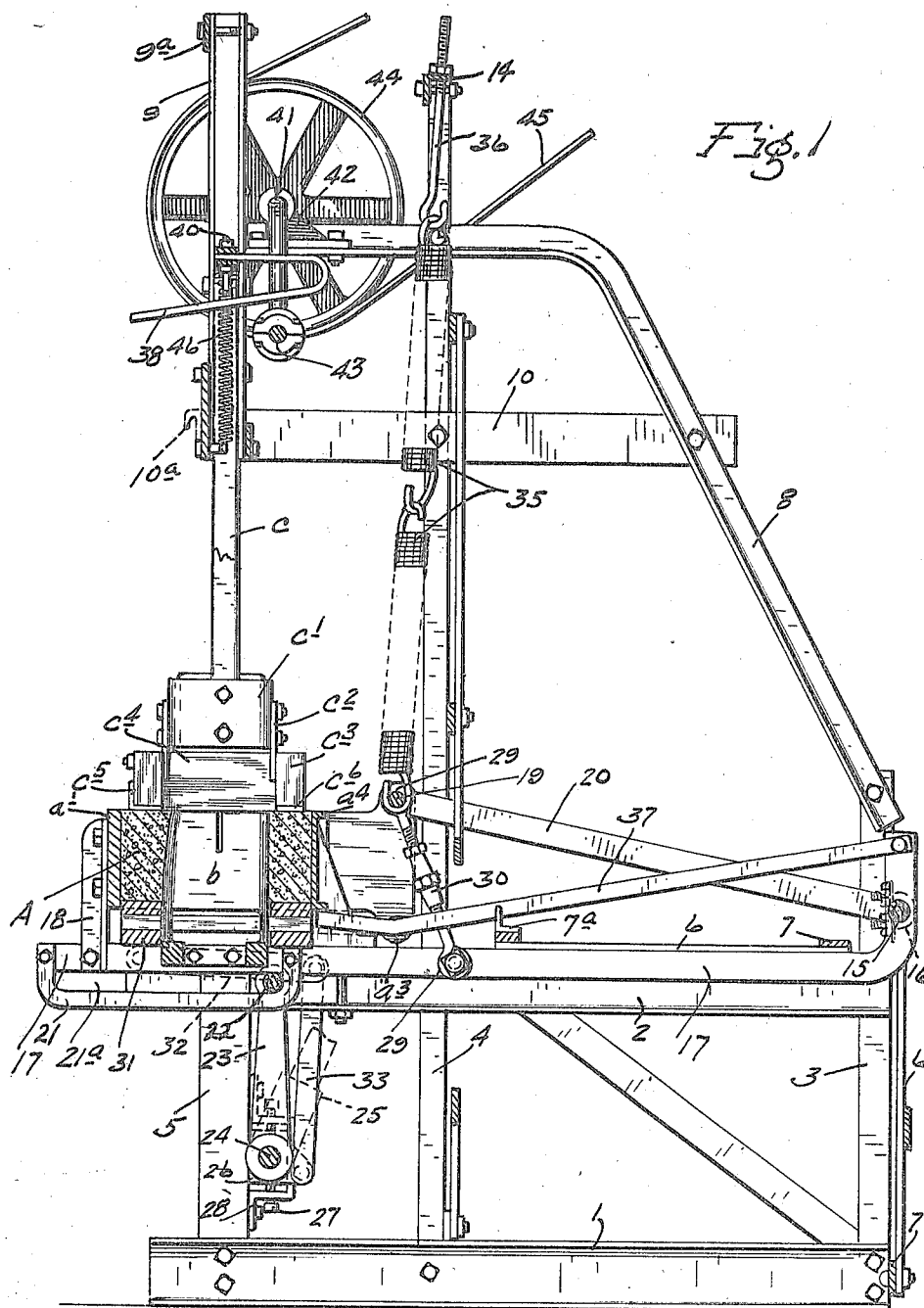


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CONCRETE BLOCK MAKING MACHINE.
FILED JUNE 11, 1921.

1,442,967.

