No. 760,446. PATENTED MAY 24, 1904.

G. M. GRAHAM.

CONCRETE MOLDING APPARATUS.

APPLICATION FILED SEPT. 11, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

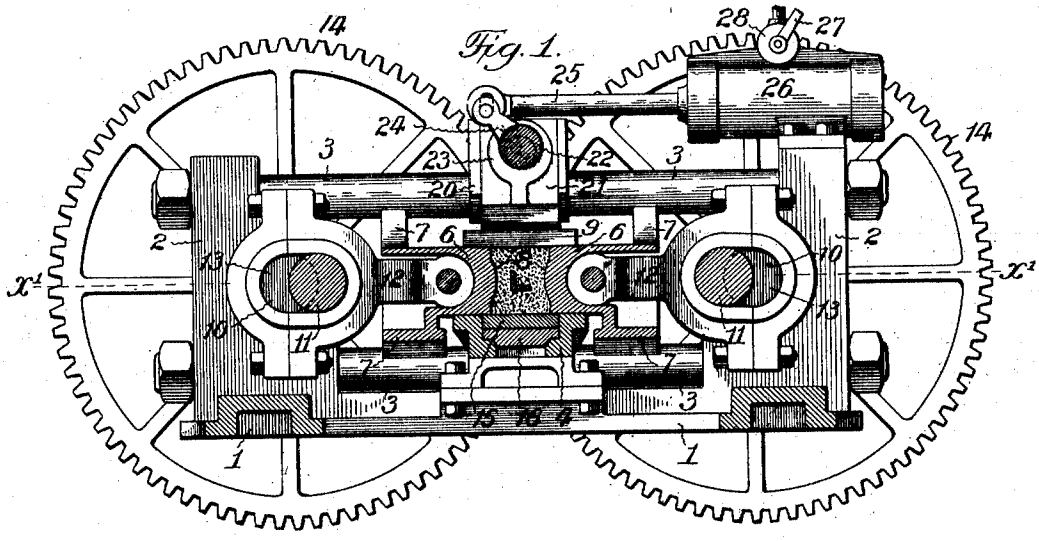
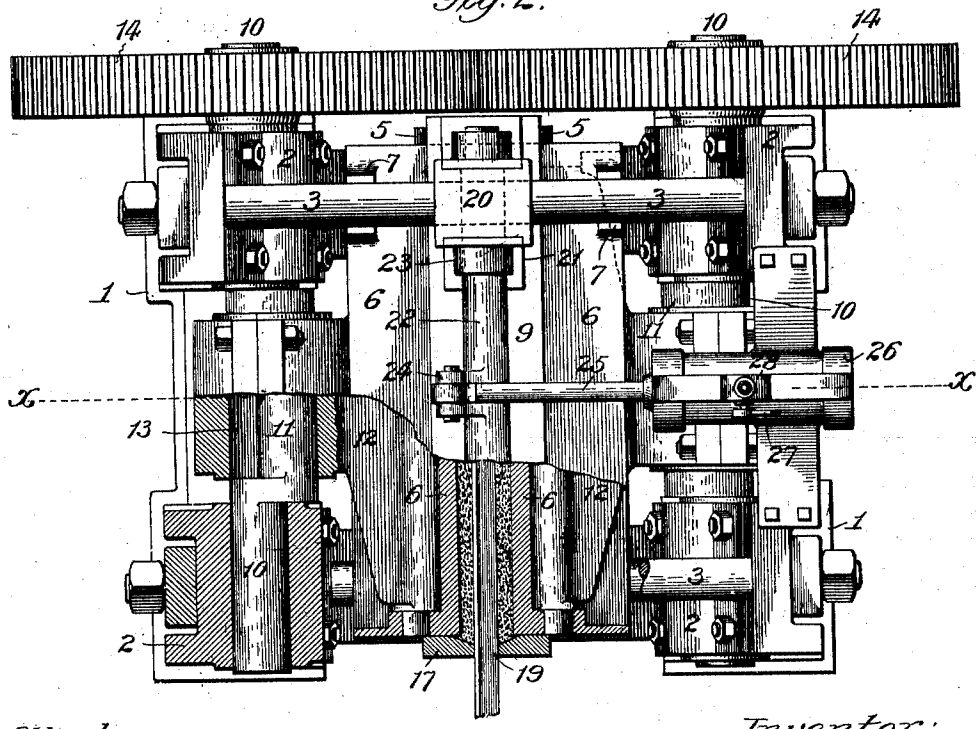


Fig. 2.



