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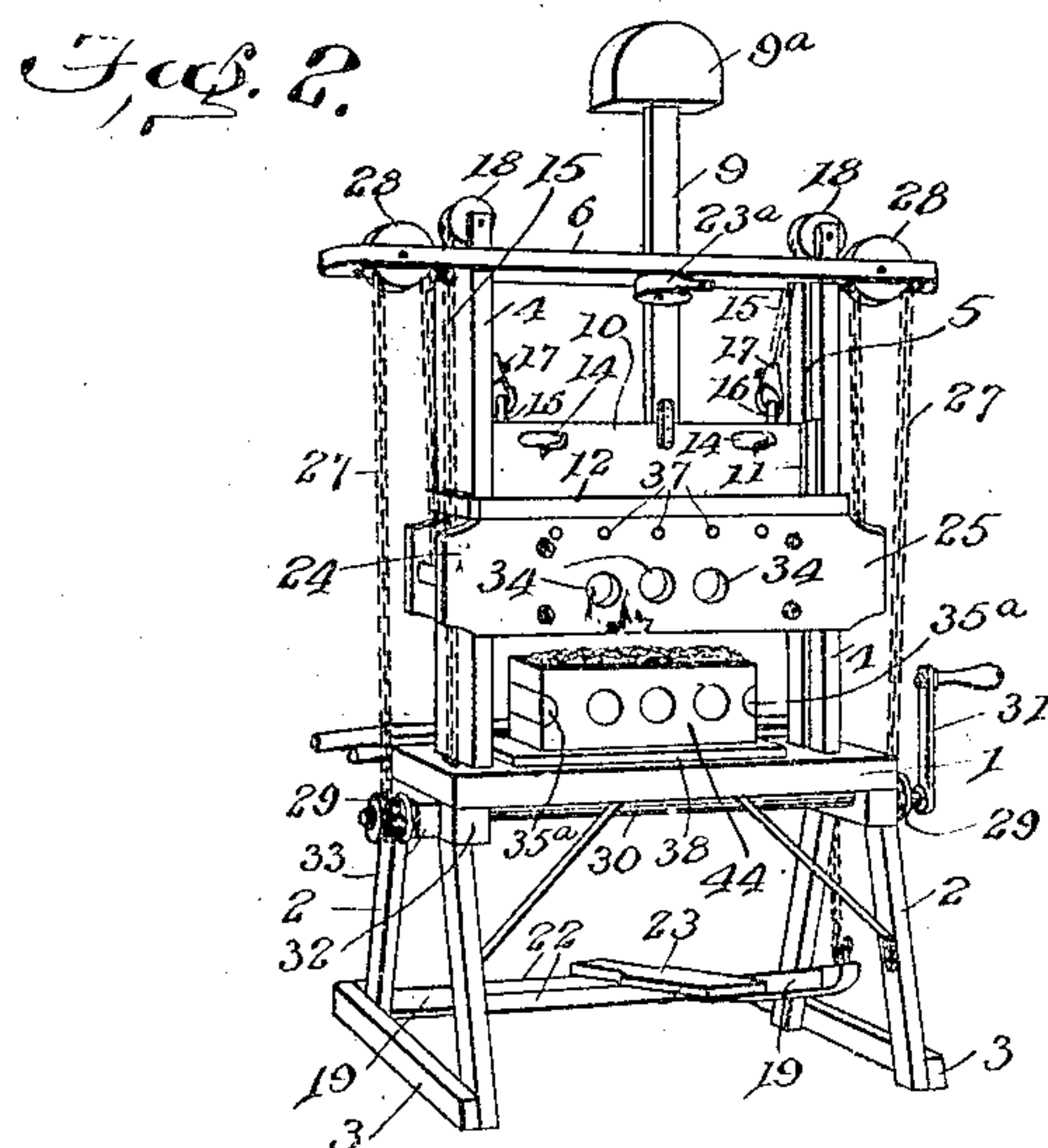
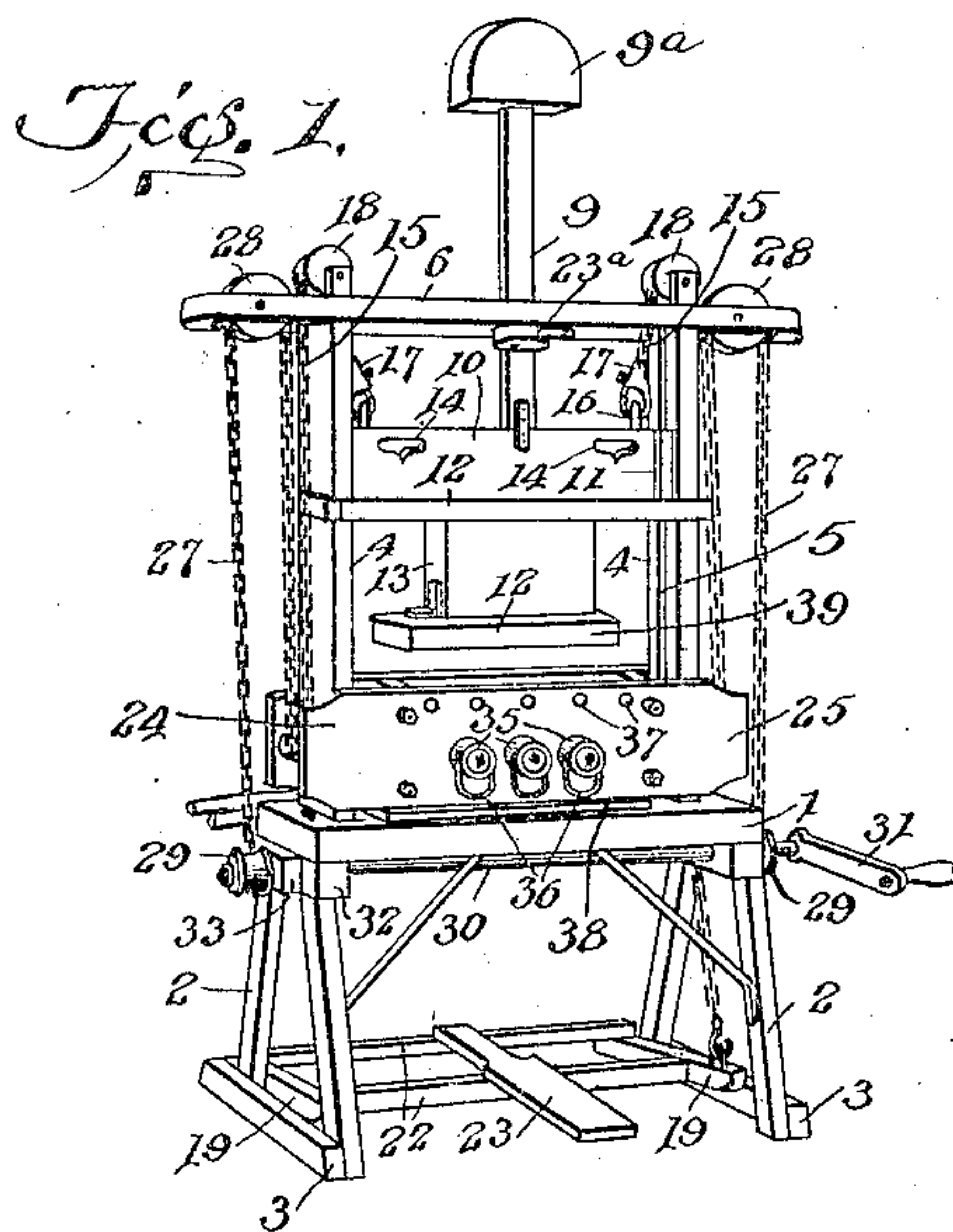
PATENTED NOV. 28, 1905.

