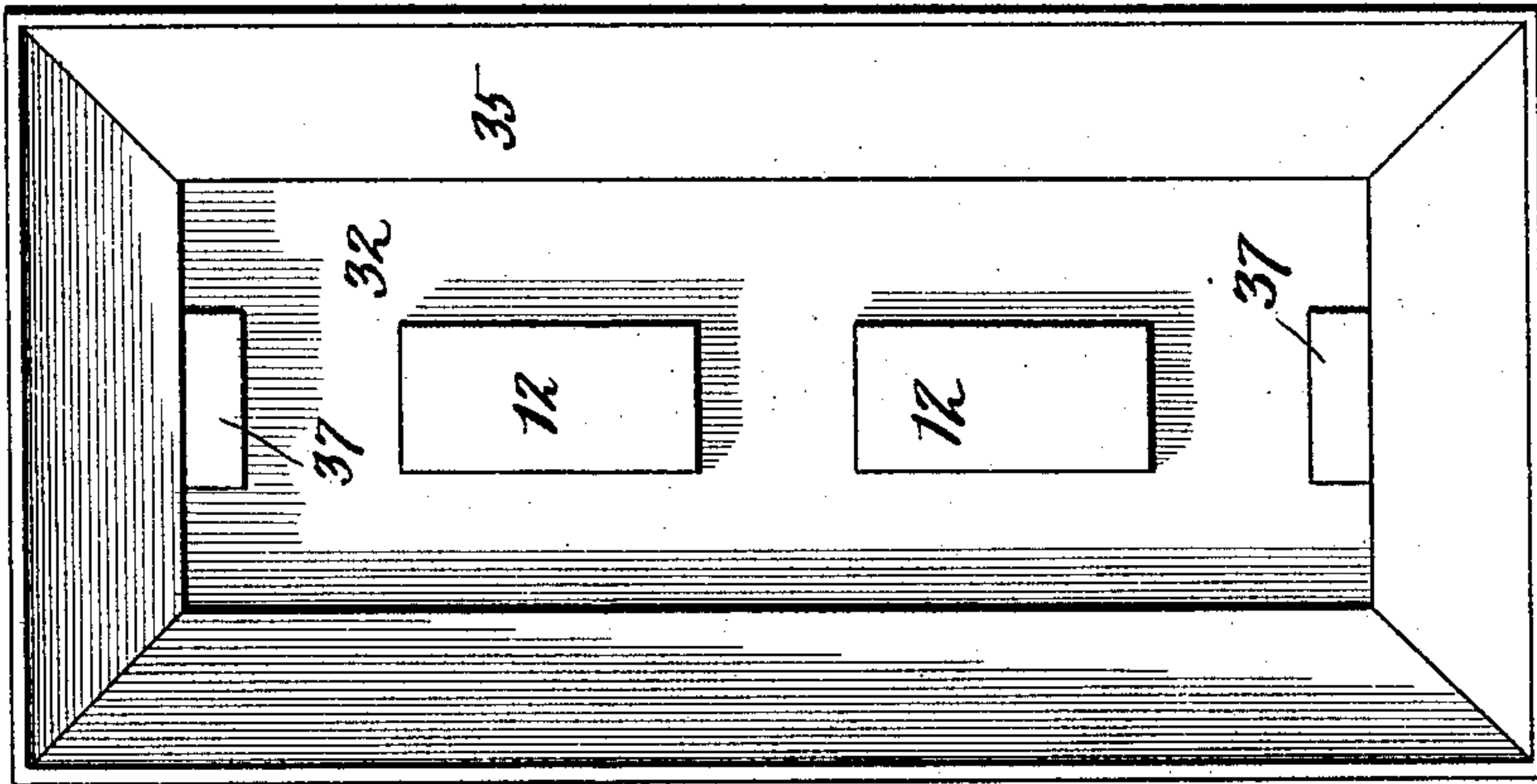