4 SHEETS—SHEET 1.



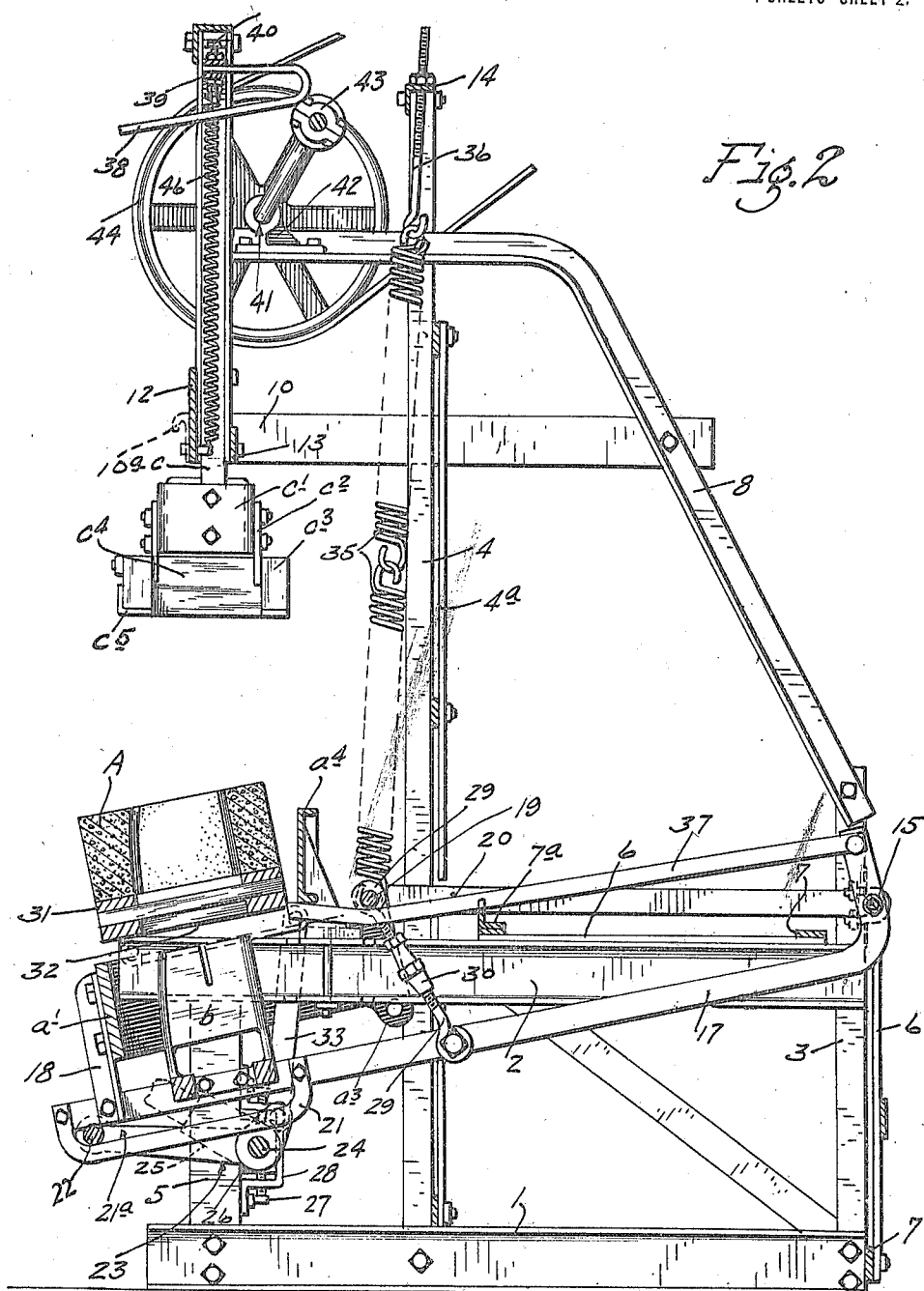
INVENTOR
GODFREY W. Papke
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James F. Williamson

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4 SHEETS—SHEET 2.