J. HORR.

MACHINE FOR MAKING CEMENT OR CONCRETE BLOCKS.

APPLICATION FILED JUNE 8, 1905.

3 SHEETS—SHEET 1.



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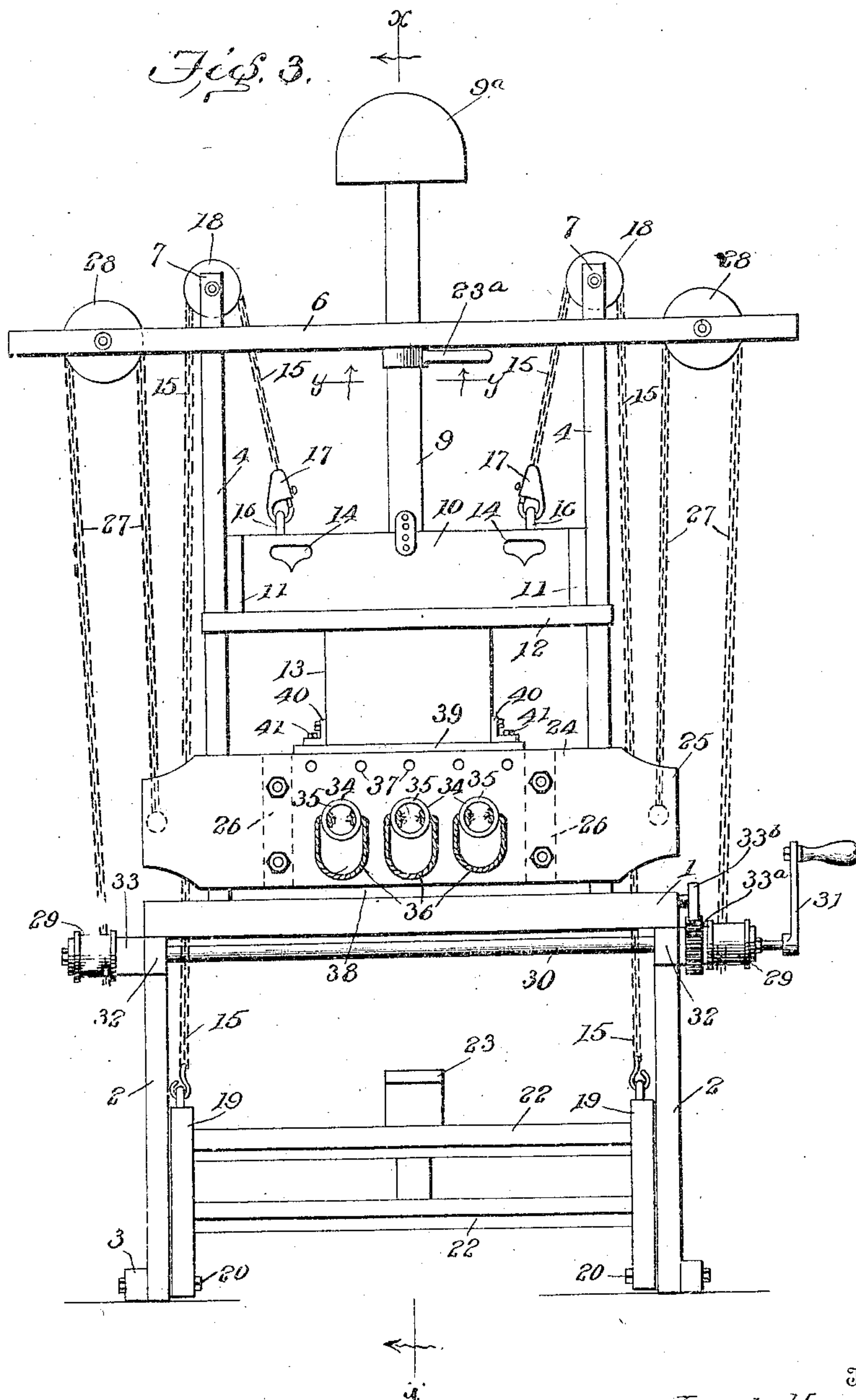
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 4.

