C. M. STARR.

CEMENT BRICK PRESS.

APPLICATION FILED JULY 8, 1909.

965,247.

Patented July 26, 1910.

2 SHEETS—SHEET 1.

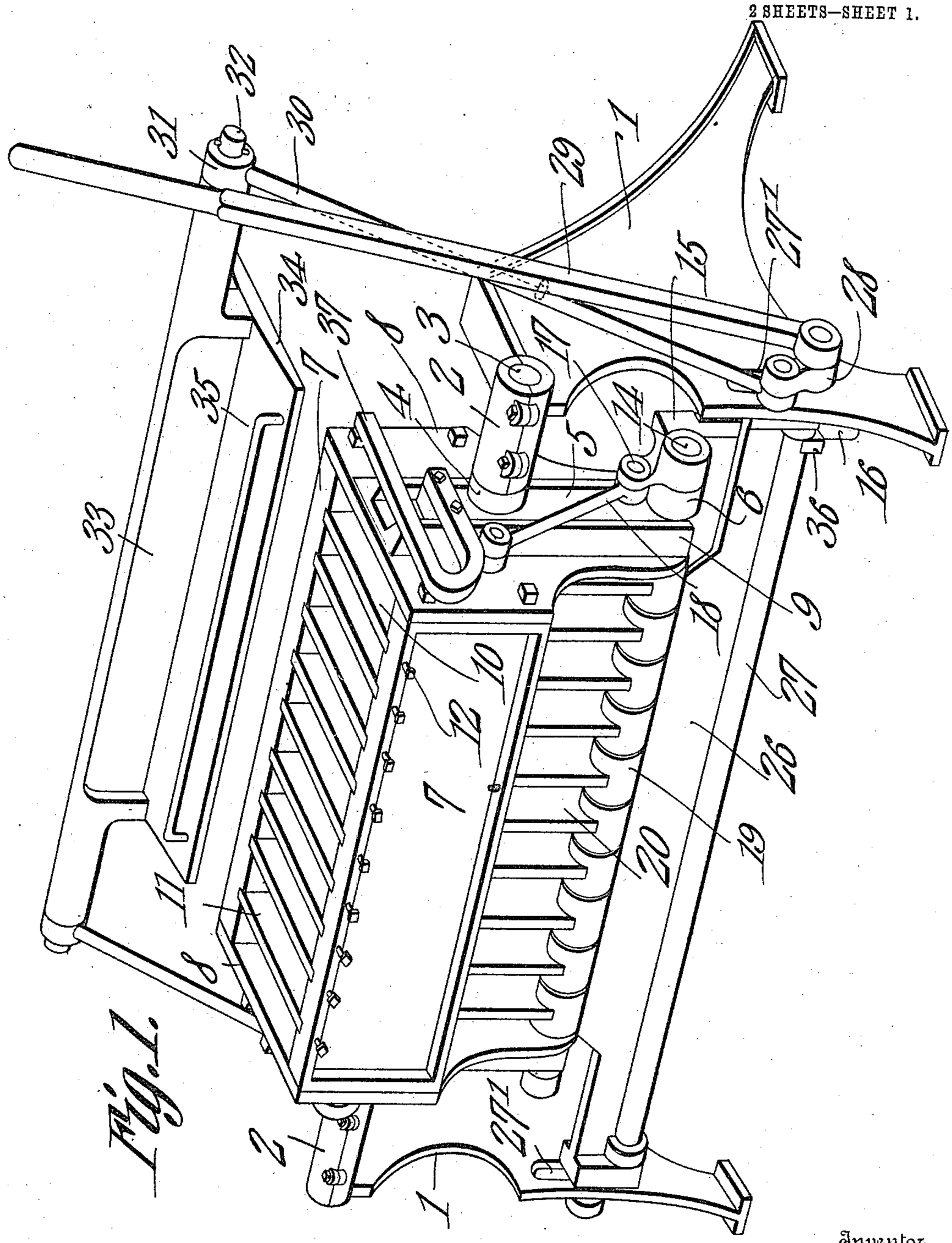



Fig. 1.

