

May 13, 1924.

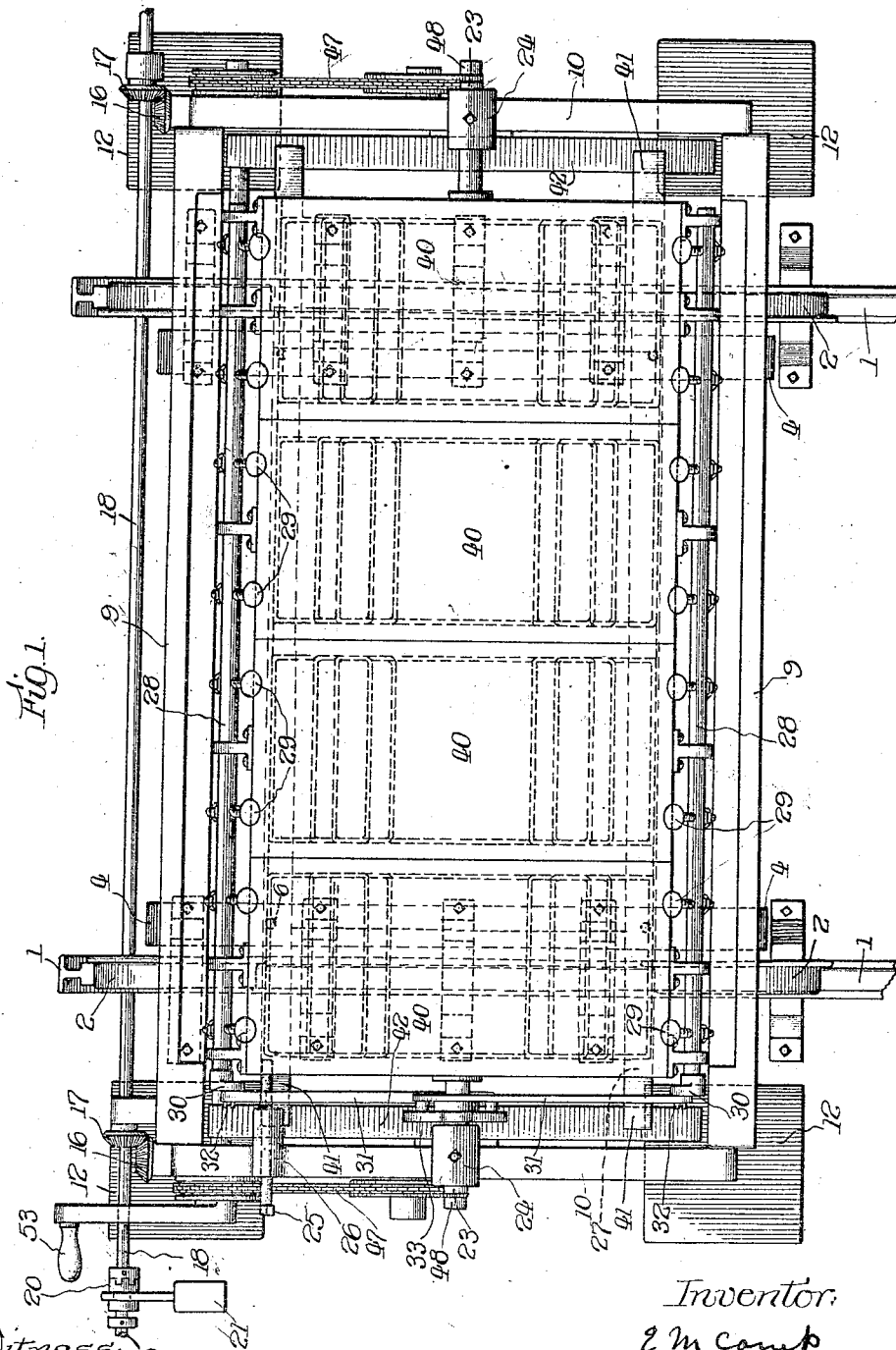
E. M. CAMP

1,493,732

CONCRETE BLOCK FORMING MACHINE

Filed July 25, 1921

4 Sheets-Sheet 1



Witness:
A. J. Sauer.