Fig. 5.

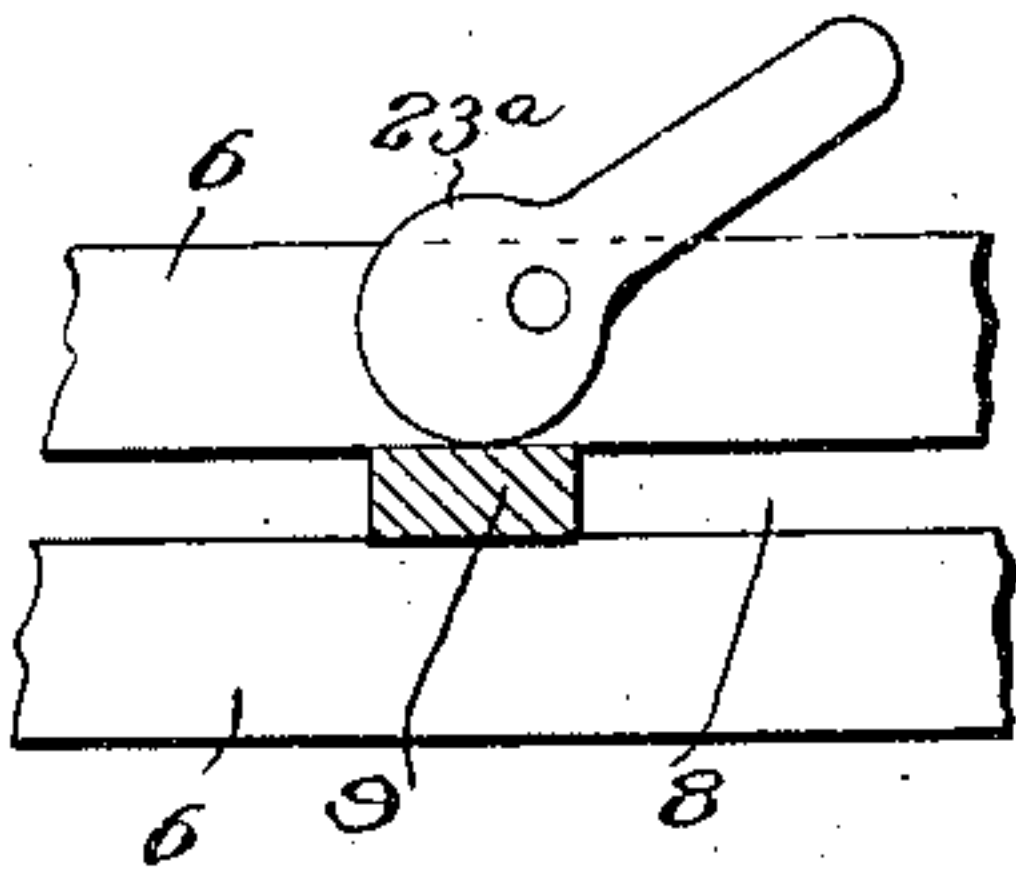
