

R. L. RICKMAN.  
 BLOCK MAKING MACHINE.  
 APPLICATION FILED MAY 12, 1909.

1,056,059.

Patented Mar. 18, 1913.

2 SHEETS—SHEET 1.

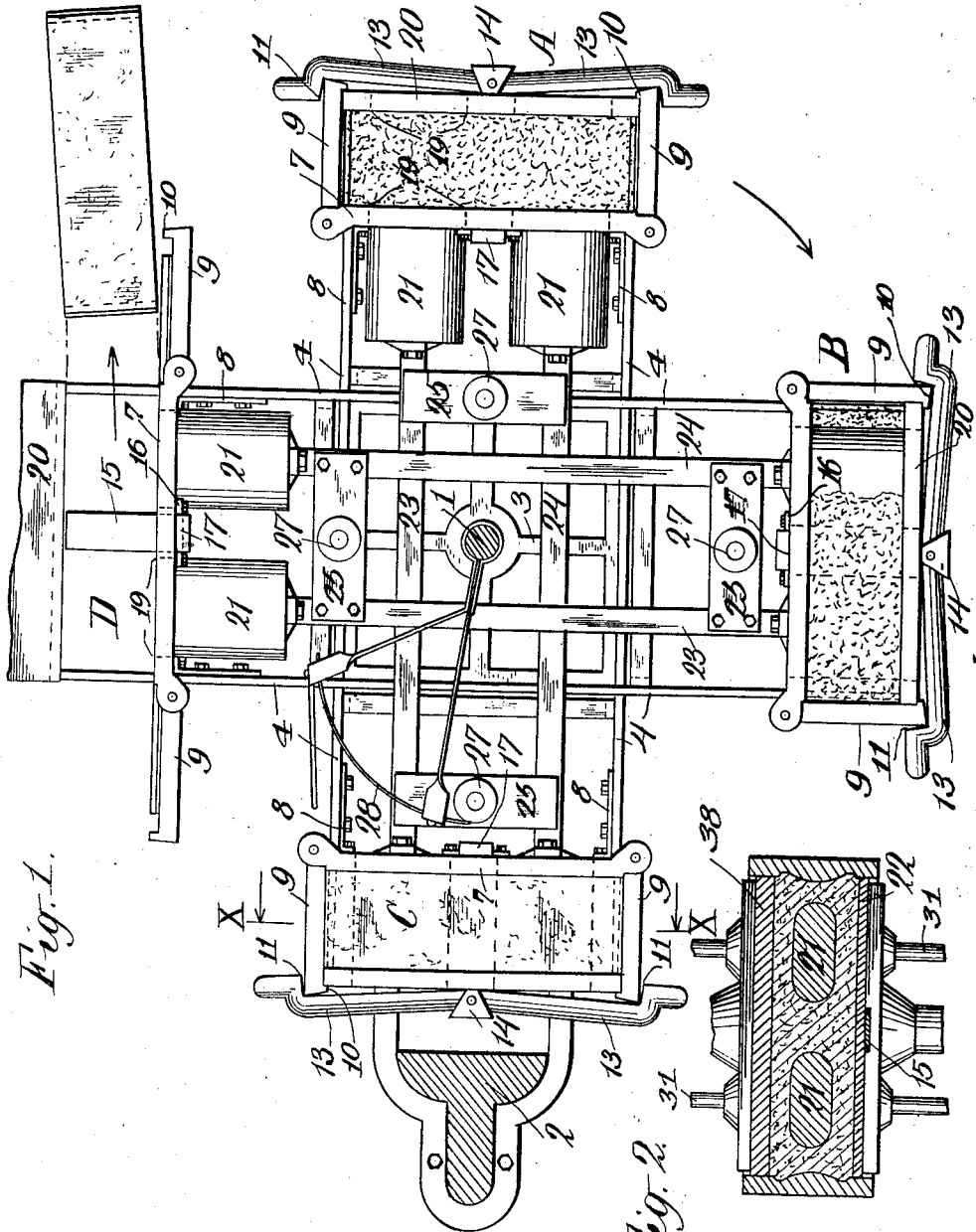


Fig. 1.

