C. R. BURKHARDT.

PRESS FOR MAKING CONCRETE SLABS.

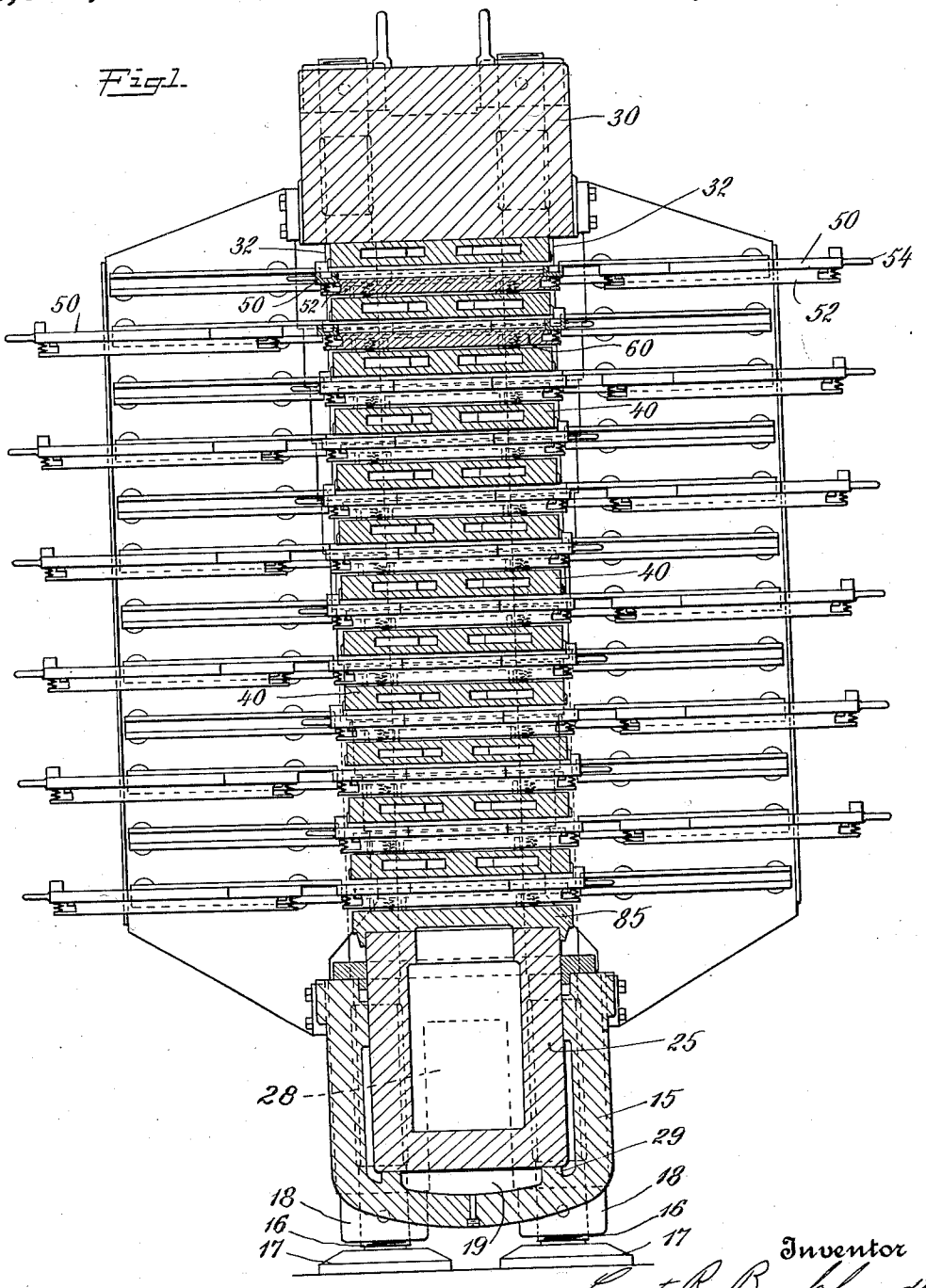
APPLICATION FILED DEC. 12, 1918.

1,332,457.

Patented Mar. 2, 1920.

3 SHEETS—SHEET 1.

Fig 1.



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3 SHEETS—SHEET 2.

Fig. 2.