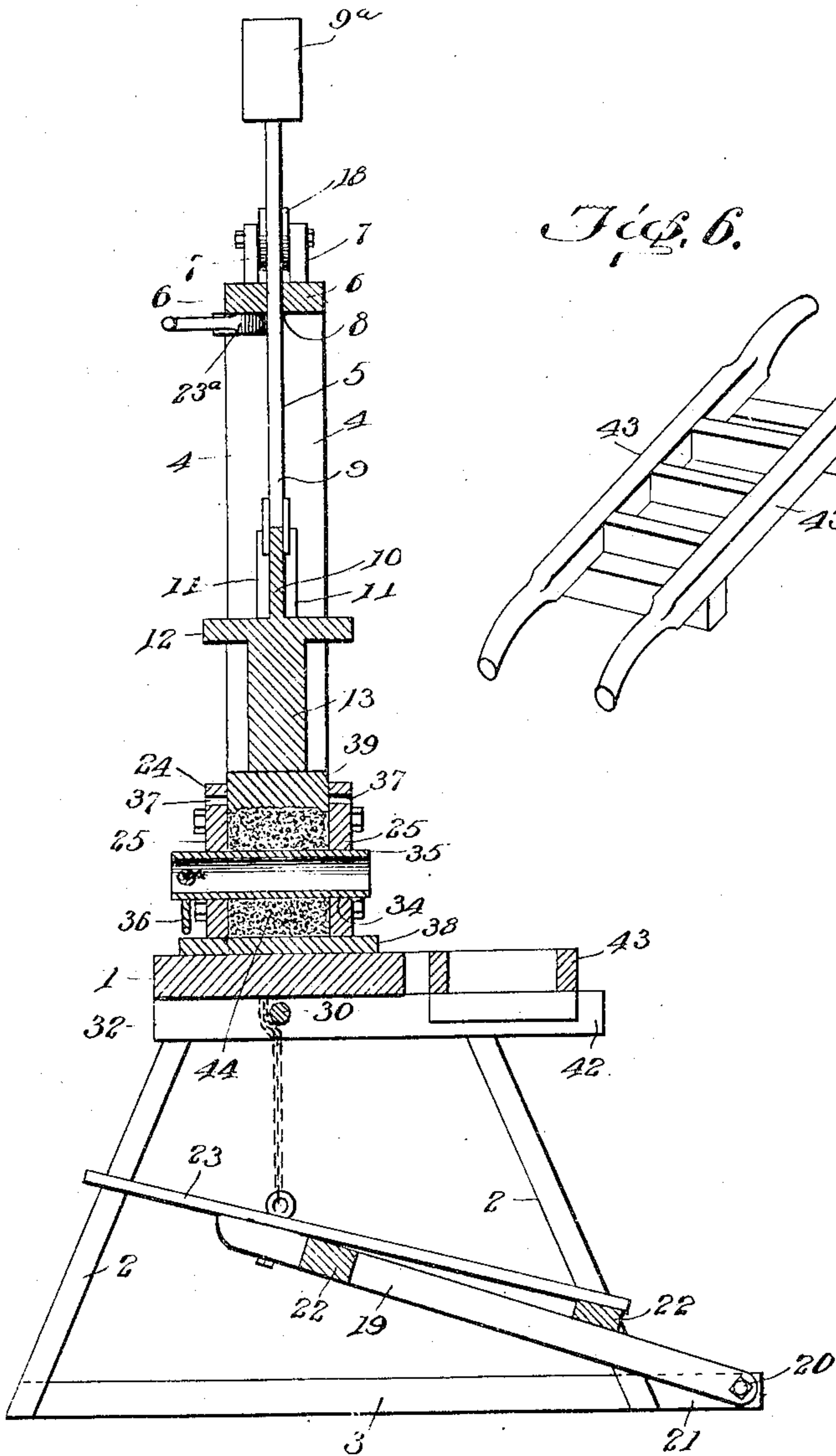
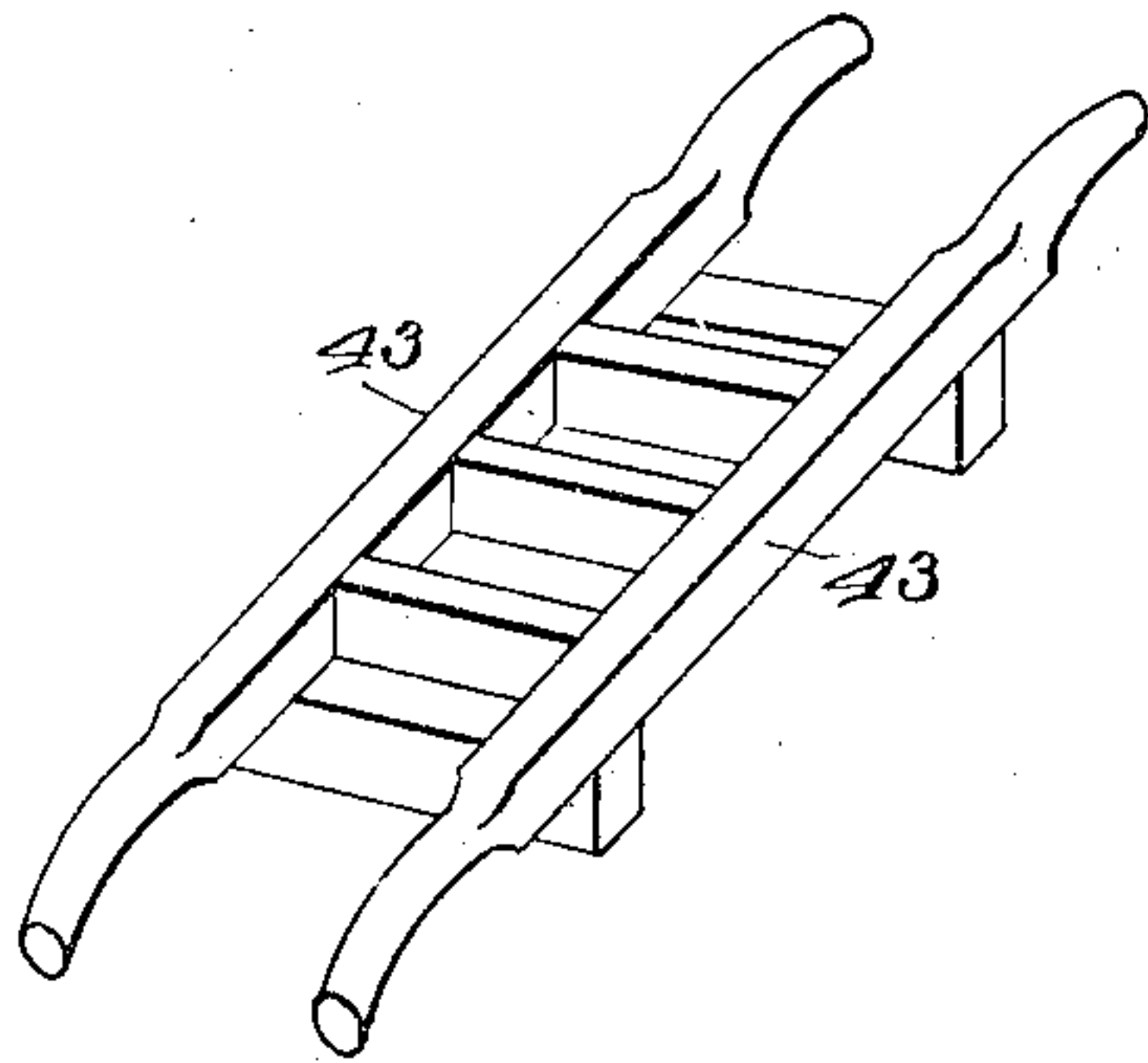