Attest:
John Enders.
M. M. Holmes

Inventor:
George M. Graham.
by Robert Burns
Attorney.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 760,446. PATENTED MAY 24, 1904.

G. M. GRAHAM.

CONCRETE MOLDING APPARATUS.

APPLICATION FILED SEPT. 11, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

Fig. 3.

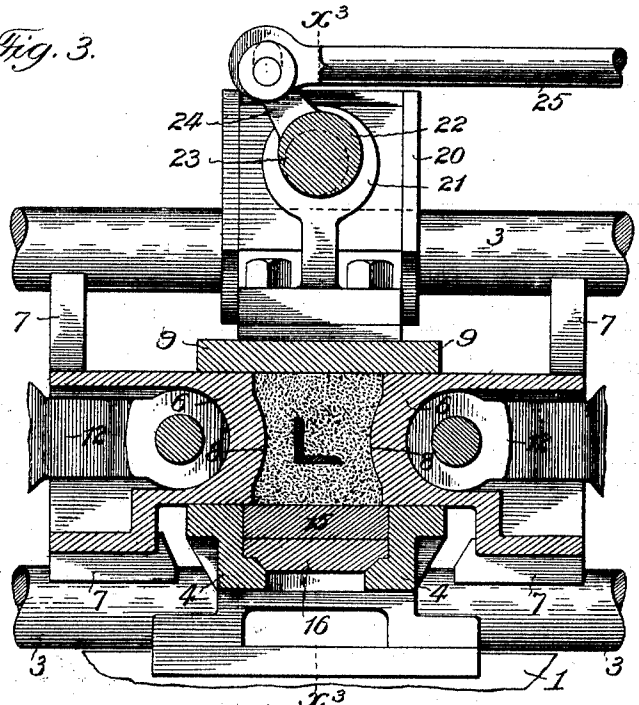


Fig. 5.

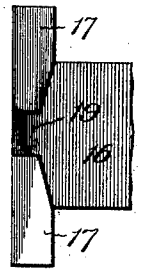
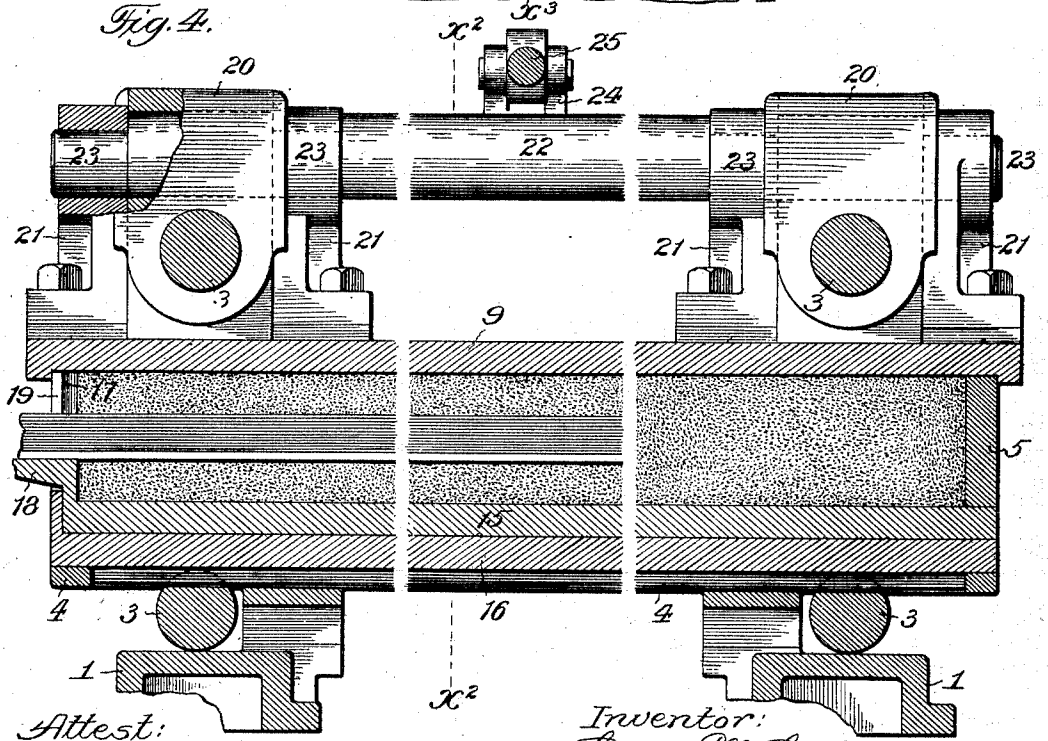