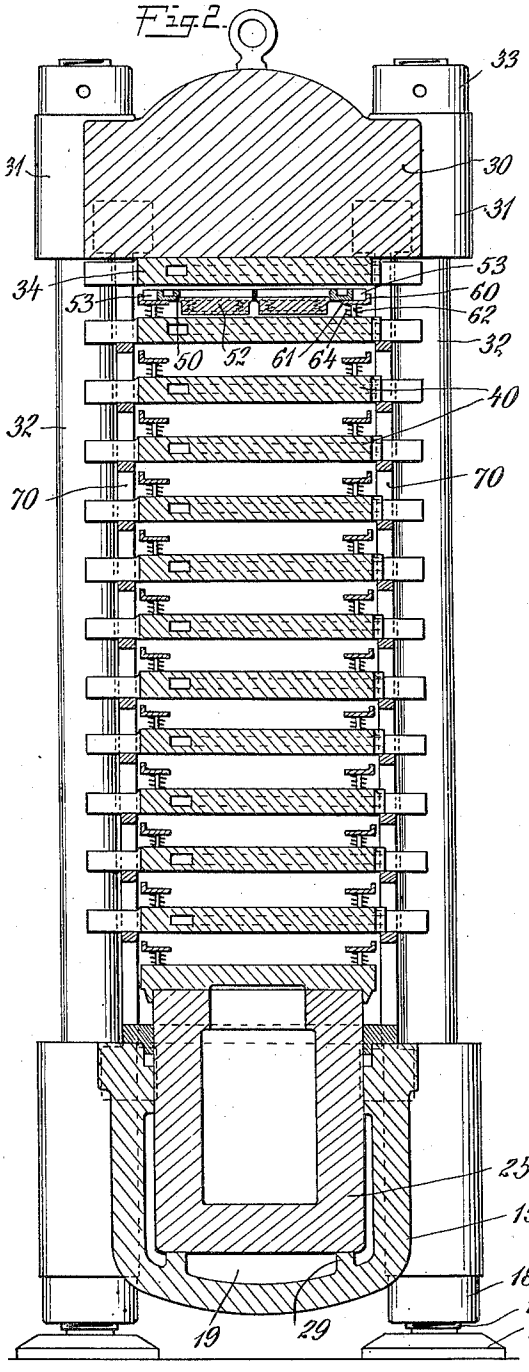


Fig. 3.

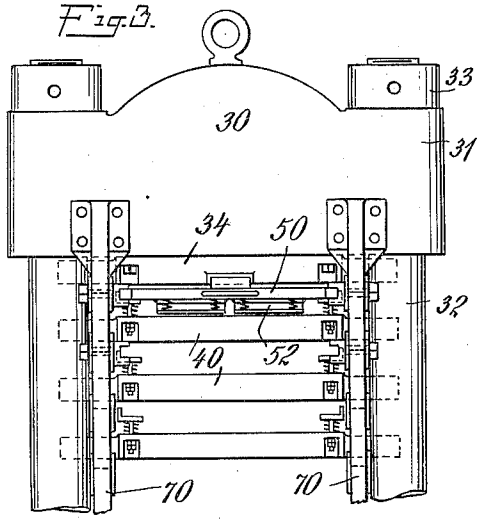


Fig. 4.

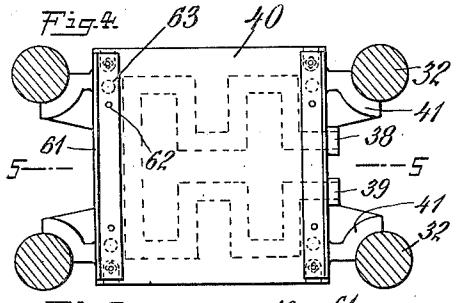


Fig. 5.

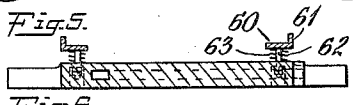


Fig. 6.

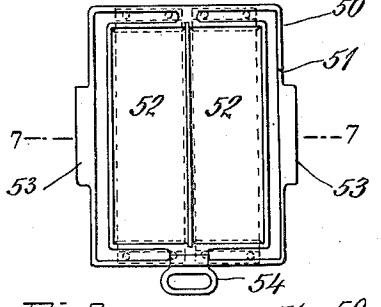
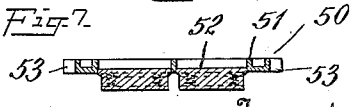


Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 8.