Inventor:
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By W. Williams

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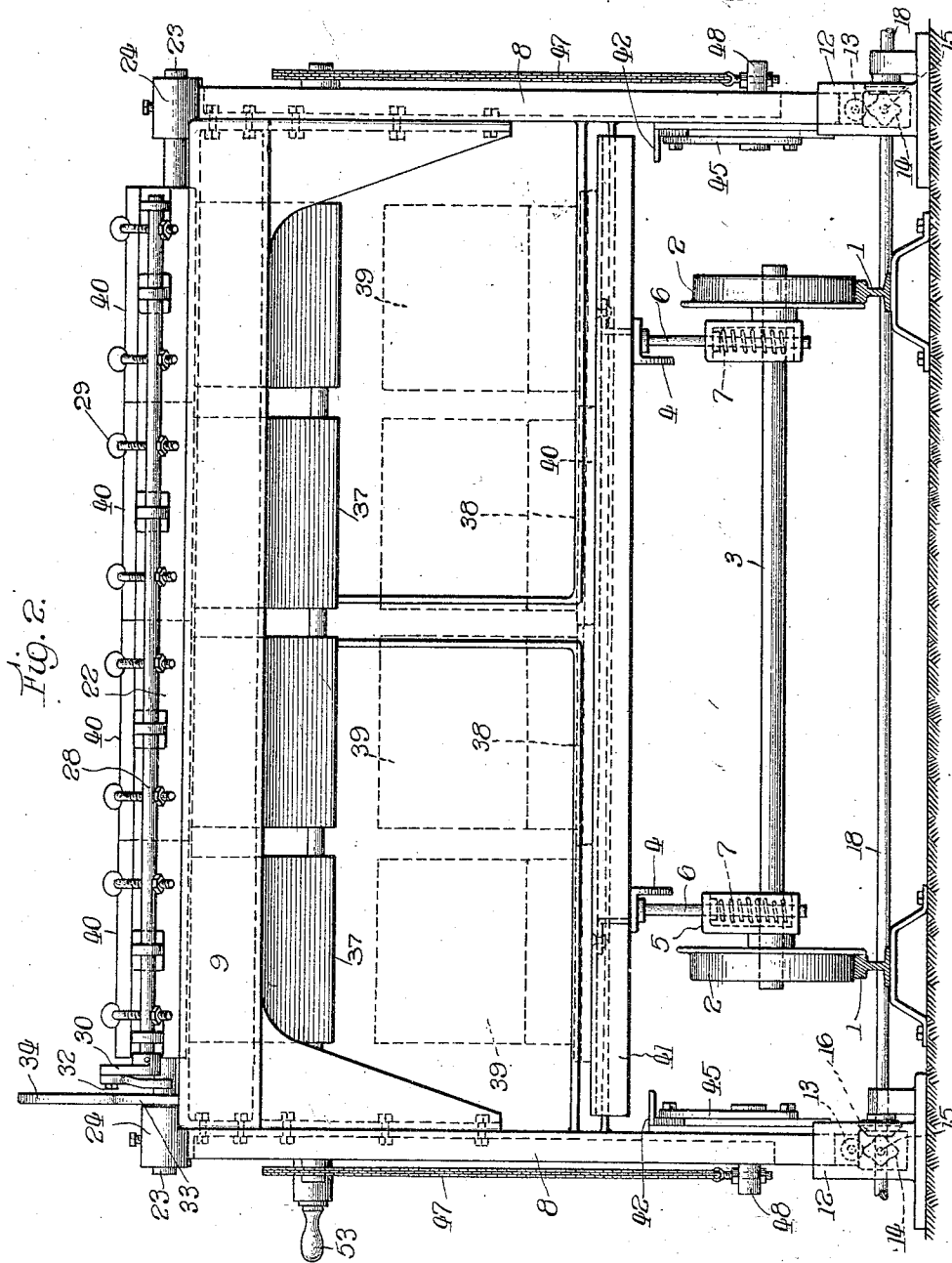
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4 Sheets-Sheet 2



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CONCRETE BLOCK FORMING MACHINE