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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## MACHINE FOR MAKING CEMENT OR CONCRETE BLOCKS.

No. 805,914.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed June 8, 1905. Serial No. 264,214.

*To all whom it may concern:*

Be it known that I, JACOB HERR, a citizen of the United States, residing at Mechanicsburg, in the county of Champaign and State of Ohio, have invented certain new and useful Improvements in Machines for Making Cement or Concrete Blocks, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to machines for making cement or concrete blocks, and has for its object to provide a simple and efficient apparatus whereby blocks of concrete, cement, or cementitious material may be readily and inexpensively produced, such blocks being compact, homogeneous, and free from flaws or cavities and having, if desired, one or more of their faces molded in ornamental relief to imitate rough-dressed stone or otherwise.

To these ends my invention consists in certain novel features which I will now proceed to describe and will then particularly point out in the claims.

In the accompanying drawings, Figure 1 is a perspective view showing a machine embodying my invention in one form, the position of the parts being that which they assume during the operation of tamping the concrete. Fig. 2 is a similar view showing the apparatus in the position which the parts assume after the operation of forming the block is completed and just prior to the removal of the block from the machine. Fig. 3 is a front elevation showing the position of the parts after the operation of tamping is completed, but before the stripping of the block from the mold. Fig. 4 is a vertical sectional view taken on the line *xx* of Fig. 3 and looking in the direction of the arrows. Fig. 5 is a detail view, being an inverted plan section taken on the line *yy* of Fig. 3 and looking in the direction of the arrows; and Fig. 6 is a detail view of the hand-barrow.

In the said drawings, 1 represents a suitable table or support mounted on a frame comprising legs 2 and bottom cross-pieces 3 and top cross-pieces 32, connecting said legs in pairs at each side, by means of which frame it is supported at the desired height.

From the table 1, near each end thereof, arise uprights 4, arranged in pairs with a groove or opening 5 between them, so that said uprights constitute guideways for the tamping-plunger and mold-body. These uprights are connected near their upper ends by cross-

pieces 6, the upper ends of the uprights being reduced to form tenons which extend upward through and beyond the cross-pieces 6, as indicated at 7, this reduction of the ends of the uprights forming shoulders on which the cross-pieces rest. The cross-pieces 6 are two parallel pieces, separated by a space or opening 8, which serves to guide the stem of the tamping-plunger. This stem (indicated by the reference-numeral 9) passes up through the guiding-space 8 and may be provided with a weight 9<sup>a</sup> at its upper end to give the stroke of the plunger the desired force. The tamping-plunger comprises, in addition to the stem 9, a cross-head 10, to which the lower end of the stem is attached, the ends of said cross-head extending into the grooves or spaces 5 between the guiding-uprights 4, so that the cross-head is guided against lateral displacement, said cross-head also having guide-block 11 secured on both sides of it at each end and bearing against the inner faces of the uprights 4 to guide the cross-head against displacement in the direction of its length. The cross-head further comprises a stop 12, which may be in the form of a board or plate, secured to the under side of the vertical body of the cross-head 10, apertured for the passage of the uprights 4 and having a width greater than the interior width of the mold-body.