Fig. 6.

Fig. 4.



Attest:
John Enders.
M. A. Holmes

Inventor:
George M. Graham.
by Robert Burns
Attorney.

No. 760,446. Patented May 24, 1904.

UNITED STATES PATENT OFFICE.

GEORGE M. GRAHAM, OF CHICAGO, ILLINOIS.

CONCRETE-MOLDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 760,446, dated May 24, 1904.

Application filed September 11, 1903. Serial No. 172,722. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. GRAHAM, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Concrete-Molding Apparatus, of which the following is a specification.

The present invention relates to molding-presses for the manufacture of concrete fence-posts and other like concrete articles, and has for its object to provide a simple and efficient structural arrangement and combination of the press parts affording a powerful and uniformly-distributed pressure throughout the entire mass of the concrete material and a ready release of the article after such compression, so that the same may be easily and conveniently removed from the press, all as will hereinafter more fully appear and be more particularly pointed out in the claims.

In the accompanying drawings, illustrative of the present invention, Figure 1 is a longitudinal sectional elevation on line $x\,x$, Fig. 2, of a concrete molding-press embodying the present invention. Fig. 2 is a plan view of the same with parts in section on line $x'\,x'$, Fig. 1. Fig. 3 is an enlarged detail longitudinal section of the central portion of the press at line $x^2\,x^2$, Fig. 4. Fig. 4 is an enlarged detail transverse section of the same at line $x^3\,x^3$, Fig. 3. Fig. 5 is a detail plan view of one end of the mold-pallet. Fig. 6 is a similar view of one end of the mold-pallet carrier.

Similar numerals of reference indicate like parts in the several views.

Referring to the drawings, 1 represents the supporting-base of the press, having pedestals 2 at each end of the counterpart operating-shafts of the press.

3 represents upper and lower pairs of longitudinal tie-rods for connecting the pedestals 2 aforesaid together and forming guides for the mold-plungers hereinafter set forth.

4 is a central transversely-arranged stationary mold member secured to the main base, with its respective side surfaces constituting a bed-plate upon which the reciprocating plungers of the press mechanism has movement. Such mold member is recessed out centrally along the transverse length of the press to form a receiving-cavity for the mold-pallet and pallet-carrier hereinafter described and which parts constitute the bottom for the mold-cavity or chamber of the press.

5 is a stationary vertical plate extension at one end of the aforesaid member adapted to constitute a stationary end head for the transversely-extending and horizontally-arranged mold-cavity of the press.

6 represents a pair of opposed counterpart reciprocating plungers, upon which a rectilinear motion is imposed by guide extensions 7 on said plungers, having sliding engagement with the tie-rods 3, before described. The opposed faces of said plungers constitute the respective vertical side walls of the mold-cavity, and in the present invention such faces or walls of the plungers are provided with convex projections 8 along the mid-height of said vertical faces, which are adapted to form concave depressions in the opposite sides of the concrete fence-post or other article and in the pressing operation of said plungers to evenly distribute the pressure throughout the whole of the concrete mixture within the mold-cavity and attain uniform density or bond in the same, with a corresponding increased strength in the finished article.