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4 Sheets-Sheet 3

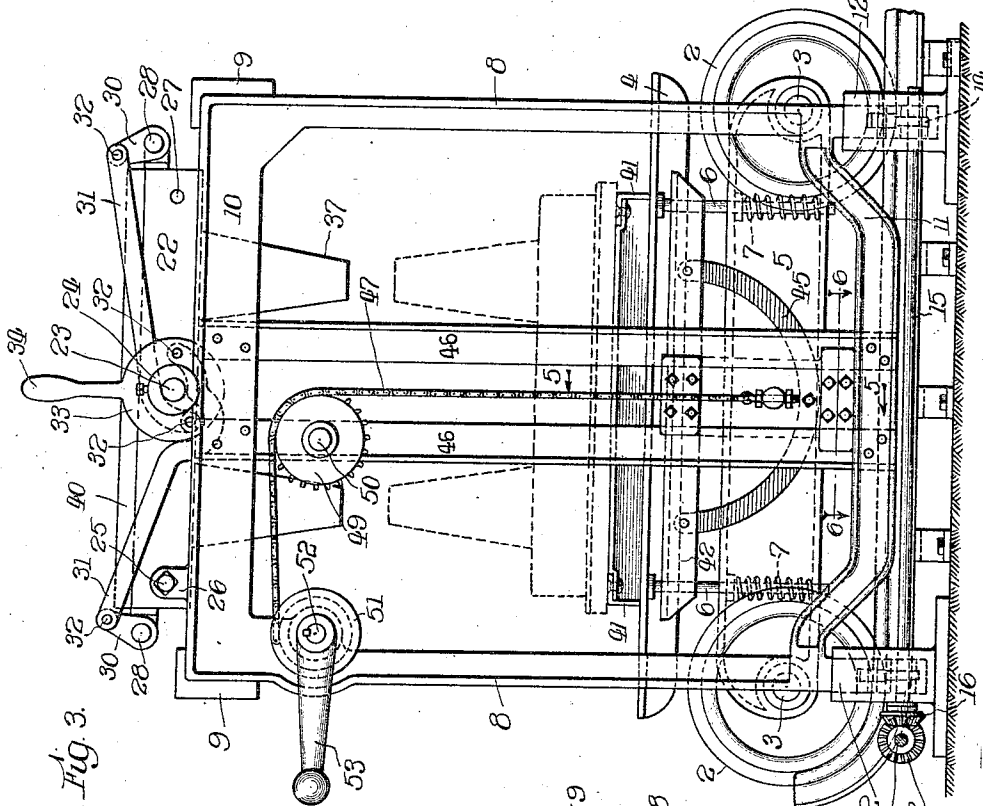


Fig. 3.

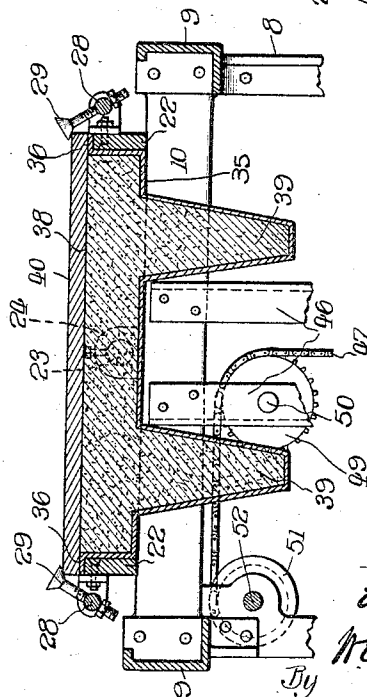


Fig. 4.

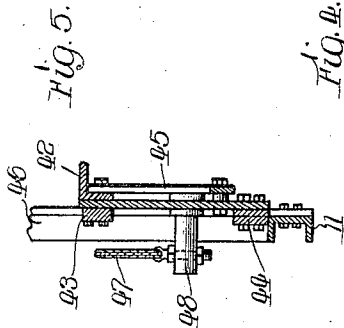


Fig. 5.

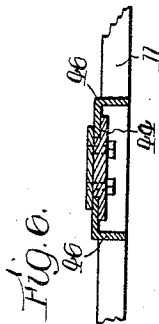


Fig. 6.