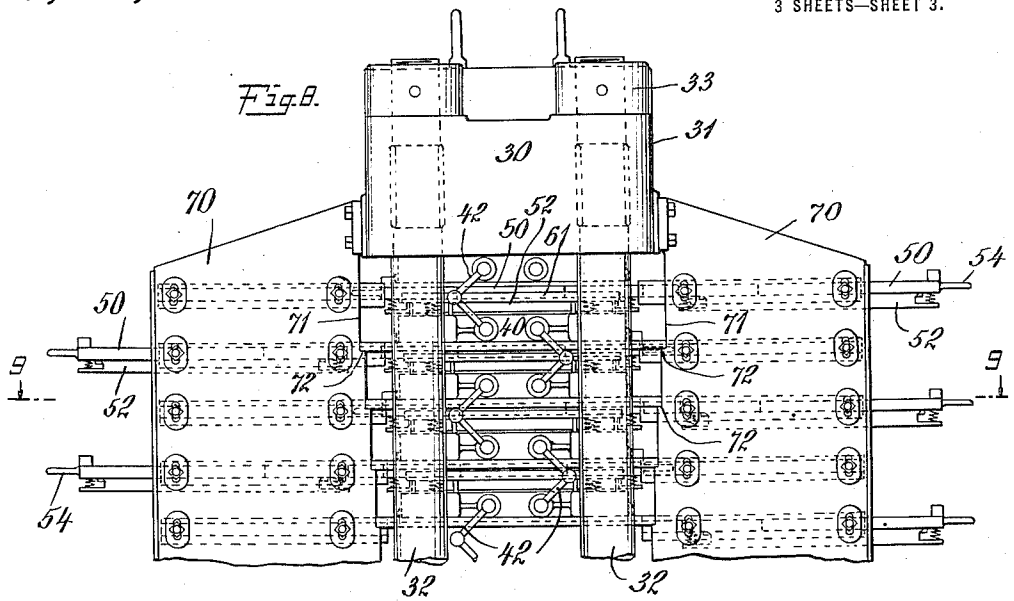


Fig. 9.

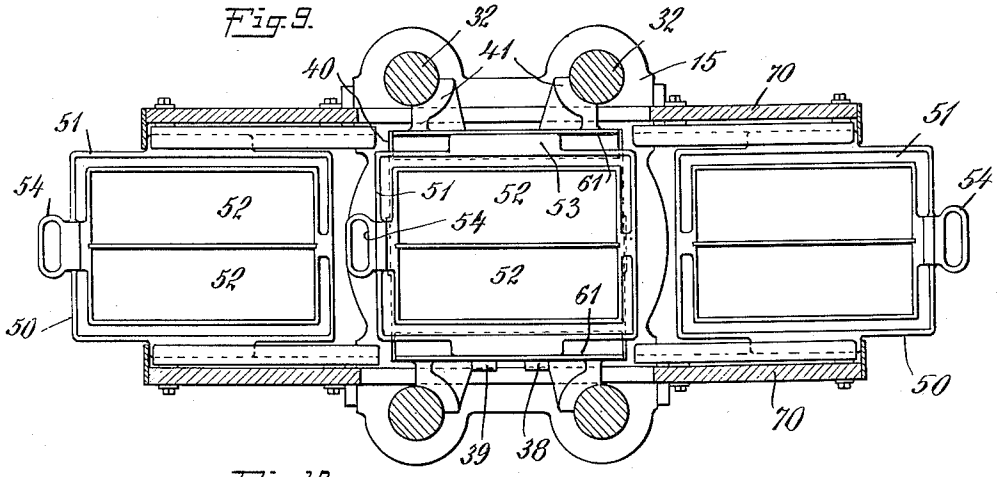
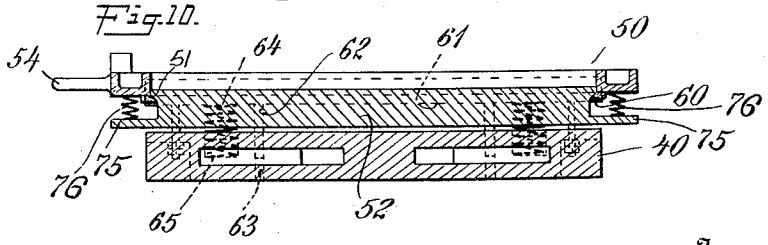


Fig. 10.



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UNITED STATES PATENT OFFICE.

CURT R. BURKHARDT, OF TEANECK, NEW JERSEY, ASSIGNOR OF ONE-HALF TO JOHN A. SCHARWATH, OF ELIZABETH, NEW JERSEY.

PRESS FOR MAKING CONCRETE SLABS.