Witnesses

E. O. Stewald

R. F. Bishop

Inventor

Charles M. Starr.

By Crowtleo.

Attorneys

C. M. STARR.

CEMENT BRICK PRESS.

APPLICATION FILED JULY 8, 1909.

965,247.

Patented July 26, 1910.

2 SHEETS—SHEET 2.

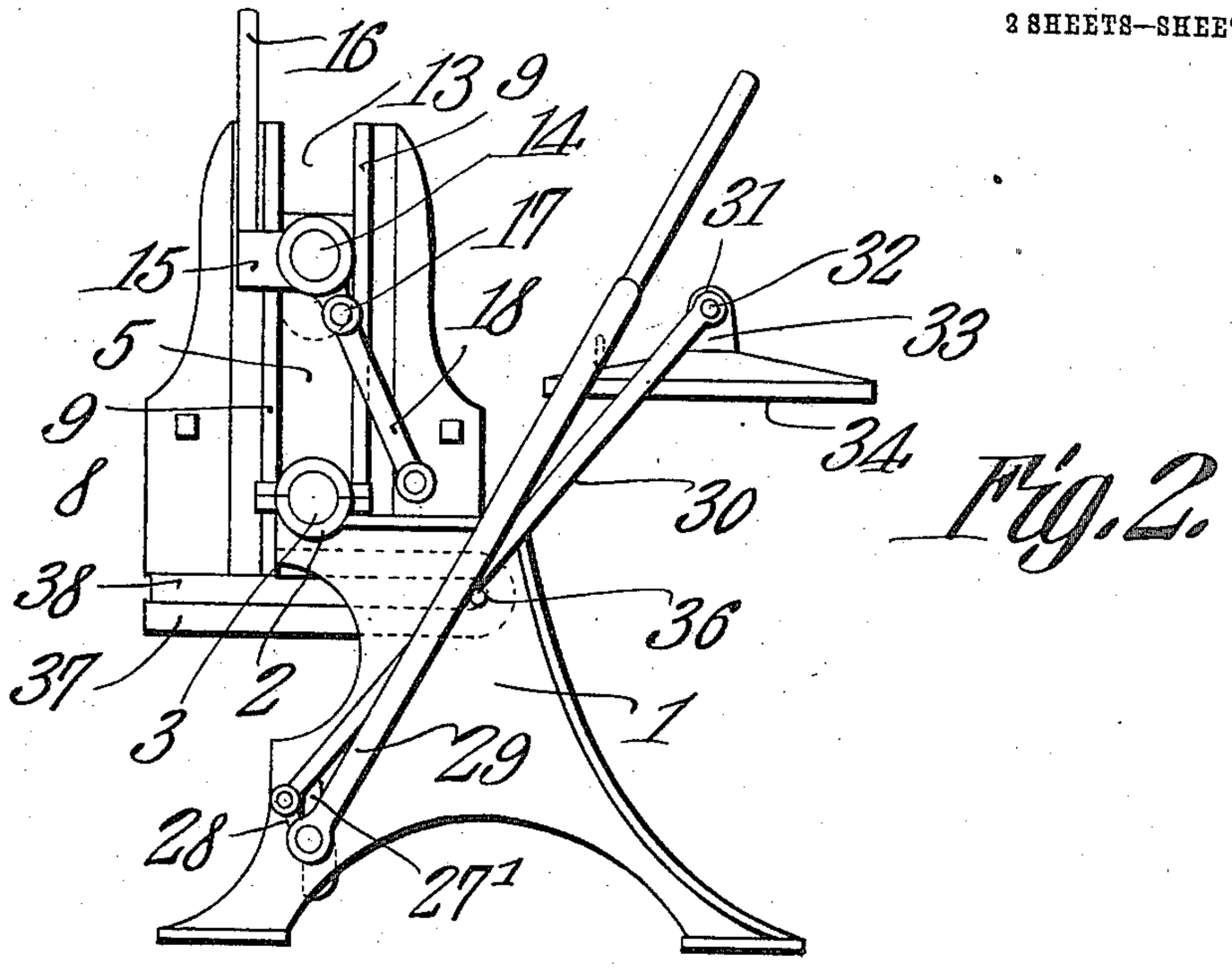



Fig. 2.