13 indicates the head proper of the tamping-plunger, which is secured to the under side of the stop 12 and is of dimensions such as to adapt it to enter the mold-body. The tamping-plunger is freely movable vertically in the guideways provided for it, and for convenience in so moving it by hand the vertical body of the cross-head may be provided with hand-holes 14. In the practical operation of the plunger, however, it is operated by means of a treadle mounted in the lower portion of the machine. To this end there are connected to the cross-head chains or other flexible connections 15, said connection being preferably effected by eyes 16 on the cross-head and hooks 17 on the ends of the chains. These chains pass up through the space 8 between the cross-pieces 6 and over pulleys 18, which are mounted between the upper ends 7 of the uprights 4. Said chains pass thence downward through the table 1, near each end thereof, and are connected to the free ends of bars 19, forming part of the treadle-frame. These bars are pivoted at their rear ends on bolts 20, which pass through the rear ends of the



cross-pieces 3 and through extensions 21 of the legs 2. The bars 19 are connected by cross-bars 22, which support a central foot-piece or treadle proper, 23, extending to the front of the machine. It will be seen that when the treadle 23 is depressed the tamping-plunger will be lifted, and when said treadle is released the plunger will descend by gravity, the force of the blows delivered being regulated by the foot of the operator upon the treadle.

I provide means for locking the tamping-plunger positively against vertical movement in either direction at any point of its range of movement, and to this end there is pivoted to one of the cross-pieces 6 a cam-lever 23<sup>a</sup>, having an eccentric or cam-shaped head which may be brought to bear against the side of the plunger-stem 5 and clamp the same against the other cross-piece 6, said locking-lever being readily disengaged to permit free movement of the plunger when desired. This construction is shown in detail in Fig. 5.

24 indicates as a whole the mold-body, comprising side pieces 25 and end pieces 26, these latter being indicated in dotted lines in Fig. 3. These side and end pieces are in permanent relation to each other while the machine is in operation, the mold thus being a permanent or fixed mold, as contradistinguished from a knockdown mold, or one in which the sides and ends are hinged or otherwise relatively movable to permit the removal of the finished block. The mold-body embraces at its ends the upright guides 4 and is thus positioned thereby relatively to the tamping-plunger and guided in its vertical movements, said mold-body being free to move vertically on said guides. This vertical movement of the mold-body is effected by means of chains or other flexible connections 27, connected at one end to the respective ends of the mold-body and passing thence upward through the space 8 between the cross-pieces 6 and around pulleys 28, mounted between said cross-pieces, which are extended laterally beyond the uprights 4 to receive and support said pulleys. The chains pass thence downward and are connected to drums 29, secured on a shaft 30, mounted in the frame and provided with a crank-handle 31, by means of which said shaft may be rotated. The top cross-pieces 32 of the table-supporting frame carry bearing-blocks 33, in which the shaft 30 is mounted. By turning the crank 31 in one direction or the other the mold-body 25 may be raised or lowered, as desired. The mold-body may be held in elevated position by any suitable means—as, for instance, a ratchet-wheel 33<sup>a</sup>, secured on the shaft 30, with which co-operates a pawl 33<sup>b</sup>, mounted on a fixed part—as, for instance, the bearing-block 33. The mold-body is provided in its side pieces 26 with apertures 34 to receive removable core-pieces 35, which extend transversely across the cavity

of the mold and through the apertures 34. These core-pieces may be of any suitable construction and I prefer the tubular form shown, the same being provided at one end with a handle 36, preferably in the form of a gromet or loop of rope or cord connected to the projecting end of each core-piece. The mold-body is also provided near its upper portion, at a point about on a level with or slightly above the upper face of the completed block, with vent-apertures 37, through which the air may escape from under the tamping-plunger. The bottom of the mold is formed by a board or plate 38, which may rest loosely on the table 1 and which is of larger dimensions than the mold-cavity, so that the mold-body rests on top of said bottom board or plate. The top of the mold is formed by a plate 39, which is secured to the lower end of the plunger-head 13, its connection being preferably a detachable one so that various top plates may be employed. This top plate is of a size such as to permit it to enter and fit within the mold-body while being also capable of free vertical motion therein. The under surface of said top plate is preferably provided with a pattern such as it is desired to reproduce in relief or otherwise on the upper surface of the finished block. The connection between the top plate and plunger-head is preferably a detachable one, so that by providing a number of plates having different patterns thereon the ornamentation of the upper face of the block may be varied, as desired. In the present instance I have shown this connection as effected by angle-pieces 40, secured to the ends of the head 13 and connected to the top plate by screws 41, so as to permit the removal and replacement of the top plate; but the connection may be any suitable separable one. Where it is desired to form the block ornamented on its two opposite faces, the bottom plate or board 38 may also be provided with a suitable pattern on its upper surface.