1,332,457. Specification of Letters Patent. **Patented Mar. 2, 1920.**

Application filed December 12, 1918. Serial No. 266,406.

To all whom it may concern:

Be it known that I, CURT R. BURKHARDT, a citizen of the United States of America, and a resident of Teaneck, Bergen county, and State of New Jersey, have invented certain new and useful Improvements in Presses for Making Concrete Slabs, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to apparatus for producing plates, slabs, tiles, shingles, artificial slate, or like articles from hydraulic cement, sand and asbestos fiber, or from some other suitable concrete mixture. It has special reference to improvements in machines of the character shown and described in my copending application S. #101,461, filed June 3, 1916.

One object of my present invention is to provide a simple and improved means for clamping or pressing each of the molds of which the press is comprised, against the floating or stationary press head next above if after the mold has been filled with concrete mixture and before the compressive force of the press has been applied to the material in the mold.

In my copending application to which reference has just been made, I provide wedge bars for clamping the molds in position to firmly close them after the material has been introduced, and before the pressure is applied and in the preferred embodiment of my present invention I provide a plurality of spring-pressed carriers, which hold the molds in spaced relation in the press in its retracted position, and which are adapted to force each mold against the press head immediately above it, when the press is actuated and before the working pressure is applied to the mixture in the mold. The spring-pressed supports automatically accomplish the same results as were accomplished by the manually actuated wedge rods of my previous application and they are so arranged as to be properly governed and controlled by the action of the press itself. Thus, the speed and facility with which the press may be operated is greatly increased and the structure is simplified.

In order that my invention may be thoroughly understood, I will now proceed to describe the same in the following specification, and will then point out the novel features thereof in appended claims.

Referring to the drawings:

Figure 1 is a partially sectional elevation of a press arranged and constructed in accordance with my invention and constituting an embodiment thereof. Certain of the molds are shown in elevation and others partially broken away and shown in section, some being shown filled and others empty in order to clearly illustrate the structure and operation of the press.

Fig. 2 is a partially sectional elevation at right angles to Fig. 1.

Fig. 3 is a partial elevation showing one of the mold supports which is attached to and forms a part of the press.

Fig. 4 is a partially sectional plan view of the body of the press showing one set of spring-pressed supports which is adapted to receive one of the press molds.

Fig. 5 is a section on the line 5—5 of Fig. 4.

Fig. 6 is a plan view of one of the molds, and

Fig. 7 is a transverse section of the same taken on the line 7—7 of Fig. 6.

Fig. 8 is a front elevation of the upper part of the machine and illustrates the steam connection between the press heads.

Fig. 9 is a partial sectional plan view of the machine.

Fig. 10 is a sectional view of a mold and its spring-pressed support, drawn to a relatively large scale.

General description.

The structure illustrated in the drawings comprises a base 15, a plunger 25, a stationary press head 30 at the top, a plurality of intermediate press heads 40, two sets of molds 50, spring-pressed mold supports 60 and two sets of supporting racks which are attached to the respective sides of the press.

Base.

The base 15 is mounted on a pair of adjusting screws 16 which are enlarged at the

bottom to form feet 17 and have nuts 18 which are adapted to be turned to raise and lower the base 15 as a whole.

The base is furthermore provided with a cylindrical recess 19 which constitutes a hydraulic cylinder and is adapted to receive the cylindrical plunger or piston 25. Fluid under pressure is admitted to the cylinder from any suitable source in the usual manner. The plunger or piston is provided with a recess 28 in which cooling fluid may be disposed. The downward movement of the press plunger or piston 25 is limited by the engagement of the bottom of the plunger with stops 29 within the cylinder.

Stationary press head.

The stationary press head 30 has a plurality of perforated corner bosses 31 through which the upper end of heavy studs 32 extend. The studs are screw-threaded at their upper ends to receive nuts 33, the studs constituting tie rods for rigidly connecting the stationary press head to the base and taking the reaction of the press in operation. Bolted to the press head 30, and constituting a part of it, is the steam heated head plate 34 which corresponds in structure and form to the intermediate press heads 40.

Intermediate press heads.