Fig. 3.

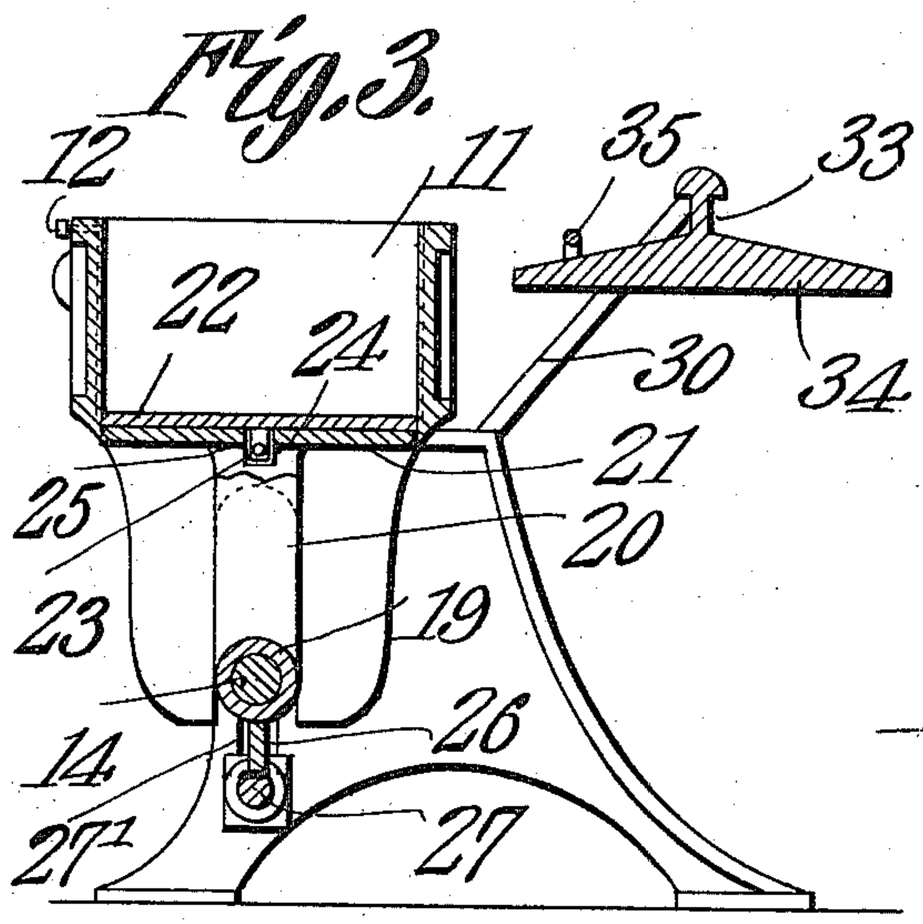
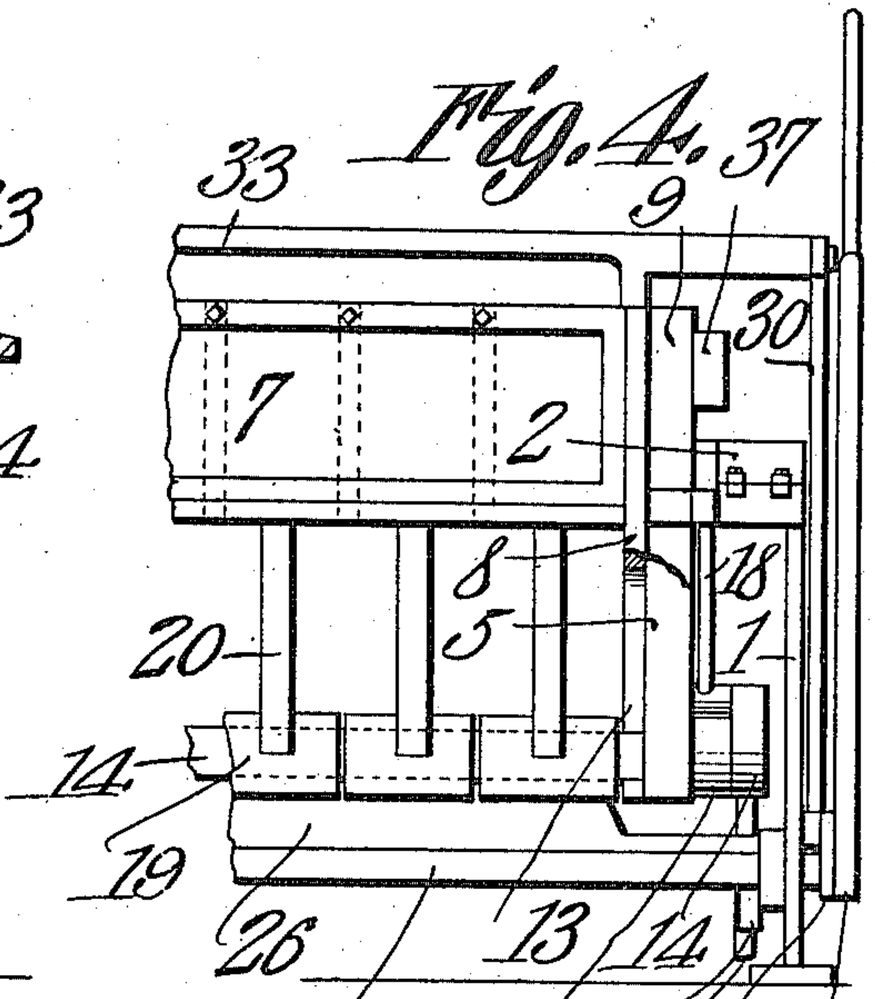