9 is an upper plate or platen arranged centrally above the plungers 6 and forming the top wall or cover of the mold-cavity of the press. In the present invention such plate or platen has a vertical movement to and from the mold-cavity and a reciprocating movement longitudinal of the press to cover and uncover the mold-cavity, as hereinafter more fully described.

10 represents counterpart operating-shafts paneled in the pedestals 2 of the supporting-base 1 and which are provided with central crank-pins 11, having pitman connections 12 with the respective press-plungers 6 and adapted to impart simultaneous reciprocation to said plungers to and from each other.

In the present invention the yokes of the

pitman connections 12 aforesaid are formed with elongated bearing-orifices 13 for the crank-pins 11, as shown in Figs. 1 and 2, for the purpose of allowing lost motion between such parts and so that the press-plungers during the continued operation of the press mechanism will have periods of rest at the forward and backward positions of said plungers. In the one case such period of rest aids in the setting of the concrete mass while held in a confined position within the mold-cavity and in the other case such period of rest allows the mold-cavity to remain fully open for a corresponding period of time to permit of a convenient and effective filling of the same with the concrete mixture. The horizontal arrangement of the mold-cavity in this connection is of material assistance in such filling operation by affording a filling-opening the greatest length of such mold-cavity.

14 represents gear-wheels, imposing simultaneous rotation on the operating-shafts 10 aforesaid.

15 is the mold-pallet or bottom plate, fitting the recess of the aforesaid mold member 4, with the top surfaces of both parts on a level, as shown in Figs. 1 and 3. Such pallet is adapted to form the actual bottom of the mold-cavity and constitute a support for the concrete work or other article in the handling of the same subsequent to the molding or pressing thereof.

16 is the pallet-carrier, also fitting the aforesaid recess in the mold member 4 and adapted to slide transversely into place therein or to be removed therefrom in a like manner and in either case carrying the mold-pallet 15 and the concrete fence-post or other article when the same is superimposed on said pallet.

17 is a vertical plate extension at the end of the pallet-carrier 16, adapted to constitute the other end-closure head for the mold-cavity of the press.

With the use of the present press for molding composite fence-posts in which the base of the post is formed by a mass of concrete, in which in turn a central iron bar or core is embedded and projects from said mass to constitute the upper and superior portion of the fence-post, the mold-pallet 15 will be formed with an offsetted shelf or support 18 for the iron core-piece of the post, while the vertical end extensions 17 of the pallet-carrier will be provided with a vertical slot 19 to permit of the introduction of the required portion of such core into the mold-cavity, as more particularly set forth in my companion application for Letters Patent, Serial No. 172,721.

In the practical use of the press a series of mold-pallets 15 will be employed, so as not to delay the output of the press and so that the same pallet may be used with a post during the subsequent seasoning of the concrete article after it has been formed in the press.

20 represents carriages having a horizontal sliding movement upon the upper pair of tie-rods 3, as shown in Figs. 1, 2, 3, and 4.

21 represents vertical extensions on the before-described upper plate or platen 9 of the mold-cavity and which extensions are adapted to have a limited vertical sliding movement in the carriages 20 aforesaid.

22 is a transverse shaft journaled in the carriages 20 and provided with a series of eccentric or crank pins 23, which are adapted to have operative engagement with the upper ends of the vertical extensions 21 aforesaid, so that with a partial rotation of the shaft 22 in one direction or the other an upward or a downward movement, as the case may be, will be imparted to the top platen 9 of the mold-cavity through the medium of such crank-pins and the extensions 21 aforesaid.

24 is an operating-arm on the shaft 22, operatively connected to the piston-rod 25 of a motor-engine 26, carried on the main base 1, and which in the construction shown in the drawings is controlled by the operator through the instrumentality of a hand operating-lever 27, connected to the controlling-valve 28 of said engine.