Fig. 2.

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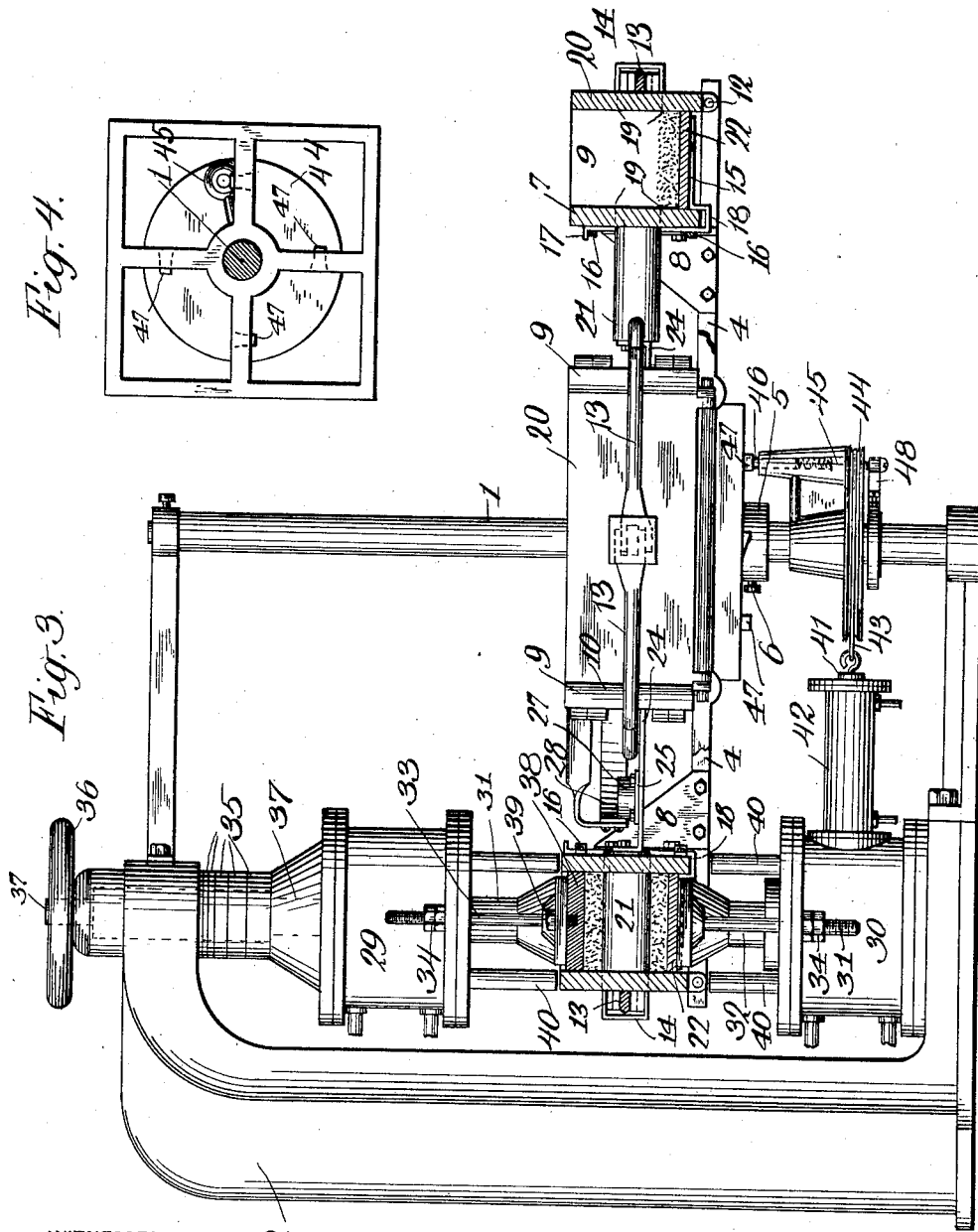


Fig. 4.

Fig. 3.

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# UNITED STATES PATENT OFFICE.

ROBERT LEE RICKMAN, OF VANCOUVER, BRITISH COLUMBIA, CANADA.