Fig. 4.



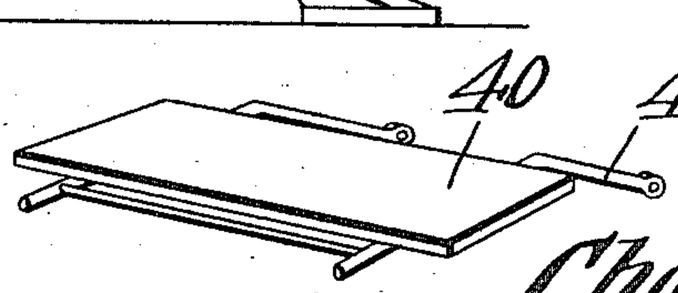




Fig. 5.

Witnesses

E. F. Kleinlein

R. H. Bishop

Inventor

Charles M. Starr.

By Cushman & Co.

Attorneys

# UNITED STATES PATENT OFFICE.

CHARLES M. STARR, OF SOUTH BEND, INDIANA.

## CEMENT-BRICK PRESS.

965,247. Specification of Letters Patent. Patented July 26, 1910.

Application filed July 8, 1909. Serial No. 506,565.

*To all whom it may concern:*

Be it known that I, CHARLES M. STARR, a citizen of the United States, residing at South Bend, in the county of St. Joseph and State of Indiana, have invented a new and useful Cement-Brick Press, of which the following is a specification.

This invention relates to improvements in presses for acting on plastic material, and has special reference to a press for making cement bricks.

The principal object of the invention is to produce a machine, by the use of which the cement bricks may be easily and rapidly manufactured, and in which the bricks may be compressed face downward and delivered face upward.

A further object of the invention is to provide a machine for the purpose stated which will be composed of few parts and may be easily operated, all of which will hereinafter be first fully set forth and then particularly pointed out in the appended claims.