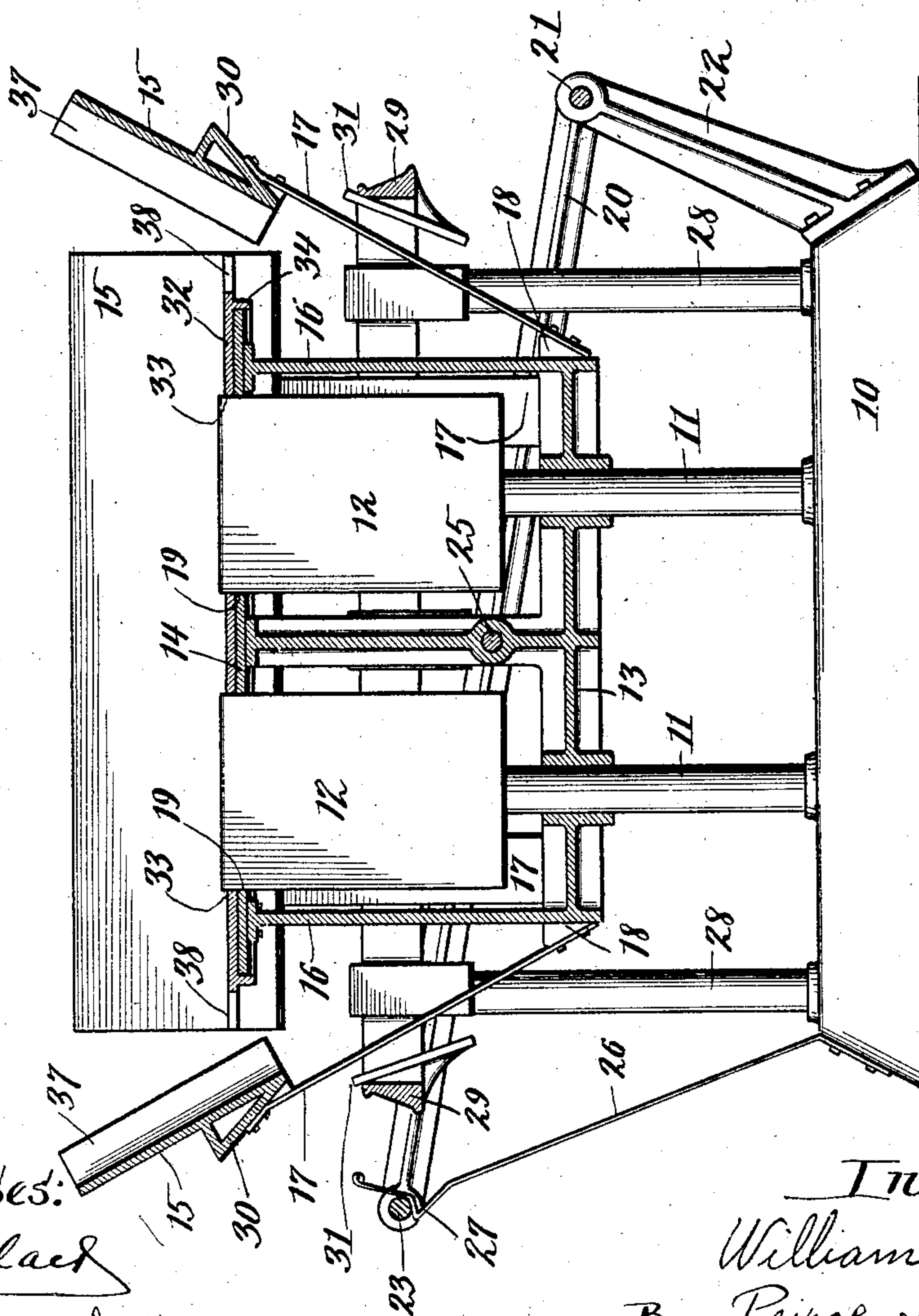