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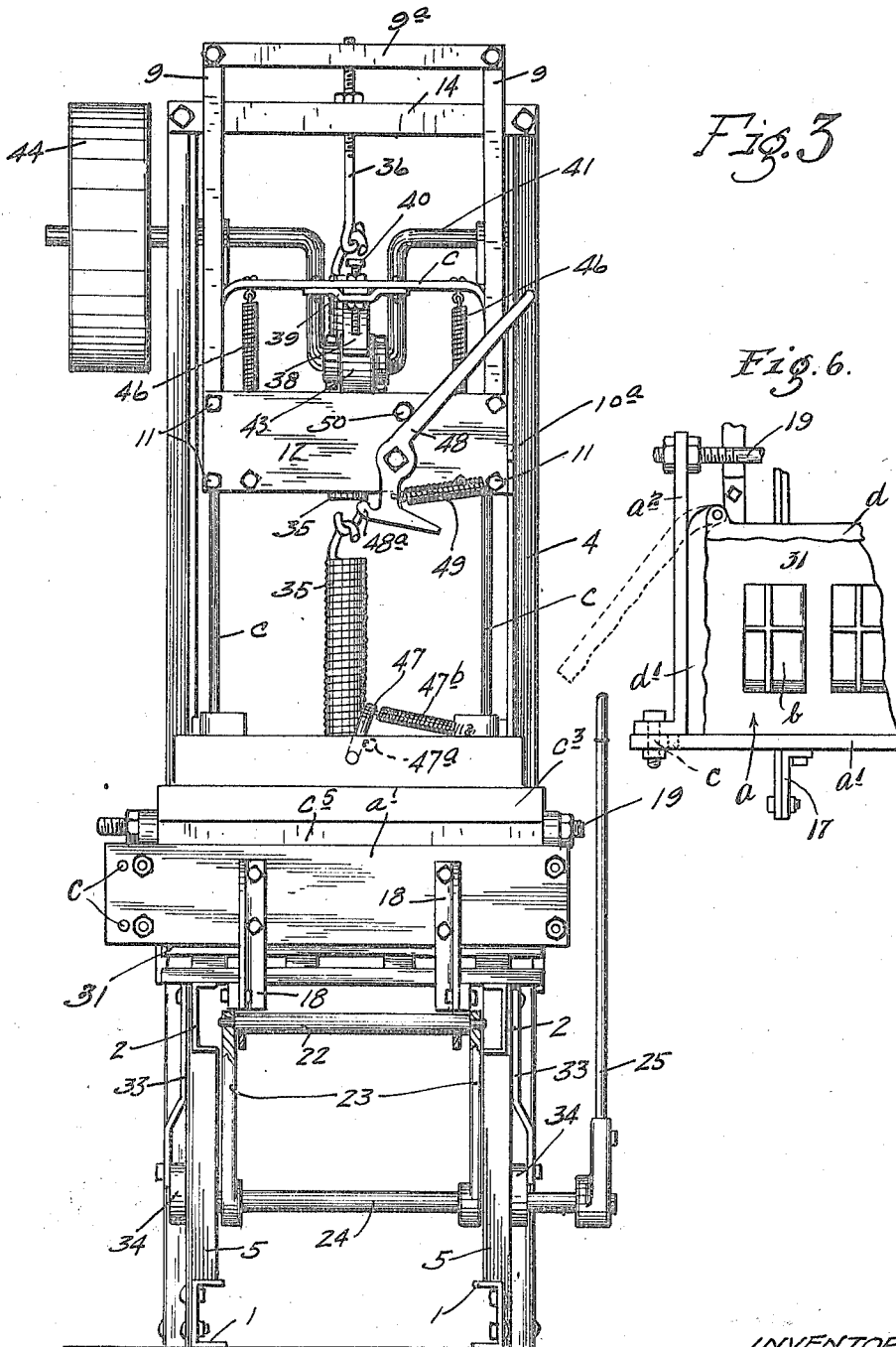
James F. Williams.

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4 SHEETS—SHEET 3.