In the accompanying drawings, which fully illustrate my invention, Figure 1 is a perspective view of a press embodying the improvements and showing the parts in the position assumed when the press is at rest and the mold box is empty. Fig. 2 is an end elevation of the press showing the mold box inverted in position to discharge the bricks. Fig. 3 is a transverse vertical section of the press. Fig. 4 is a front elevation of one end of the press, and Fig. 5 is a detailed, perspective view of a slight modification.

The supporting frame of the press consists of two cheek plates 1, each of which is provided at its upper front corner with a journal box 2 in which is mounted a trunnion or shaft 3, fixed within a collar 4 near the upper end of a guide block 5 which is provided with a similar collar or hub 6 at its lower end, as clearly shown in Fig. 1. The cheek plates 1 are spaced apart so as to accommodate the working parts of the press, and a guide plate 5 is hung on each cheek block in the manner described, as will be readily understood. Between the guide blocks 5, I insert the mold box consisting of sides 7 and end plates 8 secured to the sides by cap screws or bolts, the said end plates each being provided on its outer face with guiding ribs 9 adapted to fit upon the guide block 5 so as to permit the mold box to slide on the said guide blocks. The mold box is divided into a series of pressing chambers 10 by division plates 11 which fit within grooves formed in the inner face of the sides of the mold box and are held therein by means of suitable set screws 12, as will be readily understood. The end plates 8 are constructed with slots 13 so that the mold box may ride past a shaft 14 which is journaled in the hub 6 and carries a crank arm 15 at one end, from which depends a handle or lever 16. The said shaft 14 also carries a second crank arm 17 to which is pivoted one end of a pitman 18, the opposite end of which is pivotally attached to the end plate 8, as shown most clearly in Fig. 1, it being understood that the crank 17 and the pitman 18 are duplicated at the opposite end of the press.

The shaft 14 passes through a series of collars or hubs 19, from each of which rises a plunger 20 at the upper end of which is a head or plate 21 fitting within the chambers 10 of the mold box. As shown most clearly in Fig. 3, a presser or face plate 22 is fitted upon the plunger head 21 and is provided with a depending lug or stud 23 which enters a transverse opening 24 in the plunger, and is retained in such engagement by a pin 25 inserted through the lugs 23 to bear against the underside of the plate 21. The face plate 22 is of a proper size to fit snugly within the compression chamber, and at the same time have a slight play upon the plunger, so that it may adjust itself to the walls of the chamber. Its use facilitates the production of any desired design on the finished brick, inasmuch as one face plate may be readily removed and a different one substituted.

Below the shaft 14 and the plungers carried thereby, I provide a brace bar 26 which is adapted to bear against the hubs 19 of the plungers and thereby aid in supporting the same and reducing the strain on the shafts 3 and the bearings 2 in which said shafts are journaled. This brace bar 26 carries on its underside a rock shaft 27 which extends through slots 27′ in the cheek plates 1, and is provided at its ends with crank arms 28 and at one end with an

operating lever 29, the lever being extended upward from the shaft so as to be conveniently grasped by the operator in the manipulation of the machine. The slots 27′ receive the ends of the brace bar 26 and permit a slight vertical movement of the same and the shaft 27 carried thereby.

In the ends of the cranks 28 I journal the ends of connecting rods 30 which extend upward and rearward and are provided at their upper ends with collars or hubs 31 in which are mounted trunnions 32 at the ends of a cross bar 33 carrying a cover or presser plate 34 at its lower edge, the said cover or presser plate being provided with a handle 35 near its front edge, as clearly shown. When the cover or presser plate is in its position of rest, the connecting rods 31 are supported upon pins or stops 36 projecting from the cheek plates. The rock shaft 27 is provided near its handle end with a tappet or cam 36 which is arranged in position to impinge against the lever 16 for a purpose which will presently appear.