Fig. 3.



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MACHINE FOR FORMING BUILDING-BLOCKS.

SPECIFICATION forming part of Letters Patent No. 763,634, dated June 28, 1904.

Application filed February 4, 1903. Serial No. 141,814. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM RAAB, a citizen of the United States, and a resident of Waterloo, county of Blackhawk, and State of Iowa, have invented certain new and useful Improvements in Machines for Forming Building-Blocks, of which the following is declared to be a full, clear, and exact description.

The invention relates to machines for forming artificial-stone building-blocks from concrete or similar suitable plastic material, and particularly to the type of machine adapted to form hollow building-blocks.

The invention seeks to provide a simple and effective form of machine by which the sides of the block-forming mold may be automatically and quickly opened, and preferably as the parts are moved to withdraw the core from the molded block.

The invention consists in the features of construction and arrangement of parts set forth in the following description, illustrated in the accompanying drawings, and more particularly set forth in the appended claims.

In the drawings, Figure 1 is a side elevation of the improved machine. Fig. 2 is a cross-section on line 2 2 of Fig. 1. Fig. 3 is a longitudinal section, the block-forming mold being in expanded or open position. Fig. 4 is a plan view of the mold and hopper in the position shown in Fig. 1.

Upon the base 10 of the machine are mounted the vertically-disposed core-supports 11, (in the present form two in number,) carrying on their upper ends the cores 12, which are thus preferably fixed in position. One or more of the cores 12 and supports 11 may be employed, as found desirable. The supports 11 are preferably cylindrical in outline, as shown, and mounted to slide upon these supports is a vertically-reciprocating cross-head 13. By providing at least two of the supports 11 and securing them rigidly in position upon the base 10 it will be seen that the cross-head 13 is accurately guided by the supports 11 in right-line direction.

As shown most clearly in Figs. 2 and 4, the mold-box, which preferably reciprocates in vertical direction about the fixed cores 12,

comprises the bottom 14 and the expansible side walls 15. The mold is preferably rectangular in outline, as shown, and its bottom 14 is supported upon the upper ends of a series of uprights 16, which project upwardly from the cross-head 13. Uprights 16 are, as indicated in Fig. 3, preferably formed in piece with the cross-head 13, but, if desired, may be formed separate thereto and bolted securely to the cross-head. Where two cores 12, as in this instance, are employed, the uprights 16 are preferably three in number, as shown, one between the two cores and one outside each of said cores.

Actuating-springs 17 are provided for automatically expanding the side walls 15 of the mold-box. These springs preferably, also, serve to support the side walls of the box and extend between the lower edges of the side walls and the outer portion of the cross-head 13. The upper ends of the springs 17 are securely bolted to the lower portions of the side walls 15, and their lower ends are securely bolted to triangular projections 18 on the outer face of the cross-head 13.

The fixed cores 12 extend through openings 19 in the mold-box bottom 14, and the movement of the cross-head 13 serves to shift the bottom 14 and side walls 15 of the mold-box, which are attached to the cross-head, in vertical direction about the fixed cores 12.

Any suitable shifter may be provided for the cross-head 13. In the form illustrated a pair of shift-arms 20 extend upon either side of the machine and are pivoted at one end upon a shaft 21, the latter being suitably mounted upon the upper end of a rigid upright 22, which is bolted to the base-plate 10. The forward ends of the operating-arms 20 are connected together by a rod 23, so that, in effect, a single bifurcated shift-lever is formed. Each arm 20 of the shifter is slotted, as at 24, near its central portion, and the ends of a transverse rod 25, which is secured to the cross-head 13, engage the slots 24 in the oppositely-disposed arms 20 of the shift-lever. The shift-lever, cross-head 13, and parts operated thereby are preferably locked in their uppermost position by a spring-latch 26, which is

bolted at its lower end to the end of the base-plate 10 and which is provided at its upper end with a shoulder or offset 27, which engages the rod 23 of the shift-lever, as clearly shown in Fig. 3.

A series of uprights 28 project from the base-plate 10 and carry at their upper end an open frame 29, which corresponds to the outline (in this case rectangular) of the mold-box. The frame 29 is somewhat larger than the mold-box and is so placed that when the mold-box is in lowermost position the lower portions of the side walls 15 will pass into the open frame 29. Preferably the side walls 15 of the mold-box are provided at their lower portions with offset portions 30, the outer faces of which are downwardly and inwardly inclined, and the inner face of the frame 29 is preferably provided with a series of correspondingly-inclined shoes 31. It is obvious that when the parts are in lowermost position these inclines upon the side walls of the mold-box and upon the machine-frame will cooperate to move the side walls of the box to upright position, as shown in Figs. 1 and 2, against the tension of the actuating-springs 17; but when the shifter-arms 20 and cross-head 13 are raised to move the mold-box upwardly the side walls 15 will be released and the actuating-spring 17 will operate to automatically expand the same.

The bottom 14 of the mold-box is preferably of somewhat smaller dimensions than the body of the mold, and a removable plate 32 of approximately the same dimensions as the interior of the mold rests upon the mold-box bottom 14. The removable plate 32 is provided with openings 33, which register with the openings 19 in the bottom 14 and through which the cores 12 extend. To accurately position the plate 32 and to prevent its displacement when the mold is expanded, such plate is preferably provided with a depending flange 34, (see Figs. 2 and 3,) which engages the outer edge of the mold-box bottom 14.