INVENTOR
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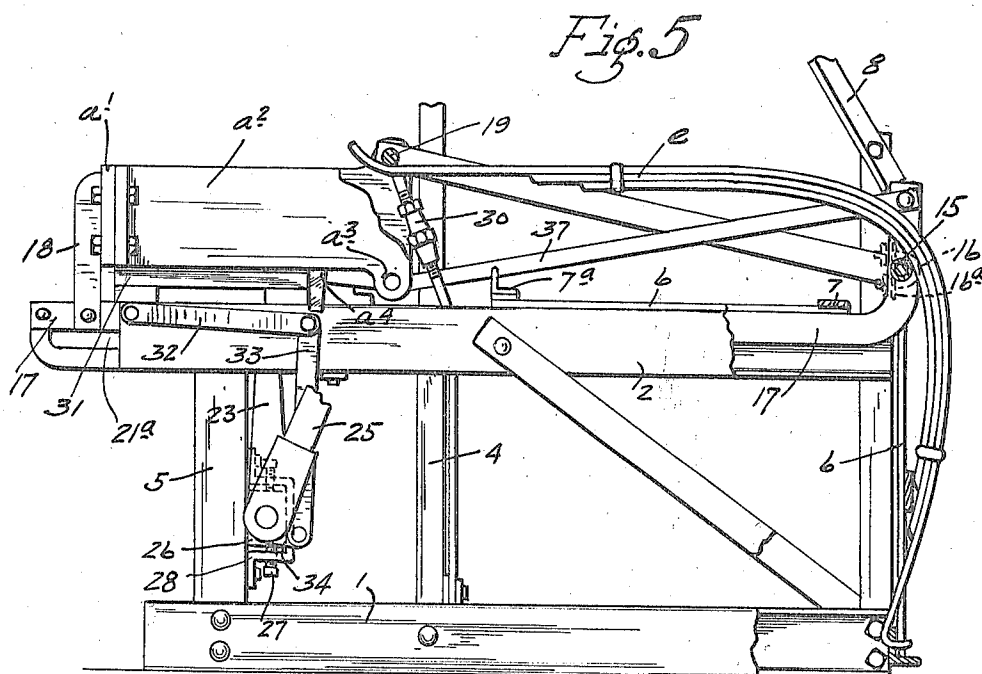
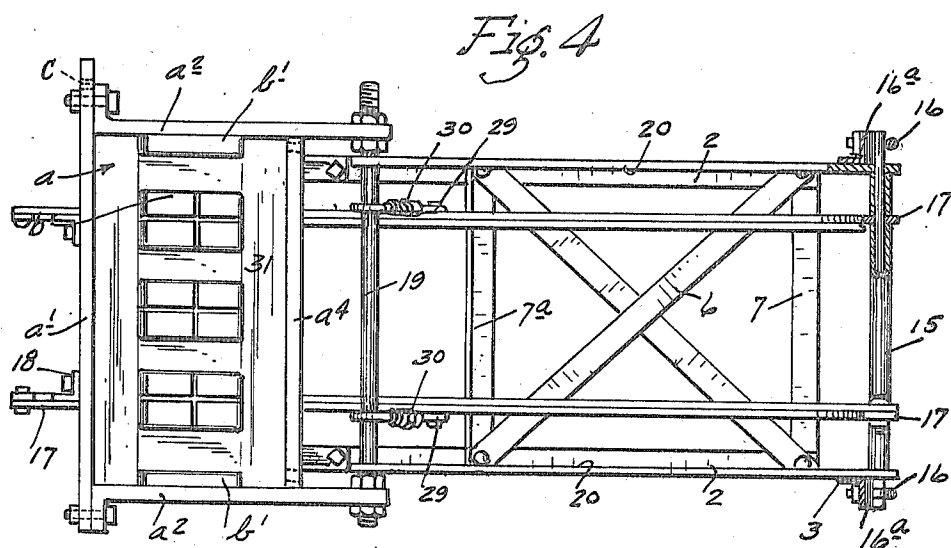
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

GODFREY W. PAPKE, OF MINNEAPOLIS, MINNESOTA.

CONCRETE-BLOCK-MAKING MACHINE.

Application filed June 11, 1921. Serial No. 476,774.

To all whom it may concern:

Be it known that I, GODFREY W. PAPKE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Concrete-Block-Making Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to concrete molding machines, and particularly to such a machine designed to mold cored concrete blocks.

It is an object of this invention to provide such a machine of simple construction and yet which will work rapidly and efficiently to produce such blocks, and one improvement therein consists in an improved means for raising the tamper element used and for propelling the same in its downward movement.

It is a further object of the invention to provide such a machine having very efficient supporting means for the swinging mold box, which means are so constructed that the same will not sag during use, and thus let the mold box move to improper position.

It is still another object of the invention to provide a novel means for raising the pallet and molded block when the mold box swings downwardly.

Other objects comprise providing a novel mechanism for moving the mold box upwardly, which means, together with the supporting means, is provided with adjustments for accurately locating the mold box, and adjustable means is also provided for accurately determining the width of the mold box.

These and other objects of the invention will be fully set forth in the following description made in connection with the accompanying drawings in which like reference characters refer to the same parts throughout the different views, and in which:

Fig. 1 is a central longitudinal vertical section through the machine;

Fig. 2 is a similar section showing the parts in a different position;

Fig. 3 is a view in front elevation of the machine, a portion thereof being shown in section;

Fig. 4 is a section taken on the line 4—4 of Fig. 1, looking downwardly;

Fig. 5 is a partial view in side elevation showing a modified form of the machine; and

Fig. 6 is a partial plan view showing an attachment.