## BLOCK-MAKING MACHINE.

1,056,059.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed May 12, 1909. Serial No. 495,484.

*To all whom it may concern:*

Be it known that I, ROBERT L. RICKMAN, a citizen of the United States, residing at Vancouver, in the county of Vancouver, British Columbia, Canada, have invented certain new and useful Improvements in Block-Making Machines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in a machine for forming blocks constructed of plastic or cementitious material and more particularly for forming blocks of this character provided with an opening or openings therein.

One of the objects is to provide a machine of this character by means of which blocks of different thicknesses may be made.

Another object is to provide a machine in which the blocks may be formed with a facing of a different material than that of which the body is composed.

Another object is to provide a machine of this type which will be efficient in operation and which will have a maximum capacity.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is shown one of various possible embodiments of the invention, Figure 1 is a top plan view, parts of the press being broken away for the sake of clearness; Fig. 2 is a sectional view taken on the line  $x-x$  of Fig. 1 and showing the rams in pressing position; Fig. 3 is a side elevation of the apparatus shown by Fig. 1 showing the arrangement and disposition of the ram mechanism and illustrating in section two oppositely located mold boxes; and Fig. 4 is a detailed view illustrating the rotating mechanism.

Referring to the drawings, in which similar reference numerals indicate similar parts throughout the several views 1 indicates a vertical column supported in any suitable manner by the rigid stationary frame 2. Rotatably mounted upon this column is the

rotating frame of the machine which preferably comprises a central portion 3 to which the mold box arms 4 are secured in any suitable manner. This rotating frame preferably rests upon a vertically adjustable collar 5 (see Fig. 3) secured to the column as by a set screw 6 by means of which the frame may be adjusted upon the shaft to any desired height. The mold boxes are secured to the outer extremities of the mold box arms 4 and as these boxes are alike in all respects, but one will be described.

Each mold box comprises a back plate 7 rigidly secured to the mold box arms 4 in any suitable manner, as by means of brackets 8. End plates 9 are pivotally secured to the back plate adjacent the extremities thereof and are adapted to be swung outward as indicated in Fig. 1. The free ends of the end plates are provided with lugs 10 adapted to engage the front plate 20 and hold the same in position when the mold box is closed, said front plate being preferably pivoted at its lower edge to the mold box arms 4, as indicated at 12 in Fig. 3. Upon the outer surface of the front plate and preferably at the center thereof swinging locking arms 13 are hinged, which arms provide offset portions or catches 11 adjacent their ends so that when the box is in its closed position such portions may engage the outer surface of the end walls 9 whereby the parts of the box are held in their assembled positions. A suitable stop 14 is preferably provided to limit the outward movement of these locking arms. Slidingly mounted upon the rear surface of the back plate is the pallet rest 15 preferably formed of steel plate and held in position by suitable straps 16 which may be secured to the back plate. A lug 17 limits the downward movement of said pallet rest and its upward movement is limited by means of the bent portion 18 which is adapted to engage the lower edge of the back plate. The front (20) and back (7) plates are provided with one or more registering oval openings 19 respectively to receive suitable cores 21 as hereinafter described. A movable pallet 22 rests upon the upper surface of the pallet rest during the forming of the block, as plainly indicated in Fig. 3.

Extending between oppositely disposed mold boxes are the core arms 23 and 24 (braced by roller supporting cross-rods 25)

which are reciprocatably mounted upon the mold box arms 4 in any suitable manner. The cores 21 are secured to the free ends of these reciprocating core arms and are so mounted as to be in registry with the openings 19 formed in the back and front plates of the mold boxes whereby, upon the reciprocation of the core arms, said cores will be alternately inserted within and withdrawn from the mold boxes. The core arms and cores are so proportioned that when the cores upon one end of the arms are inserted within their associated mold boxes, the cores upon the other end of said arms will be withdrawn from their associated boxes as is plainly indicated in Fig. 1. Each cross rod 25 carries a cam engaging member 27 adapted, as the frame is rotated in the direction indicated by the arrow in Fig. 1, to contact with the curved surface of cam 28 which may be secured to the vertical column 1 in any suitable manner.