In order to provide for a delivery of the bricks from the press I secure to the upper ends of the guides 5, the pallet supports 37 which are shown as consisting of substantially U-shaped bars having one arm secured to the guide by bolts or similar fasteners, and the other arm extending parallel with the top of the mold box, and above the end of the guide so that after the bricks have been formed, a pallet 38 may be inserted between the arms of the support over the mold box so that when the mold box is inverted, the bricks will be supported by the said pallet and may be removed on the pallet and carried to the place of drying.

In manufacturing the bricks by the use of my invention, the parts are arranged as shown in Fig. 1, and the material for the bricks is discharged into the mold box in any convenient manner so as to fill all the compressing chambers. After the chambers have all been completely filled, the surplus material is removed by means of a straight edge or convenient scraper and the cover or presser plate 34 is then manually brought into position over the mold box by grasping the handle 35, as will be readily understood, the cover plate swinging into position upon the mold box upon the journaled connection of the connecting rods 30 and the crank 38, as a center. The lever 29 is then swung forward so as to rotate the rock shaft 27 and thereby cause the tappet 36 to strike against the lever 16 and swing the same slightly rearward thereby throwing the crank arm 17 out of the position shown in Fig. 1 whereupon the continued forward movement of the lever 29 will transmit power to the connecting rods 30 and the cover 34 to move the mold box downward and thereby compress the material between the plungers and the cover. In the position shown in Fig. 1 the crank arm 17 and the pitmen 18 are on a dead center so as to lock the mold box against downward movement. When the lever or handle 16 is thrown rearward by the impact of the tappet 36, the crank arm 17 will be thrown slightly forward off the dead center, and the mold box may then descend under the power applied thereto through the lever 29, the connecting rods 30 and the cover 34, as before described. After the pressure has been applied so as to compress the bricks in the manner stated, the cover is swung back to its initial position, and the pallet 38 inserted under the upper arms of the pallet support 37 over the mold box, it being understood that the said supports are so positioned that before compression of the material, they lie below the top of the mold box out of the way of the cover, but after the mold box has been lowered so as to accomplish the desired compression, the said arms will lie above the top of the mold box a distance equal to the thickness of the pallet so that the pallet may be readily inserted in position. The lever 16 is now manually manipulated so as to swing the mold box and the contained plungers upon the shafts 3 as a center so as to invert the mold box and cause the pallet to support the bricks as a result of said inversion. The parts will then be in the position shown in Fig. 2, and the lever 16 may be caused to lift the mold box from over the bricks by being swung downward and forward, causing it to rotate around the shaft 14 and thereby causing the crank 17 to swing rearward and upward, and draw upon the pitmen 18 so as to move the mold box upward, as will be readily understood. The bricks will thus be left exposed on the pallet and may be readily removed by merely drawing the pallet forward upon the supports 37. The press may then be restored or returned to its initial position, ready to receive a second charge and form a second quantity of the bricks.

In Fig. 5 I have shown a slight modification in which a pallet 40 is supported upon a pair of levers 41 which may be pivoted at their rear ends to the frame of the press so that after the mold box has been inverted, the levers may be swung upward so as to bring the pallet up to the open ends of the compression chambers, in position to receive the bricks from the same. The bricks may then be removed and placed to one side for drying in the manner previously described.

It will be observed, upon reference to Fig. 1 that the hubs 19 are out of contact with each other. This arrangement provides some play of the plungers so that they may vibrate slightly within the compression chambers and thereby avoid sticking which

would injure the product. The brace bar 26 serves to support the hubs 19 and the shaft 14 passing through the same during the pressing operation so as to reduce the strain on the bearings 2 and the shafts 3, but the said bar is not essential to the successful operation of the machine as it may be omitted and the other parts made heavier in order to acquire the proper strength.