Referring to the drawings, a frame is provided comprising a pair of longitudinally extending spaced channel members 1, above which is a pair of spaced similar channel members 2. These channel members have their channels directed inwardly and one of each pair is located at each side of the machine. The channel members are connected at the rear by vertical members 3 and intermediate the ends of said channels, vertical angle members 4 extend upwardly at each side of the machine. At their front portions the channel members are also connected by vertically extending members 5. The channel members are also further connected and braced by crossed brace members 6 at the rear and top and horizontal members 7 also extend between the same. The members 4 extend above the upper channel member 2 and angle members 8 located at each side of the machine are bolted to the members 3 at their lower ends and extend forwardly and upwardly therefrom and have their upper portions bent horizontally and bolted to the members 4. The upper horizontal portions of the members 8 extend forwardly beyond the members 4 and vertically extending channel members 9 are bolted thereto at each side of the machine and extend downwardly therefrom and are bolted at their lower ends to the front ends of brace members 10. The members 10 extend horizontally forward from the members 8 to the members 9 and are suitably bolted to the members 4 and 8. The members 9 are connected at their upper ends by an angle member 9^a suitably bolted thereto. Spaced headed and nutted bolts 11 extend through the sides of the channel members 9 and a front plate 12 and a narrower rear plate 13 are bolted to said channel members thereby. The members 4 are connected at their top portions which extend above the horizontal portions of members 8 by an angle member 14 which is bolted at each end to said members. The members 4 are suitably braced intermediate their length between the members 2 and 8 by transversely extending brace members 4^a. An angle member 7^a extends across between the channels 2 at the upper side thereof at the front of member 6 and

said angle member is provided at spaced points with slots for a purpose to be later described.

A rounded bar 15 extends across the rear of the machine back of the members 3 to which it is secured by means of U-shaped clips 16. Suitable shim plates 16^a are disposed between the bar 15 and the surface of the bars 3 for a purpose to be later described. Pivoted to the bar 15 at each side of the machine a short distance inside the channel member 2 are the supporting bars 17. These bars are provided with a short substantially vertical portion which is pivoted to the bar 15, and below said bar the members 17 are bent substantially at a right angle and extend forwardly to the front of the machine where they have bolted to their inside portions the vertical angle members 18 forming the supports for the front and side portions *a*¹ and *a*² of the mold box *a*. The front portion *a*¹ of this mold box is a plane rectangular member extending across the front of the same and the side members *a*² have laterally projecting flanges secured to the ends of this front portion by headed and nutted bolts. The side portions *a*² extend backwardly and are formed at their rear ends by oppositely disposed lugs *a*³ projecting upwardly and downwardly from their rear edges and thus forming a symmetrical structure. A rod 19 extends across between the upper lugs *a*³ on the members *a*² and has its ends threaded and secured in said lugs by nuts disposed at each side thereof, and rigid links 20 are pivoted to the rod 19 above the channel member 2 and extending rearwardly and are pivoted to the rod 15. Tubular spacing members 15^a on rod 15 hold members 17 and 18 in proper relation.

The mold box *a* is thus supported by both the members 17 and 20 extending longitudinally of the frame at each side thereof, which members form a truss structure firmly holding the said box in proper position. Bolted to the inside of each member 17 at its outer end is an elongated U-shaped member 21 forming with the member 17 a slot 21^a, and a roller member 22 having its reduced ends journaled in the ends of the arms 23, extends between the members 17 and 21 and travels in said groove 21^a. The arms 23 are provided at their other end with hubs secured to a shaft 24 extending between the frame members 5 and to one end of which is secured a handle lever 25 for swinging the shaft 24 and the arms 23. From this structure it is seen that when the lever 25 is swung the arms 23 will carry roller 22 upwardly and the arms 17 will be swung up to the position shown in Fig. 1. The shaft 24 is journaled in blocks 26 which are supported by set screws 27 extending through the top and bottom of clips or U-shaped

brackets 28 bolted to the rear sides of members 5. The block 26 can thus be raised or lowered slightly by adjustment of the set screws 27. Castings forming the cores *b* are bolted to the inside of the member 17, and removable end cores *b*¹ are also placed in position immediately adjacent the molded box sides *a*². The front surfaces of the core members *b* and *b*¹ are formed concentric with the center of rod 15. The bars 17 are connected intermediate their ends to the shaft 19 by pairs of eye-bolts 29 having their threaded ends connected by a turn buckle 30.