The mold boxes are adapted to be successively inserted between the rams of a suitable press which is preferably mounted upon the frame 2 which press may be of any well known type, preferably being of the hydraulic type and comprising upper and lower cylinders 29 and 30 within which the upper and lower rams 31 and 32 are adapted to reciprocate, said rams being preferably guided in their movement by upper and lower guide rods 33 freely passing through the flanges of the cylinders and being supplied with adjustable means to limit the travel of the rams, as, for example, the nuts 34 engaging the upper threaded portions of said guide rods. The lower cylinder 30 of the press is preferably secured to the base, but the upper cylinder 29 is bodily shiftable at will with respect to the rigid frame 2 and is provided with adjustable means whereby the distance between it and the lower cylinder may be varied. As shown said means comprises a plurality of removable, split rings 35 adapted to be placed between said cylinder and the frame, and by removing or inserting a number of said rings between the cylinder and the frame the position of said cylinder may be varied at will, it being held in position by any suitable means, as, for example, by the hand wheel 36 engaging the threaded upper, reduced end of the stem 37. The upper ram is preferably provided with a face plate 38 which may be secured thereto by bolts 39. Stud 40 are preferably provided for preventing vertical movement of the mold box while the press is being operated. The press is, of course, operated in the usual manner by an operator preferably stationed adjacent thereto, and the rotation of the frame may also be controlled by said operator from this point, said rotation being accomplished by means of the reciprocating member 41 mounted within the cylin-

der 42 which is preferably, for convenience, secured to the lower cylinder 30 of the press, but which does not communicate therewith. As the member 41 reciprocates it will, through the medium of the flexible member 43, rotate the disk 44 which is loosely supported by column 1 and carries a boss 45 within which the spring-pressed pawl 46 is mounted, said pawl being in the path of and adapted to engage the lugs 47 secured to the lower surface of the main frame. In the instance shown, in which by way of example four mold boxes are employed, the parts are so positioned that the movement of the reciprocating member 41 from its outer to its inner position will cause the frame to be rotated through an arc of 90 degrees or one-quarter of a revolution. As the reciprocating member moves outward the disk 44 will be rotated in the opposite direction by means of a suitable spring 48 thereby carrying the pawl 46 into engagement with the next succeeding lug 47, said pawl being depressed by the slanting portion of said lug as it passes the same, after which the spring will force it up into engagement with the rear wall of said lug in preparation for the next movement of the reciprocating member 41.

The operation, which should be largely obvious from the above description, is as follows: Starting with the mold box at "station" A as shown in Fig. 1, the operator at said "station" will assemble the box, place the pallet in position upon the pallet rest, which is in its lowered position, and fill the mold box with the material of which the block is to be formed until the material reaches the lower edges of the core openings formed in the front and back plates, the cores being withdrawn as indicated in Fig. 1. The operator at "station" C will now operate the rotating mechanism, thus rotating the frame and carrying the partially filled mold box to the position indicated at "station" B and during this movement of the frame the cam engaging member 27 adjacent the cores which are opposite to said box will have engaged the curved surface of the cam 28, thus causing the cores associated with the partially filled box to be inserted in position as indicated in Fig. 1. The operator at "station" B will complete the filling of the mold box, and if desired the upper portion thereof may be filled with a layer of material of a different character than that of the body portion in order to provide a suitable facing for the block. The operator at C will now rotate the frame another quarter of a revolution thereby bringing the completely filled mold box between the rams of the press after which he will cause the press to operate, as indicated in Fig. 3, thus pressing the block. This press has a variable throw, being, as before stated,

preferably of the hydraulic type, and due to this elastic type of press, the material in the mold, will be compressed to a uniform density irrespective of variations in the amount of material in the mold box. The rams are then withdrawn and the operator at C rotates the frame another quarter of a revolution, the mold box then arriving at "station" D at which point the operator there stationed will release the locking arms 13, thus permitting the front and end plates to be opened as indicated in Fig. 1, after which he will remove the pallet and the formed block resting thereon and make any suitable disposition of the same for the purpose of permitting said block to become dry and hard. It will be noted that as the mold box passes from "station" C to "station" D the cam engaging means 27 adjacent the cores associated therewith will contact with the cam surface 28, thus causing said cores to be withdrawn from the formed block. It will, of course, be understood that in practice this cycle is being constantly carried on; that is to say, each operator at each station will perform his specific work after each partial rotation of the frame.