A flaring hopper 35 of the same general outline as the body of the mold (in this instance rectangular) is provided with depending lugs 36. When the mold-box is placed in lowermost position and the side walls automatically closed, as described, the hopper is placed upon the upper end of the mold, (see Fig. 2,) and its lugs 36 engage the outer faces of the side walls 15 and hold the side walls against outward movement at this point.

The end side walls 15 (see Figs. 3 and 4) are preferably provided with core-forming blocks 37, and the removable plate 32 is correspondingly notched, as at 38.

In the operation of the machine the shifter-arms 20, together with cross-head 13, are allowed to descend to lowermost position, so that the mold-box moves downwardly over the fixed cores 12, and the cooperating inclines 30 and 31 upon the spring-held sides of the

mold-box and upon the frame of the machine serve to bring the side walls to upright position, as shown in Figs. 1 and 2, and close the mold. The hopper 35 is then placed in position, and the plastic concrete or other suitable material is placed in the mold, being conveniently directed into the open spaces between the cores in the side walls by the open hopper 35. The composition is preferably closely packed within the body of the mold, and during the packing operation the lugs 36 upon the hopper 35 serve to prevent any outward movement of the expansible side walls 15. When the mold has been filled, the hopper 35 is removed. The cross-head 13 and parts carried thereby are lifted to uppermost position by the shifter-arms 20 and are locked in such position by the spring-latch 26. As the mold-box is lifted by the cross-head 13 the cores 12 are removed from the body of the completed mold and the side walls 15 are released, so that the actuating-spring 17 may automatically expand or move the side walls outwardly to open the mold, leaving the completed block upon the upper face of the removable plate 32. By means of lift-hooks or any other suitable manner the removable plate 32 may be removed, carrying with it the completed block, and when a similar removable plate is placed upon the bottom of the mold-box the machine is ready for the next operation. The cores 12 are preferably slightly tapering, so that their removal from the completed block may be readily effected.

The invention provides a simple and effective machine by which the sides of the mold are automatically expanded and the cores quickly removed from the body of the molded block without necessitating the employment of complicated connecting mechanism.

The features of construction may be obviously widely varied by the skill of the mechanic without departure from the essentials of the invention.

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

1. In a machine for forming hollow building-blocks, the combination of a mold-box comprising a bottom wall, and expansible side walls, abutments arranged to hold said side walls in closed position, a core arranged to extend through an opening in said bottom wall when said side walls are held in closed position, a shifter arranged to effect a relative movement between said mold and core to simultaneously release said side walls and remove the core from the molded block, and springs extending between said shifter and said side walls for automatically expanding said walls.

2. In a machine for forming hollow building-blocks, the combination of a reciprocating mold comprising a bottom wall and outwardly-expansible side walls, said bottom and side

walls being connected to shift together, a core arranged to extend through an opening in said bottom wall, abutments arranged to retain said side walls in closed position when the mold is moved to position said core within the same, a common shifter for said bottom and side walls arranged to simultaneously effect the removal of the core from the molded block and release said spring-actuated side walls from said abutments, and springs extending between said shifter and said side walls for automatically expanding said walls.

3. In a machine for forming hollow building-blocks, the combination of a vertically-reciprocating mold-box comprising a bottom wall and expansible side walls, said bottom and side walls being connected together for simultaneous shift, a stationary core vertically extending through an opening in the mold-box bottom, stationary abutments arranged to engage said side walls and hold the same in closed position, a vertically-reciprocating cross-head, guides for said cross-head, connections between said cross-head and the mold-box bottom, springs extending between said cross-head and said side walls for automatically expanding said walls and a shifter for said cross-head.

4. A machine for forming building-blocks comprising a vertically-reciprocating mold-box having expanding side walls, a reciprocating cross-head connected to the mold-box bottom, supporting and actuating springs for said side walls extending between the latter and said cross-head, means on the machine-frame for holding said side walls in closed position against the tension of said springs when the mold-box is in its lowermost position and a shifter for said cross-head.

5. A machine for forming hollow building-blocks comprising a vertically-reciprocating mold-box having expanding side walls, a fixed core extending through an opening in the mold-box bottom, a vertically-reciprocating cross-head connected to the mold-box bottom, supporting and actuating springs for the side walls extending between the latter and said cross-head, means on the machine-frame for holding said side walls in closed position against the tension of said springs when the mold-box is at the lower end of its movement and a shifter for said cross-head.