A pallet member 31, usually made of wood, is adapted to fit over the core members *b* and *b*¹, and is normally placed in position resting on top of the members 2. This pallet, when the mold box is in normal position, fits within the same and abuts against the face of the rear mold box wall *a*¹. The member *a*¹ extends across between the members 2 and is provided with rearwardly extending feet or lugs, preferably made integral therewith, and headed and nutted bolts pass through apertures in these lugs and through holes provided in the sides of the channel member 2 to firmly secure said member *a*¹ to said channel members. A plurality of holes are provided in the members 2 so that the rear wall *a*¹ can be placed in various positions to make various widths of blocks. A lifting mechanism is provided for the pallet 31 which comprises substantially horizontal links 32 having their front ends adjacent and pivoted to the front ends of the members 2 at the outside thereof, and having their other ends projected rearwardly of the members 2 and pivoted to the upper ends of links 33. The latter links extend downwardly and are given a slight outward bend and their lower ends are, in turn, pivoted to the outer ends of crank arms or eccentrics 34 secured to the shaft 24 just outside of the members 5. It will be seen that when the shaft 24 is swung by lever 25 the crank arms or eccentrics 34 will swing the links 32 and 33 to the position shown in Fig. 2. A spring 35, herein shown as being in two sections, is connected to the rod 19 at its lower end and to a hook bolt 36 at its upper end, the threaded end of which bolt extends through the angle members 14 and is adjustably secured therein by a nut threaded onto the end thereof. The lower edge of the rear wall *a*¹ is spaced from the upper surface of the members 2, as clearly shown in Figs. 1 and 2, and a pair of rods 37 are pivoted at one end to the upwardly extending vertical portions of the member 17 and extend downwardly and forwardly therefrom, being guided in the slots formed in the angle members 7^a heretofore referred to and have their front ends bent slightly upwardly and terminating beneath the wall *a*¹. A tamper is provided for the mold box *a* and comprises a yoke member *c* made of a flat

bar, the horizontal portion of which extends between the channel members 9 and the vertical portions of which fit and slide within the channels 9. Inwardly turned channel pieces c^1 are secured to the lower ends of the yoke c by headed and nutted bolts and side plates c^2 extend between the channel members c^1 at each side thereof, being also bolted thereto. A frame comprising front and rear members c^3 and end members c^4 is bolted to the lower portions of the plate c^2 , which frame is preferably made of wood and is reinforced at its front lower edge by the angle member c^5 and at its rear portion by the plate c^6 . To the upper central portion of the yoke c and to the inside thereof is secured a reversely bent bar 38, the free end of which projects forwardly in front of said yoke. The member 38 is secured by a small yoke 39 suitably bolted to the member c and a bolt 40 provided with suitable adjusting nuts passes through the member c and the members 38 and 39 with its lower end in alinement with the member 38. The member 38 is made of somewhat resilient material and is adapted to be flexed in the operation of the machine.

A crank shaft 41 is journaled in suitable bearings 42 bolted to the members 8 and has its central portion formed as a U-shaped crank arm, to the central portion of which is bolted a contact piece 43 adapted to contact in operation with member 38. The shaft 41 extends at one side of one of the frame members 4 and a pulley 44 is secured thereto adapted to receive a suitable belt 45. Spaced extension springs 46 are fastened at one end to the sides of the horizontal arms of the yoke c and are secured at their lower ends to bolts extending inwardly and rearwardly from the lower edge of the plate 12.

A hook member 47 is secured to the top of the tamper member and when the same is raised it is adapted to engage over the hook portion 48^a of a hook lever 48 pivoted intermediate its length to the front surface of the plate 12. The hook member 47 is normally held in position against a stop 47^a by spring 47^b. The hook portion 48^a of this lever is normally bolted to one side by a tension spring 49 secured thereto and to the plate 12. When the lever 48 is not engaged with the hook 47, it is held against a stop 50 by the spring 49, which stop limits its swinging movement. One of the members 10 is provided at its front end portion with a hook 10^a beneath which the handle portion of lever 48 is adapted to be disposed when the tamper is to be held in its upper and operative position.

The operation of the machine is as follows:

There will be provided a plurality of the plates a^1 forming the rear wall of the mold box, which plates may be given different con-