Each of the intermediate press heads 40 has the form shown in Figs. 4, 5, 9 and 10. These are provided with corner brackets 41 which are curved to engage and coöperate with the studs or tie rods 32, the arrangement of parts being such that the press heads float and are free to move up and down parallel to the press movement, being guided by the studs. Each press head has a recess or steam chamber which may be U-shaped and communicates with inlet and exhaust passages 38 and 39. Each of the press heads is formed on the top in such manner as to coöperate with the bottom of the mold above as hereinafter more fully explained. The steam connections are established between molds by short pipes 42 which are joined by swing joints so as not to interfere with the operation of the mold, this arrangement being clearly shown in Fig. 8. Each of the floating press heads has a pair of angle bars 60 with upturned flange 61 resiliently mounted thereon in parallel relation, in position to receive one of the molds 50 as clearly shown in Figs. 2 and 10. The bars have downwardly extending dowel pins 62 which enter holes 63 in the press head on which they are mounted, helical springs 64 being interposed between the head and the bar, and preferably set into spring pockets 65 in the head. The arrangement of parts is such that each mold is resiliently carried on the springs when it is introduced into the press and is in a position slightly below the bottom surface of the press head above. The parts are arranged so that the mold is very readily moved from the mold racks as explained below, into the spring-pressed supports in the press.

Press molds.

Each of the molds 50 comprises a frame or hollow body which may be subdivided as shown, if desired, having a flange 51 to support a removable bottom plate or plates 52. If it is desired to provide for the manufacture of shingles or tiles of different thicknesses or of varying thicknesses from one edge to the other, a plate may be removably secured to each bottom plate 52 and in this case will constitute a form to determine the thickness and shape of the shingle or tile. Where the machine is designed for a uniform product of one kind, the bottom plate 52 may be so constructed as to render any other forming plate unnecessary. Each mold has side projections 53 which are adapted to engage and coöperate with the spring-pressed supporting bars 61. It also has a handle 54 at one end so that it may be readily moved into and out of the press.

Supporting racks.

The press as above described, is operative and one set of molds may be filled and introduced into the press before the press is operated, but I prefer to utilize racks as shown and described in my copending application and, as shown particularly in Figs. 1, 8 and 9 hereof. The racks comprise four frames 70 which are secured near their respective ends to the base 15 and the stationary press head 30. Each of the frames has an inwardly extending flange or projection 71 which is notched to constitute steps 72 on which the edges of the molds rest when the press is retracted. The lowest intermediate press head 40 rests upon the bottom step 72 when the plunger 25 is released and each successive press head above it rests upon the upper steps in succession.

A press head 85 is secured to the plunger so that its upper surface corresponds to the upper surface of each of the floating press heads. The removable bottom plate 52 of each mold is made sufficiently thick, as clearly shown in Figs. 7 and 10, or is otherwise formed, to extend downwardly a considerable distance below the mold frame and consequently when the press is operated the working pressure is exerted entirely on the removable bottom plate.

In order to hold each bottom plate seated on the flange 51, when it is not forcibly raised by the action of the press, I prefer in some cases to provide ledges or projections 75 on the plate and introduce springs 76 between the plate and the mold frame.

These springs are relatively weak and may be omitted entirely if desired.

Operation.

Assuming that the parts occupy substantially the positions shown in Figs. 1 and 2 and that the molds 50 which are carried by the spring-pressed mold supports 60 are filled with concrete mixture from which the slabs or shingles are to be made, hydraulic or other suitable pressure is next admitted to actuate the plunger. Attention is directed to the fact that the spring supports carry the mold in such position (as shown in Fig. 2) that the bottom of the plate 52 clears the top of the press head below and consequently the first upward movement of the bottom press head carries the bottom mold of the series up and clamps or presses it, by the compression of the springs 64, against the bottom surface of the press head above. This action continues until all of the molds are closed, the spring tension being such as to insure that each individual mold is forcibly pressed shut and finally the full hydraulic pressure is applied to the bottom plates 52. This heavy pressure forms the shingle and the heat which is supplied to the press heads by steam or other suitable means and in combination with pressure completely sets and dries the concrete and accomplishes by this means in a very short length of time what requires by other means a very considerable period of time.

When the heat and pressure has been applied sufficiently the hydraulic pressure is released and the springs immediately expand and hold the molds in suspended positions free from both of the adjacent press heads, thus enabling the attendant to quickly and easily pull the molds out into the racks from which they are introduced into the press.

As explained in my copending application already referred to, there are preferably two attendants, one on each side of the press and there are two full sets of molds, each attendant introducing half of his molds at one time; while the press is in action each attendant fills the other half of his share of molds so that they are ready to be introduced as soon as the other attendant pulls out the molds containing the completed shingles.