6. A machine for forming hollow building-blocks comprising a vertically-reciprocating mold-box having expanding side walls, cores extending through openings in the mold-box bottom, vertically-disposed supports for said cores, a cross-head mounted to slide on said vertical supports and connected to the mold-box bottom, actuating-springs for said side walls extending between the latter and said cross-head and a shift-lever for said cross-head.

7. A machine for forming building-blocks,

the combination with a stationary machine-frame, of a vertically-reciprocating mold-box comprising a bottom wall and expansible side walls, said side and bottom walls being connected for simultaneous shift and said side walls being arranged to swing about centers below said bottom wall, cooperating abutments on the stationary machine-frame and on said side walls for holding the latter in closed position when the mold-box is at the lower end of its movement, a core arranged to project through an opening in said bottom wall when said mold-box is in its lowermost closed position, means for vertically shifting said mold-box to simultaneously release said spring-actuated side walls and effect the removal of the core from the molded block, and springs extending between said shifting means in said side walls for automatically expanding said walls.

8. A machine for forming building-blocks, the combination with a stationary machine-frame, of a vertically-reciprocating mold-box comprising a bottom wall and expansible side walls, said side and bottom walls being arranged to swing about centers below said bottom wall, cooperating inclines fixed on the stationary machine-frame and on said side walls for holding the latter in closed position when the mold-box is at the lower end of its movement, a core arranged to project through an opening in said bottom wall when the mold-box is in its lowermost closed position, means for shifting said mold-box to simultaneously release said spring-actuated side walls and effect the removal of the core from the molded block, and springs extending between said shifting means and said side walls for automatically expanding said walls.

9. A machine for forming hollow building-blocks comprising a vertically-reciprocating mold-box having expanding side walls, fixed cores extending through openings in the mold-box bottom, vertical supports for said cores, a reciprocating cross-head guided on said supports and connected to a mold-box bottom, supporting and actuating springs for the side walls extending between the latter and said cross-head, cooperating inclines on the machine-frame and on said side walls for closing the mold when the latter is in its lowermost position and a shift-lever for said cross-head.

10. In a machine for forming hollow building-blocks, a vertically-reciprocating mold-box comprising a bottom wall and expansible side walls, said bottom and side walls being connected for simultaneous shift, a core arranged to extend vertically through an opening in said bottom walls when in lowermost position, a frame surrounding said core arranged to engage and hold said side walls in closed position, a common shifter for said bottom and side walls arranged to raise said side walls above said frame and said bottom walls

to the top of said core and springs extending between said shifter and said side walls for automatically expanding said walls.

11. In a machine for forming hollow building-blocks, a vertically-reciprocating, non-rotatable mold-box comprising a bottom wall and expansible side walls, said bottom and side walls being connected together for simultaneous shift, a fixed core arranged to extend through an opening in said bottom wall when in lowermost position, a fixed frame arranged to engage said side walls and hold them in closed position when said mold-box is at the lower end of its movement, a common shifter arranged to raise said side walls above said frame and to lift said bottom wall to the top of said core and springs extending between said shifter and said side walls for automatically expanding the same.

12. In a machine for forming hollow building-blocks, a vertically-reciprocating mold-box comprising a bottom wall and expansible side walls, said bottom and side walls being connected together for simultaneous shift, actuating-springs connected to said side walls for automatically expanding the same, abutments fixed on the machine-frame arranged to engage said side walls and hold the same in closed position when the mold-box is at the lower end of its movement, a core arranged

to extend vertically through an opening in said bottom wall when said mold-box is in its lowermost closed position and a common shifter for said side and bottom walls arranged to release said spring-actuated side walls by an initial movement and on its complete movement to raise said bottom wall to the top of said core.

13. In a machine for forming hollow building-blocks, a vertically-reciprocating mold-box comprising a bottom wall and expansible side walls, said bottom and side walls being connected together for simultaneous shift, abutments arranged to engage the outer faces of said side walls and hold them in closed position when the mold-box is at the lower end of its movement, a core arranged to extend vertically through an opening in said bottom wall to the top of the mold when the latter is in its lowermost closed position, a shiftable member for raising said bottom wall to the top of said core and for simultaneously raising said side walls above said abutments and springs extending between said shiftable member and said side walls for automatically expanding the same.

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