Although the side and end pieces of the mold are in permanent relation to each other during the operation of the machine, the end pieces may be adjustable toward and from each other to vary the length of the block, and in this case top plates of different lengths will be provided to conform to the differences in length of the mold-cavities.

The cross-pieces 32 of the supporting-frame are extended out beyond the table 1, such extension being made in either direction, but being shown in the present instance as toward the rear, as indicated at 42. These extensions 42 serve as a support for a hand-barrow 43, which may rest loosely thereon, the same being shown in detail in Fig. 6, the construction being such that when said barrow rests upon the supporting extensions its top is on a level with or slightly below the top of the table 1.

The machine thus constructed operates in



the following manner: The tamping-plunger being raised and locked by means of the locking device for that purpose the bottom board 38 is placed upon the table 1 and the mold-body is lowered so as to rest on the same. The mold-body is then partially filled with the concrete or other material of which the block is to be composed, the tamping-plunger being unlocked and reciprocated vertically by means of the treadle, so as to tamp the material in the lower part of the mold and firmly consolidate the same so as to make it compact and homogeneous. This process is continued until the mold is filled to the level of the lower edges of the core-apertures 34, whereupon the core-pieces 35 are inserted through said apertures into the mold-body in the position shown in Figs. 1, 3, and 4 of the drawings. If desired, half-cores in the form of semicylindrical blocks, such as are shown at 35<sup>a</sup> in Fig. 2, may be placed at the ends of the mold at this time if it is desired to produce blocks having matching semicylindrical grooves or recesses at their ends, as is sometimes the case. Otherwise these half-cores may be omitted. The spaces between the core-pieces are then filled with the composition and the filling and tamping proceeds, as before, until the mold is filled to the proper height with material properly tamped and compacted. The tamping-plunger is then released, so that it rests upon the top of the block with the top plate 39 in contact with the top surface thereof. During the tamping operations the air in the mold-body below the descending plunger escapes through the openings 37 and 34 until these latter openings are closed by the core-pieces, whereupon the openings 37 provide an escape for the air. After the plunger has been lowered upon the top of the block after the manner just described it is locked in said position by means of the locking-lever 23<sup>a</sup>. The core-pieces 35 are then withdrawn by means of the handle 36, provided for that purpose, whereupon the mold-body 24 is free to be lifted clear of the finished block 44. This is accomplished by rotating the shaft 30 in the proper direction by means of the crank-handle 31, whereupon the mold-body will be moved upward by the chains 27, the plunger and its top plate acting as a stripper-plate to prevent the block from moving upward with the mold-body. This upward movement of the mold-body is continued until the mold comes in contact with the stop 12, the combined vertical height of the head 13 and top plate 39 being somewhat greater than the total vertical depth of the mold-body, so that said mold-body passes upward clear of the block before it strikes the stop. During this portion of the operation the immovability of the plunger is of the highest importance, since if it were free to move downward after the mold-body is cleared of the block the block being laterally unsupported would be crushed

or broken or pressed out of shape by the weight of the plunger. This result is prevented by locking of the plunger against vertical movement in the manner described. When the mold-body in its upward movement has come into contact with the stop 12, the plunger is unlocked by releasing the grip of the locking-lever 23<sup>a</sup> on the plunger-stem, whereupon as the upward movement of the mold-body continues both mold-body and plunger are further lifted until they assume the position shown in Fig. 2. The parts are then locked or held in this elevated position during the removal of the block from the machine. This removal is accomplished by placing the hand-barrow 43 on the supporting extensions 42, whereupon the bottom plate or board 35, with the block resting thereon, can be slid over onto said barrow, the transfer being facilitated by the fact that the top of the barrow is on a level with or slightly below the top of the table 1, as already stated. By means of the barrow the block and bottom board may be readily carried to a suitable place of deposit, where the block may be slid onto a suitable support or rest, either along with or independently of the bottom board. In the former case a plurality of bottom boards are employed, another bottom board being placed on the table 1, while in the latter case the bottom board originally used is returned to the table, the mold-body being lowered thereon, and the operation proceeds as before.

It will be seen that by means of this apparatus compact blocks can be rapidly and cheaply produced, the necessary tamping being effected by foot-power, leaving the operator the free use of his hands and the operation of getting the block out of the mold being rapidly and easily performed without any danger of crushing or deforming the block, which is left in a position where it can be readily disposed of to make way for another.

The apparatus is simple, inexpensive, and efficient, and readily operated.

I have shown and described a machine for the formation of concrete or cement blocks, being relatively large masses used as substitutes for building-stone; but it is obvious that the invention is applicable to the manufacture of cement blocks of various sizes and shapes—such as are known, for instance, as "bricks"—and in this latter case a plurality of molds and plungers may be employed, or a single mold may be subdivided by transverse partitions into compartments of the desired size, the tamping-plunger being similarly subdivided or a plurality of such plungers being employed. Where it is desired to ornament the ends of the block, false end pieces may be placed within the mold against the end pieces 26, said false end pieces having the desired patterns on their inner surfaces and fitting loosely in the mold, the top plate extending



over them, so that when the mold-body is lifted to strip the block the top plate will hold the false end pieces in position against the block, from which they can be removed after the block is clear of the mold.