If desired the inner surfaces of the end plates 9 may be given any suitable configuration, as, for example, that indicated in Fig. 2 by means of which blocks having recesses are formed, which recesses, when the blocks are assembled in a wall, will form a recess for holding the pointing key and materially assist in the laying of the blocks.

By constructing the blocks face up the same pallet may be used for any thickness of block, and as the openings formed by the cores extend parallel with the pallet, the block will not have to be turned over after it is formed to allow it to dry, as the steam vapor or other heating medium may circulate freely through said openings while the block is in this position. By applying pressure upon the upper and lower surfaces of the material, both sides of the block will be pressed alike, which is a distinct advantage over blocks where the pressure is applied to one side only.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense. It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

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

1. An apparatus of the nature disclosed comprising, a frame, an upright mold-box plate rigidly secured thereto, a second normally upright mold-box plate hinged to said frame and adapted to be swung toward a horizontal position, a pair of pivotally mounted end-plates adapted to be swung away from one another, means for locking said plates together, and a bottom plate slidably supported by said rigid upright plate.

2. An apparatus of the nature disclosed comprising, a frame, an upright mold-box plate rigidly secured thereto, a second normally upright mold-box plate hinged to extensions of said frame and adapted to be swung toward a horizontal position, a pair of pivotally mounted end-plates adapted to be swung away from one another, means for locking said plates together, and a bottom plate resting on a member slidably supported by said rigid upright plate.

3. An apparatus of the nature disclosed comprising, a frame, an upright plate rigidly secured to said frame and forming a back member of a mold-box, a second normally upright plate hinged to extensions of said frame and forming the front member of the mold-box, a pair of end-plates forming sides of said mold-box, said end-plates being hinged to the ends of said rigid plate, catches for locking said plates together, an L-shaped member having its upturned leg slidably secured to said rigid plate, and a bottom plate resting on the horizontal leg of said L-shaped member.

4. An apparatus of the nature disclosed comprising in combination, a rotatable frame, an upright plate rigidly secured to said frame and forming a back member of a mold-box, said upright plate having an aperture for enabling a core to be inserted and withdrawn, a second normally upright plate hinged to extensions of said frame and forming the front member of the mold-box, a pair of end plates forming the sides of said mold-box, said end plates being hinged to the end of said rigid plates, catches for locking said plates together, an L-shaped member having its upturned leg slidably secured to said rigid plate, a bottom plate resting on the horizontal leg of said L-shaped member, and means for automatically inserting and withdrawing said core as said rotatable frame travels through predetermined stations.

5. An apparatus of the nature disclosed comprising a series of mold boxes, means adapted to move the boxes in an endless path from one station to another, a core for each box, a press at one station adapted to exert pressure on the material in the boxes when