It is evident that my invention may be embodied in modified structures and while the structures of preferred form and construction have been illustrated and described for the purpose of showing ways in which his invention may be used, the inventive thought upon which this application is based, is broader than these illustrative embodiments thereof, and I therefore intend no limitations other than those imposed by the appended claims.

What I claim is:

1. A press comprising a pair of opposed press heads, one or more immediate floating press heads providing a plurality of mold spaces, resilient means adapted to hold molds in the spaces and yieldingly press them closed when the press is actuated and before the working pressure is applied to the material in the molds.

2. A press comprising a pair of opposed press heads, one or more immediate floating press heads providing a plurality of mold spaces, spring-pressed supports arranged to hold the molds and yieldingly press them closed when the press is actuated and before the working pressure is applied to the material in the molds.

3. A press comprising a pair of opposed press heads, one or more immediate floating press heads providing a plurality of mold spaces, resilient means adapted to hold molds in the spaces and yieldingly press them closed when the press is actuated and before the working pressure is applied to the material in the molds, and means for holding the molds outside the press in position to enter the resilient holding means when the press is released.

4. A press comprising a pair of opposed press heads, one or more immediate floating press heads providing a plurality of mold spaces, spring-pressed supports arranged to hold the molds and yieldingly press them closed when the press is actuated and before the working pressure is applied to the material in the molds, and means for holding the molds outside of the press in position to enter the spring-pressed supports when the press is released.

5. A press comprising a pair of opposed press heads, one or more immediate floating press heads providing a plurality of mold spaces, resilient means adapted to hold molds in the spaces and yieldingly press them closed when the press is actuated and before the working pressure is applied to the material in the molds, stationary racks attached to the sides of the press and adapted to hold the molds outside of the press in position to enter the resilient holding means in the mold spaces when the press is released.

6. A press comprising a pair of opposed press heads, one or more immediate floating press heads providing a plurality of mold spaces, spring-pressed supports arranged to hold the molds and yieldingly press them closed when the press is actuated and before the working pressure is applied to the material in the molds, stationary racks attached to the sides of the press and adapted to hold the molds outside of the press in position to enter the spring-pressed supports in the mold spaces when the press is released.

7. A press comprising a pair of opposed press heads, one or more immediate floating press heads providing a plurality of spaces, supporting bars, resiliently mounted in the mold spaces and forming guideways adapted to receive the molds when the press is released.

8. A press comprising a pair of opposed press heads, one or more immediate floating press heads providing a plurality of spaces, supporting bars resiliently mounted in the mold spaces and forming guideways adapted to receive the molds when the press is released, and adapted to yieldingly press the molds closed when the press is actuated and before the working pressure is applied to the materials in the molds.

9. A press comprising a pair of opposed press heads, a mold support resiliently mounted on one of the press heads and adapted to permit the mold to be closed against the opposed press head before the working pressure is applied to the material in the mold.

10. A press comprising a pair of opposed press heads, a mold support resiliently mounted on one of the press heads and adapted to permit the mold to be closed against the opposed press head when the press is actuated and before the working pressure is applied to the material in the mold.

11. A press comprising a pair of opposed press heads, a mold support resiliently mounted on one of the press heads and adapted to permit the mold to be closed against the opposed press head before the working pressure is applied to the material in the mold, and a mold rack adjacent to the press and arranged to hold a mold in position to enter the resilient support in the mold space when the press is released.

12. The combination of a press having a pair of opposed press heads adapted to approach each other when the press is actuated, a mold adapted to enter the mold space between the press heads and having a removable bottom member extending materially beyond the mold toward the adjacent press head, means for resiliently supporting the mold in the mold space and adapted for pressing the top of the mold against the press head adjacent thereto before the working pressure is applied to the material in the mold.

13. The combination of a press having a pair of opposed press heads adapted to approach each other when the press is actuated, a mold adapted to enter the mold space between the press heads and having a removable bottom member extending materially beyond the mold toward the adjacent press head, means for resiliently supporting the mold in the mold space and adapted for pressing the top of the mold against the press head adjacent thereto when the press is actuated and before the working pressure is applied to the material in the mold.

14. The combination of a press having a pair of opposed press heads adapted to approach each other when the press is actuated, a mold adapted to enter the mold space between the press heads and having a removable bottom member extending materially beyond the mold toward the adjacent press head, spring-pressed guideways for supporting the mold in the mold space and adapted for pressing the top of the mold against the press head adjacent thereto when the press is actuated and before the working pressure is applied to the material in the mold.

In witness whereof, I have hereunto set my hand this 9 day of December, 1918.

CURT R. BURKHARDT.