Various other modifications may be made without departing from the principle of my invention, and I therefore do not wish to be understood as limiting myself strictly to the precise details of construction hereinbefore described, and shown in the accompanying drawings.

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

1. A machine for making cement blocks, comprising a supporting-table provided with vertical guideways, a permanent mold-body mounted on said guideways, means for raising and lowering said mold-body and holding it in a raised position, a tamping-plunger vertically movable in said guideways and provided with a top plate adapted to enter and fit the mold-body, means for reciprocating said tamping-plunger, and means for locking said tamping-plunger against vertical movement in either direction at different points of its path, substantially as described.

2. A machine for making cement blocks, comprising a supporting-table provided with vertical guideways, a permanent mold-body mounted on said guideways, means for raising and lowering said mold-body and holding it in a raised position, a tamping-plunger vertically movable in said guideways and provided with a top plate adapted to enter and fit the mold-body, said top plate having a pattern on its under side, means for reciprocating said tamping-plunger, and means for locking said tamping-plunger against vertical movement in either direction at different points of its path, substantially as described.

3. A machine for making cement blocks, comprising a supporting-table provided with vertical guideways, a permanent mold-body mounted on said guideways, means for raising and lowering said mold-body and holding it in a raised position, a tamping-plunger vertically movable in said guideways, a top plate detachably connected to said tamping-plunger and adapted to enter and fit the mold-body, means for reciprocating said tamping-plunger, and means for locking said tamping-plunger against vertical movement in either direction at different points of its path, substantially as described.

4. A machine for making cement blocks, comprising a supporting-table provided with vertical guideways, a permanent mold-body mounted on said guideways, means for raising and lowering said mold-body and holding it in a raised position, a tamping-plunger vertically movable in said guideways and provided with a top plate adapted to enter and fit the mold-body, means for reciprocating

said tamping-plunger, and means for locking said tamping-plunger against vertical movement in either direction with its top plate in contact with the finished block within the mold, and for holding said plunger in a raised position, substantially as described.

5. A machine for making cement blocks, comprising a supporting-table provided with vertical guideways, a permanent mold-body mounted on said guideways, means for raising and lowering said mold-body and holding it in a raised position, a removable bottom board or plate interposed between said mold-body and supporting-table, a tamping-plunger vertically movable in said guideways and provided with a top plate adapted to enter and fit the mold-body, means for reciprocating said tamping-plunger, and means for locking said tamping-plunger against vertical movement in either direction at different points of its path, substantially as described.

6. A machine for making cement blocks, comprising a supporting-table provided with vertical guideways, a permanent mold-body mounted on said guideways, means for raising and lowering said mold-body and holding it in a raised position, a tamping-plunger vertically movable in said guideways and provided with a top plate adapted to enter and fit the mold-body, means for reciprocating said tamping-plunger, means for locking said tamping-plunger against vertical movement in either direction at different points of its path, and a stop carried by said plunger and arranged to be engaged by the mold-body after said mold-body has cleared the block in its upward movement, substantially as described.

7. A machine for making cement blocks, comprising a supporting-table provided with vertical guideways, a permanent mold-body mounted on said guideways, means for raising and lowering said mold-body and holding it in a raised position, said means comprising a crank-shaft supported below the table, pulleys supported on the guideways, and flexible connections between said mold-body and crank-shaft passing around said pulleys, a tamping-plunger vertically movable in said guideways and provided with a top plate adapted to enter and fit the mold-body, means for reciprocating said tamping-plunger, and means for locking said tamping-plunger against vertical movement in either direction at different points of its path, substantially as described.

8. A machine for making cement blocks, comprising a supporting-table provided with vertical guideways, a permanent mold-body mounted on said guideways, means for raising and lowering said mold-body and holding it in a raised position, a tamping-plunger vertically movable in said guideways and provided with a top plate adapted to enter and fit the mold-body, and means for reciprocating said tamping-plunger, comprising a treadle located below the table, pulleys mounted on



the guideways, and flexible connections between said treadle and plunger passing over said pulleys, substantially as described.

5 9. A machine for making cement blocks, comprising a supporting-table provided with vertical guideways, and cross-pieces connecting said guideways, a permanent mold-body mounted on said guideways and provided with means for raising and lowering the same, a  
10 tamping-plunger vertically movable in said guideways and having a stem extending upward between the cross-pieces, means for reciprocating said plunger, and means for locking said plunger against vertical movement,  
15 comprising a locking-lever pivotally mounted on one of said cross-pieces and having a cam-shaped or eccentric head adapted to engage the plunger-stem and clamp the same against the other cross-piece, substantially as described.  
20

10. In a machine for making cement blocks, the combination, with a vertically-movable mold-body and reciprocating tamping-plunger, of a table provided with guideways for said mold-body and plunger, and a removable  
25 bottom board or plate interposed between said mold-body and table, said table being provided with a supporting-frame having an extension at one side of and below the table, and a hand-barrow or the like removably supported on said extension in position to receive the bottom board and completed block,  
30 substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JACOB HERR.

Witnesses:

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CHARLES V. HULMER.