figurations of surface, if desired, representing natural rock faces. A plurality of different sets of cores will also be provided which will be suitable for different widths of blocks. The members a^4 will be bolted in the desired holes in the channel members 2 to form the desired width of block. If the block is not exactly of the width desired, an adjustment can be made by means of the shim plates 16^a to move the front walls a^1 of the mold box backward slightly to bring the size of the mold and molded block to exactly the dimensions desired. The pallet 31 will now be placed in the mold box a on the members 2, and the members 17, together with the mold box will be disposed in the position shown in Fig. 1. The concrete will now be shoveled into the mold box about the cores until the same extends slightly above the top of said box. During this operation, the tamper has been held in its upper position, which is somewhat higher than the position shown in Fig. 2, and the handle of lever 48 has been hooked under the hook 10^a. When in this position, the member 38 is above the path of the contact member 43 and the pulley 44 can revolve without the tamper being operated. It now being desired to operate the tamper, the handle of lever 48 is released from the hook 10^a and will swing almost to the position shown in Fig. 3, but still supporting the tamper by hook 47. The tamper thus moves slightly downwardly and the member 38 comes into the path of the member 43 which is revolving with the crank arm of crank shaft 41. As the member 43 passes through the upper part of this movement, it raises the tamper and hook 47 and disengages the latter from hook 48^a. Spring 49 then immediately retracts the lower end of the lever 48 to the position shown in Fig. 3, in which position it will clear the hook 47. The tamper is then carried up by the contact member 43 and is allowed to drop when said member passes out of contact with member 38. This lifting and dropping of the tamper will be repeated quite a few times until the concrete is sufficiently packed into the mold box. The operator will then again take hold of the lever 48 and swing the same inwardly into the path of hook 47 and when said hook is engaged with the hook 48^a he will swing the lever 48 down and again hook the handle of the same into the hook 10^a. After the tamping, the top of the block A is struck off even with the top of the mold box, and the lever 25 is then swung forwardly. This permits the bars 17 and the front and sides of the mold box, together with the core members, to swing downwardly out of contact with the pallet and the block A. As the shaft 24 turns, the crank arms 34 are also turned and the links 32 and 33 brought to the position shown in Fig. 2, thus lifting the pallet 31 slightly from the members 2. Also,

as the bar 17 swings downwardly the bars 37 all move forwardly and the said platen 31 is pushed forwardly away from the rear mold box wall a^4 . It may be noted that if the wall a^4 is used having its surface formed with projections simulating a rock face, the links 33 will be disconnected from crank arms 34 so that the link lifting motion will not be used. Such a lifting motion would shear off and mutilate the rock face formed in the block A.

Adjustments must sometimes be made to bring the top surface of the mold box portions a^1 and a^2 to the right height from the pallet 31. This adjustment is sometimes necessitated by the wear in the bearings of shaft 24. Such adjustment can be made by varying the position of the block 26 by the screws 27. In order to then have the top surface of the side portions a^1 flush with the top surface of the rear wall a^2 , the turn buckle links comprising members 29 and 30 must be adjusted. This latter adjustment is used to bring the top portions of the mold box all in the same plane, as stated, and to bring the same to a level or horizontal position.

It will be noted that the mold box portions a^1 and a^2 are reversible and invertible either as a unit or as separate parts. The top edge of the front wall a^1 is often worn by the contact with the trowel as the concrete is evened off flush with the said edge and it is often desirable to invert the front wall member.

By the provision of spring 35 the weight of the moving mold box parts is almost entirely taken off of the roller 22 and the said parts can then be moved upwardly into normal position by said roller with very little wear on the same.

The tamper yoke c is raised by a head 43 through the yieldable member 38 and the shock of such sudden lifting is thus greatly relieved. The adjustable bolt 40 is provided to contact with the member 38 at its lower end so that the latter will not be too greatly flexed and broken by the impact of member 43. It will also be noted that the tamper, after being released, will be quickly pulled downward by the tension of springs 46. This will produce a much quicker action of the tamper than if the same were allowed to drop only by gravity. After the block has been lifted and moved forward, as shown in Fig. 2, the same will be removed with the pallet and a new pallet placed in the core box and the operation repeated.

In Fig. 5, a modification is shown, in which, instead of a coiled extensile spring 35, a leaf spring comprising a plurality of layers is used. This spring e will be secured in an angle member extending across the frame at the bottom thereof and will

extend around the rod 15 in contact with the same and in its front end formed with a hook extending under the rod 19. More than one of such springs can be used if desired.

In Fig. 6 the mold box is shown equipped with a rear wall and an end wall to form a rock face. When this is done the member d is substituted for the plain face rear member a^4 . The member d is equipped with hinge lugs d^2 and an end plate d^1 is hinged thereto and forms the end of the mold box. The end member a^2 is at this time merely positioned farther outwardly, as shown, the members a^1 being provided with extra holes e to permit this and rod 19 also being sufficiently long to permit such positioning. The end plate d^1 can be swung outwardly after the mold box has been lowered, to free the end of the block and thus not mar the surface thereof. When the rock end member d^1 is used, of course, no end core is used.

From the above description it is seen that applicant has provided a greatly improved form of concrete molding machine and one which can operate rapidly and efficiently. The pulley 44 is usually operated eighty or more times a minute so that the tamping is done very rapidly. The machine is made from standard material and can quite readily be assembled, while the parts thereof can be made rugged and of ample strength. It will, of course, be understood that various changes may be made in the form, details and arrangement of the parts without departing from the scope of applicant's invention, which, generally stated, consists in the matter shown and described and set forth in the appended claims.