The operation of the foregoing mechanism is as follows: Assuming the parts to be in the position illustrated in Fig. 1 of the drawings, with the top platen 9 in a position closing the top of the mold-cavity and with the press-plungers 6 having made their forward active or compression stroke, motive fluid is admitted to motor-engine to force its piston and piston-rod 25 in a direction away from the center of the press. With the initial portion of such movement of the piston and piston-rod a rocking of the shaft 22 in the direction of the described movement takes place through the rock-arm 24, and an upward movement of the platen 9 is effected through the medium of the crank-pins 23 and the vertical extensions 21 to release said platen from all frictional or surface engagement with the upper surfaces of the mold parts. With a further and continued stroke of the piston and piston-rod of the motor-engine in the direction described the platen 9 is drawn into a position from over the mold-cavity to uncover the top of the same and permit of the ready removal of the pressed post or other article and the filling of the mold-cavity with a fresh charge of concrete material. The operator now reverses the controlling-valve 28 of the motor-engine to cause a movement of the piston and piston-rod 25 in a direction toward the center of the press and move the carriages 20, with the platen 9, into a proper position above the molded cavity. With a further and final movement of said piston-rod a rocking of the rock-shaft 22 in the direction of the described movement is effected, and a downward movement of the platen 9 is attained through the medium of the crank-pins 23 and vertical exten-

sions 21 to effect a substantially tight closure of the top of the mold-cavity of the press and to inclose therein the loose mass of concrete material which has been introduced into the mold-cavity previous to the described mold-closing operation. The press mechanism is now in readiness for the active or pressure movements of the press-plungers 6 against the opposite sides of the concrete material to compact the same into a mass of the required size and shape and ready for a repetition of the cycle of movements above described.

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

1. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier, end walls for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

2. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier, end walls for the mold-cavity and means for imparting intermittent reciprocation to the press-plungers, substantially as set forth.

3. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier, end walls for the mold-cavity, and means for imparting intermittent reciprocation to the press-plungers the same comprising a pair of driving-shafts journaled on the supporting-base and provided with crank-pins, and pitman connections the yokes of which are formed with oblong bearing-orifices for the crank-pins, substantially as set forth.

4. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity, means for imparting independent vertical and horizontal movements to said platen, a mold-pallet, a pallet-carrier, end walls for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

5. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the molded cavity, means for imparting independent vertical and horizontal movement to said platen, the same comprising one or more sliding carriages carrying said platen, a rock-shaft on said carriages having operative connection with said platen, and a motor-engine adapted to impart a rocking movement to said shaft and a reciprocation to said carriages, a mold-pallet, a pallet-carrier, end walls for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

6. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto and provided with a vertical end extension to form an end wall for the mold-cavity, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

7. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto and provided with a vertical end extension to form an end wall for the mold-cavity, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting intermittent reciprocation to the press-plungers, substantially as described.

8. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame se-

cured thereto and provided with a vertical end extension to form an end wall for the mold-cavity, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting intermittent reciprocation to the press-plungers, the same comprising a pair of driving-shafts journaled on the supporting-base and provided with crank-pins, and pitman connections the yokes of which are formed with oblong bearing-orifices for said crank-pins, substantially as set forth.

9. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto and provided with a vertical end extension to form an end wall for the mold-cavity, a pair of opposed plungers adapted to have movement to and from each other on the upper surfaces of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity, means for imparting independent vertical and horizontal movements to said platen, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

10. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto and provided with a vertical end extension to form an end wall for the mold-cavity, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity, means for imparting independent vertical and horizontal movements to said platen, the same comprising one or more sliding carriages carrying said platen, a rock-shaft on said carriages having operative connection with said platen, and a motor-engine adapted to impart a rocking motion to said shaft and a reciprocation to said carriages, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

11. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base formed with journal-pedestals at each end and tied together by longitudinal series of upper and lower tie-rods, a stationary mold-frame secured to said base and provided with a vertical end extension to form an end wall for the mold-cavity, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of said mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

12. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base formed with journal-pedestals at each end and tied together by longitudinal series of upper and lower tie-rods, a stationary mold-frame secured to said base and provided with a vertical end extension to form an end wall for the mold-cavity, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of the mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity, means for imparting independent vertical and horizontal movements to said platen, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

13. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base formed with journal-pedestals at each end and tied together by longitudinal series of upper and lower tie-rods, a stationary mold-frame secured to said base and provided with a vertical end extension to form an end wall for the mold-cavity, a pair of opposed plungers adapted to have movement to and from each other on the upper surface of the mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity, means for imparting independent vertical and horizontal movements to said platen, the same comprising one or more sliding carriages carrying said platen, a rock-shaft on said carriages having operative connection with the said platen, and a motor-engine adapted to impart a rocking motion to said shaft and a reciprocation to said carriages, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting reciprocation, substantially as set forth.

14. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame

secured thereto, a pair of opposed plungers formed with convex projections on their pressure-faces and extending the length of the same, said plungers having movement to and from each other on the upper surface of the mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier, end walls for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

15. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto, a pair of opposed plungers formed with convex projections on their pressure-faces and extending the length of the same, said plungers having movement to and from each other on the upper surface of the mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier, end walls for the mold-cavity, and means for imparting intermittent reciprocation to the press-plungers, the same comprising a pair of driving-shafts journaled on the supporting-base and provided with crank-pins, and pitman connections, the yokes of which are formed with oblong bearing-orifices for the crank-pins, substantially as set forth.

16. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto, a pair of opposed plungers formed with convex projections on their pressure-faces and extending the length of the same, said plungers having movement to and from each other on the upper surface of the mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity, means for imparting independent vertical and horizontal movements to said platen, a mold-pallet, a pallet-carrier, end walls for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

17. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto and provided with a vertical end extension to form an end wall of the mold-cavity, a pair of opposed plungers formed with convex projections on their pressure-faces and extending the length of the same, said plungers having movement to and from each other on the upper surface of the mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

18. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto and provided with a vertical end extension to form an end wall of the mold-cavity, a pair of opposed plungers formed with convex projections on their pressure-faces and extending the length of the same, said plungers having movement to and from each other on the upper surface of the mold-frame, an upper platen spanning said plungers to form a top closure for said mold-cavity and removable therefrom in a horizontal direction, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting intermittent reciprocation to the press-plungers, the same comprising a pair of driving-shafts journaled on the supporting-base and provided with crank-pins, and pitman connections the yokes of which are formed with oblong bearing-orifices for the crank-pins, substantially as set forth.

19. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto and provided with a vertical end extension to form an end wall of the mold-cavity, a pair of opposed plungers formed with convex projections on their pressure-faces and extending the length of the same, said plungers having movement to and from each other on the upper surface of the mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity, means for imparting independent vertical and horizontal movements to said platen, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the mold-cavity, and means for imparting reciprocation to the press-plungers, substantially as set forth.

20. In a concrete-molding apparatus of the character herein described, the combination of a supporting-base, a stationary mold-frame secured thereto and provided with a vertical end extension to form an end wall of the mold-cavity, a pair of opposed plungers formed with convex projections on their pressure-faces and extending the length of the same, said plungers having movement to and from each other on the upper surface of the mold-frame, an upper platen spanning said plungers to form a top closure for the mold-cavity, means for imparting independent vertical and horizontal movements to said platen, a mold-pallet, a pallet-carrier capable of endwise insertion in the mold-frame and provided with a vertical end extension to constitute an end wall for the

mold-cavity, and means for imparting reciprocation to the press-plungers, the same comprising a pair of driving-shafts journaled on the supporting-base and provided with crank-pins, and pitman connections, the yokes of which are formed with oblong bearing-orifices for the crank-pins, substantially as set forth.

Signed at Chicago, Illinois, this 1st day of September, 1903.

GEORGE M. GRAHAM.

Witnesses:
ROBERT BURNS,
M. H. HOLMES.