If desired, the shafts 3 may be attached to the end plates of the mold-box instead of the guide blocks 5, the connection of the shafts to the mold-box being effected by means of brackets which embrace the guide blocks, as, for instance, by forming the collar 4 as a part of the guiding ribs 9 instead of on the blocks 5. With this arrangement, the plungers will be moved upward within the mold-box instead of the mold-box being moved downward over the plungers to compress the bricks and after the mold-box is inverted the plungers are moved downward to discharge the bricks. The slots 27′ in the cheek plates permit the necessary vertical movement of the shaft 27 in the operation of moving the plungers and it is my purpose to supply the machine adjusted for either operation as the customer may prefer.

The press may be adjusted to form bricks of different sizes by manually shifting the position of the mold box so as to bring the plungers relatively higher within the same before filling the compression chambers with the material of which the bricks are to be made, any suitable catch being utilized to hold the mold box in its adjusted position until the pressing operation has been completed. In the same manner it may be used to form a tamped brick by adjusting the mold box upon the plungers until the compression chambers are of the dimensions desired for the brick and then placing a board over the mold box and inverting the same in the manner previously described, it being understood that the material is in this instance packed within the compression chamber by a suitable tamping tool.

It will be readily seen from the foregoing description that this press forms the bricks face downward and delivers them face upward, so that they may be formed in any ornamental design and may be discharged from the mold without cracking the face or otherwise injuring the brick. This operation has the additional advantage that the greatest pressure will be applied to the face of the brick so that the said face will be the hardest part of the finished brick, whereas in presses heretofore made, so far as I am aware, the greatest pressure was applied to the back or sides of the brick. The bricks are not discharged from the mold until the mold is entirely inverted so that the bricks will be inclosed and protected until they have fully reached the delivery position. The breakage of one plunger will not put the machine out of commission as a new plunger may be substituted for the damaged one without requiring the provision of an entire set of plungers or the machine may be operated temporarily without using the compression chamber in which the defective plunger works. The shafts 3, which form the main supports for the mold, are placed at about the center of gravity of the same so that the work of inverting the mold may be performed with very little labor.

The machine is very simple in construction and is composed of few parts which are compactly arranged so that it may be operated with little difficulty.

Having thus described my invention, what I claim is:—

1. The combination of a frame, guides pivotally hung on the frame, plungers supported by the lower ends of the guides, a mold box slidably mounted upon the plungers, means for holding the mold box normally elevated, a cover adapted to rest upon the mold box, means for applying pressure to the cover, and means actuated by the pressure applying means to release the means for holding the mold box elevated.

2. The combination of a supporting frame, guides pivotally mounted on the said frame, a mold box slidably mounted on the said guides, plungers supported by the said guides and fitting within the mold box, means for sliding the mold box upon the guides to compress material upon the plungers, and means for swinging the said guides so as to invert the mold box.

3. The combination of plungers, a mold box movable upon the plungers, a rock shaft mounted below the plungers and having crank arms, connecting rods journaled in said crank arms, a cover carried by the said connecting rods and adapted thereby to be swung over upon the mold box, and means for rotating the rock shaft whereby after the cover is on the mold box pressure will be applied thereto through the connecting arms to compress material between the cover and the plungers.

4. The combination of plungers, a rock shaft supporting said plungers, crank arms on the said rock shaft, a mold box fitting over the plungers, pitmen connecting the crank arms with the said mold box, a lever depending from the said rock shaft, a second rock shaft below the first mentioned rock shaft carrying a tappet adapted to impinge against the said lever, means for actuating the said second rock shaft, and a cover adapted to rest on the mold box and connected with the said second rock shaft.

5. The combination of a supporting frame, guides pivotally hung on the said frame, a rock shaft carried by the said guides,

plungers carried by the said rock shaft, a mold box slidably mounted on the said guides and fitting over the plungers, crank arms on the rock shaft, and pitmen connecting the said crank arms with the mold box.

6. In a press of the character described, the combination of guides, a mold box slidably mounted on the said guides, and pallet supports secured to the said guides and arranged to lie normally below the top of the mold box and project above the top of the mold box after a pressing operation.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES M. STARR.

Witnesses:
G. H. CASE,
FRANK P. LEHMANN.