What is claimed is:

1. In a concrete molding machine, a frame, a mold box thereon movable as a unit to tamping and discharging position, means for moving said box to tamping and discharging position, a tamper and frame aligned with and adapted to move toward and from the mold box when in tamping position, an elevating member for engaging said frame to raise the same and said tamper and yielding means on said frame with which said elevating member engages.

2. The structure set forth in claim 1, said yielding means comprising a curved resilient bar free at one end and a stop member for limiting the yielding movement of the free end of said bar.

3. In a concrete molding machine, a mold box, a tamping device adapted to move toward and from the mold box, a guiding frame for said tamper comprising a pair of oppositely disposed standard channel members, and a supporting frame for said tamping device comprising a yoke formed

from a continuous flat bar, the sides of which are movable in said channel members.

4. A concrete mold machine having in combination, a frame comprising longitudinally extending side members, a pivot rod extending transversely thereof adjacent the rear end thereof, spaced bars pivoted on said rod and extending forwardly of said frame members, a mold box supported on said bars, said bars being arranged to swing about said pivot rod to move the mold box to tamping and discharging positions, upright members on said frame, and means for supporting and operating a tamping mechanism in line with said mold box when in tamping position.

5. The structure set forth in claim 4, and means for swinging said bars upwardly including a roller acting thereon, said bars and mold box being adapted to swing downwardly by gravity.

6. A concrete molding machine having in combination, a frame comprising spaced longitudinal side members, a swinging spaced box located at the front thereof, a downwardly swinging supporting means for said box extending beneath the same, and extending to and pivoted at the rear of said frame and rigid links extending from said pivot to the top of said mold box above said spaced longitudinal side members.

7. A concrete molding machine having in combination a frame comprising spaced side members, a bar extending therebetween at the rear portion thereof, a mold box disposed at the front of said frame, swinging supporting means for the mold box disposed beneath the same and extending rearwardly and upwardly and pivoted to said bar, and rigid links pivoted to said bar and extending forwardly above said spaced side members and pivoted adjacent the top of said mold box.

8. A concrete molding machine having in combination a frame comprising spaced side members, a bar extending transversely of said frame at the rear thereof, a mold box disposed at the front of said frame, supporting means for said box comprising a pair of bars disposed beneath the same and extending to the rear of the frame and then slightly upwardly, and being pivoted to said bar and extending a short distance above the same, and a pair of links pivoted to the said bar and extending forwardly and pivoted adjacent the upper sides of said mold box.

9. A concrete molding machine having in combination a frame a mold box secured to means pivoted to said frame a pallet adapted to be disposed in the mold box, means for swinging said mold box downwardly, and

means for simultaneously lifting said pallet.

10. The structure set forth in claim 9, said latter means comprising two pairs of links and crank arms for actuating the same.

11. The structure set forth in claim 7, and means for varying the position of said bar relatively to said frame.

12. A concrete molding machine having in combination a frame a mold box secured to members pivoted said frame and mounted for downwardly swinging movement, a pallet, means for swinging said mold box and members downwardly, means for simultaneously lifting said pallets, and means for simultaneously moving said pallet forward.

13. A concrete molding machine having in combination a frame comprising spaced side members, a mold box disposed at the front of said frame and mounted to swing downwardly, pivoted supporting means for said mold box, guideways on said means, a roller disposed in said guideways, lever arms on which said roller is mounted for moving the same, a shaft on which said lever arms are mounted, and means for varying the position of said shaft.

14. A concrete molding machine having in combination a frame comprising spaced side members, a bar extending across said frame at the rear portion thereof, a mold box disposed at the front of the frame and arranged for downwardly swinging movement, supporting bars for said box disposed beneath the same and extending rearwardly and pivoted to said bar, rigid links pivoted to said bar and to the top of said mold box, adjustable connections between the top of said box and the supporting bars for said box, and an adjustable lifting device for moving said box upwardly to normal position.

15. The structure set forth in claim 4, roller slots formed on one of said gears, a roller movable therein, a lever carrying said roller, and means for swinging said lever to raise said bars and mold box to tamping position.

16. A concrete molding machine having in combination a mold box comprising front and side sections, said sections being invertible and reversible, both together and as separate parts.

17. A concrete molding machine having in combination a frame, a mold box comprising front and end members, means whereby one of said end members may be positioned out of normal position, and a rear member having an end member hinged thereto and held in place by said first mentioned end member which is out of normal position.

In testimony whereof I affix my signature.

GODFREY W. PAPKE.