- at that station, means controlled by the movement of the boxes adapted to move the cores either into or out of the boxes as the boxes move and to dispose the core at the press station in the mold box.
- 5 6. An apparatus of the nature disclosed comprising a series of oppositely disposed pairs of mold boxes, means adapted to move the boxes in an endless path from one station to another and cause them to rest at the stations, a core for each box, the cores being oppositely connected in pairs, a press at one station, adapted to exert pressure on the material in the boxes when at that station, means adapted to move the cores either into or out of the mold boxes as the boxes move and to dispose the core at the press station in its mold box and the core connected there-  
10 out of its box.
- 15 7. An apparatus of the nature disclosed comprising a series of oppositely disposed pairs of mold boxes, means adapted to move the boxes in an endless horizontal path from one station to another and cause them to rest at the stations, the boxes having verti-  
20 cally movable bottoms, a core for each box, the cores being oppositely connected in pairs, a press at one station adapted to exert elastic pressure on the material in the boxes transverse to the plane of movement of the boxes, means adapted to move the cores either into or out of the boxes, as the boxes move and to dispose the core at the press station in its mold box and the core connect-  
25 ed thereto out of its box.
- 30 8. An apparatus of the nature disclosed comprising two oppositely disposed pairs of mold boxes arranged 90° apart, means adapted to move the boxes in an endless path from one station to another and cause them to rest at the stations, a core for each box, the cores being oppositely connected in pairs arranged 90° apart, a press at one station, means adapted to move the cores either into or out of the boxes as the boxes move and to dispose the core at the press station in the mold box, the core opposite thereto out of its box, and the remaining cores in and out of their boxes, respectively.
- 35 40 45 50 55 60 65 9. An apparatus of the nature disclosed comprising two oppositely disposed pairs of mold boxes arranged 90° apart, means adapted to move the boxes in an endless horizontal path from one station to another and cause them to rest at the stations, the boxes having vertically movable bottoms, a core for each box, the cores being connected in pairs arranged 90° apart, a press at one station adapted to exert elastic pressure on the material in the boxes transverse to the plane of movement of the boxes, means adapted to move the cores either into or out of the boxes as the boxes move and to dispose a core of each pair in their respective boxes at two consecutive stations.
10. An apparatus of the nature disclosed comprising two pairs of mold boxes, means adapted to move the boxes in an endless path from one station to another, a core for each box, a press at one station, and means adapted to dispose a core of each pair simulta-  
70 neously in or out of their respective boxes at two stations.
11. An apparatus of the nature disclosed comprising two pairs of mold boxes, means adapted to move the boxes in an endless path from one station to another, a core for each box, a press at one station, and means adapted to dispose one core of each pair in its respective box and the other core of each pair out of its respective box at the stations.
- 75 80 12. An apparatus of the nature disclosed comprising a series of oppositely disposed pairs of mold boxes, means adapted to move the boxes in an endless path from one station to another, a core for each box, means connecting the cores in pairs, and means whereby, as the boxes move each pair of cores is so moved relatively to its pair of boxes as to dispose one core of one pair in its box and the other core of that pair out of its box at opposite stations.
- 85 90 95 100 105 13. An apparatus of the nature disclosed comprising a series of oppositely disposed pairs of mold boxes, means adapted to move the boxes in an endless path from one station to another, a core for each box, means connecting the cores in pairs, a fixed cam, and devices carried by each pair of cores adapted to cooperate with said cam whereby as the boxes move each pair of cores is so moved relatively to its pair of boxes as to dispose one core of one pair in its box, and the other core of that pair out of its box at opposite stations.
- 110 115 120 125 130 14. An apparatus of the nature disclosed comprising a rotary frame, a series of oppositely disposed pairs of mold boxes carried thereby, means for intermittently rotating said frame in an endless horizontal path from one station to another, each box having an opening in its vertical wall, a core for each box, rods joining the cores in pairs, and guided on said frame, a fixed cam track, and a plurality of rollers carried by each pair of cores adapted to contact the cam track and move each pair of cores relative to its respective pair of boxes as the frame rotates.
15. An apparatus of the nature disclosed comprising a rotary frame, a series of oppositely disposed pairs of mold boxes carried thereby, means for intermittently rotating said frame in an endless horizontal path from one station to another, each box having a plurality of openings in its vertical wall, a plurality of cores for each box, a frame connecting the cores in oppositely disposed pairs, a fixed cam track, and a plurality of devices on each frame adapted to cooperate

with the cam track and move each oppositely disposed pair of cores.

16. An apparatus of the nature disclosed comprises a series of oppositely disposed 5 pairs of mold boxes, means adapted to move the boxes in an endless horizontal path from one station to another, a core for each box, means connecting the cores in pairs, a press at one station, means adapted to substan- 10 tially prevent vertical movement of the mold boxes at the press station, said boxes having

vertically movable removable bottoms, and means whereby as the boxes move a pair of cores is moved relatively to its pair of boxes so as to dispose one core in the box at the 15 press station.

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

ROBERT LEE RICKMAN.

Witnesses:

A. E. GALPIN,  
J. P. THORNE.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."

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