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4 Sheets-Sheet 4

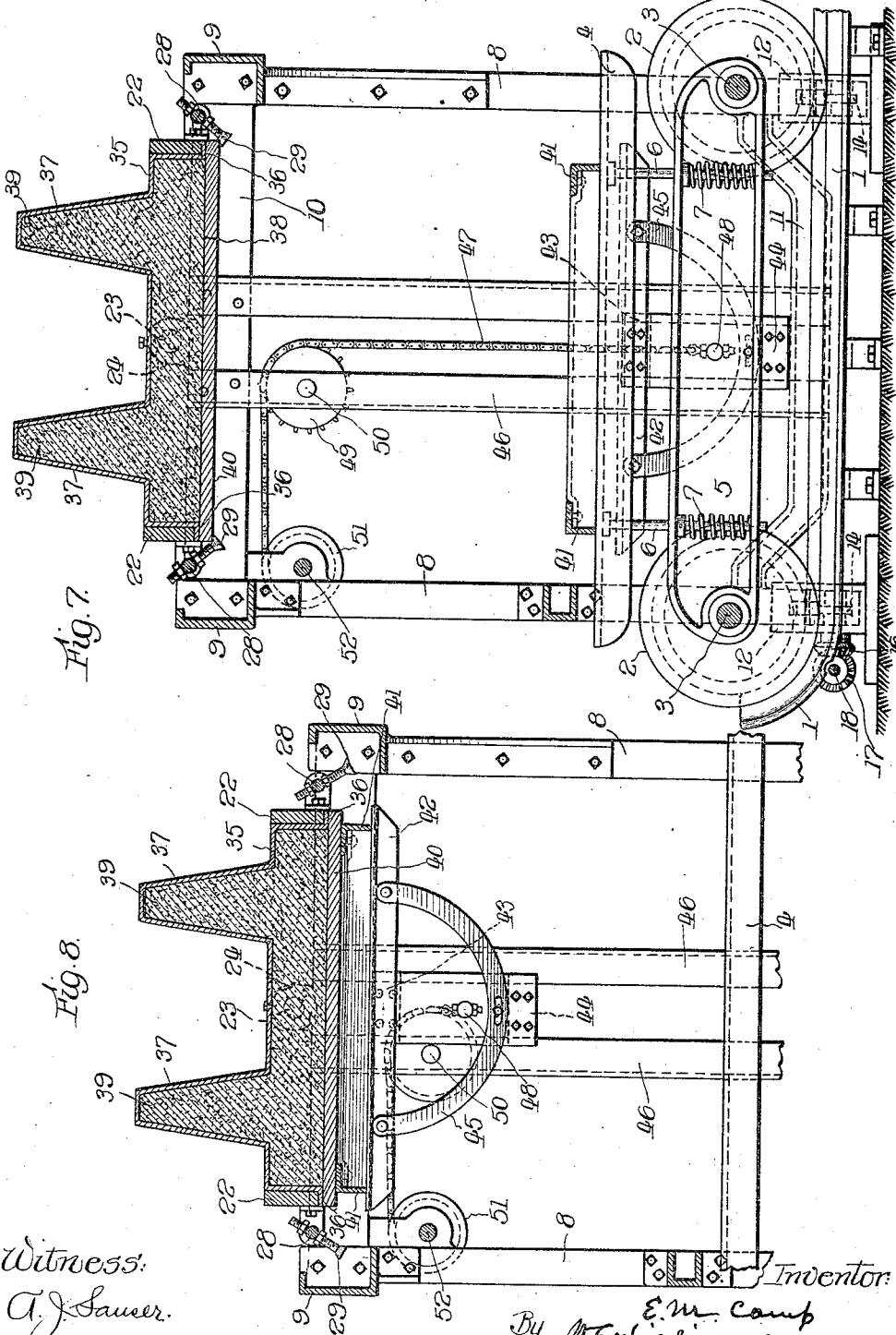


Fig. 7.

Fig. 8.

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UNITED STATES PATENT OFFICE.

ERVIN MOTT CAMP, OF CHICAGO, ILLINOIS, ASSIGNOR TO JOHN A. FERGUSON, OF DENVER, COLORADO.

CONCRETE-BLOCK-FORMING MACHINE.

Application filed July 25, 1921. Serial No. 487,287.

To all whom it may concern:

Be it known that I, ERVIN MOTT CAMP, a citizen of the United States, a resident of Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Concrete-Block-Forming Machines, of which the following is a specification.

My invention relates to machines that are used for forming concrete building blocks by compacting the material into special shaped molds when the material is in a plastic state and then removing the molded blocks to be cured.

The object of the invention is to provide a highly efficient machine for making a peculiarly desirable shaped block and for so treating the material in the molds of the machine that it will result in an exceptionally desirable block as will be understood from the details of the specification.

The invention is set forth in the claims.

Reference will be had to the accompanying drawings in which Figure 1 is a plan view of the machine.

Figure 2 is a side elevation of the machine.

Figure 3 is an end elevation.

Figure 4 is a transverse end sectional elevation of a part of the machine.

Figure 5 is an end sectional detail of a part of the mechanism of the machine on line 5—5 of Figure 3.

Figure 6 is a sectional detail showing the guideways to the block platen, on line 6—6 of Figure 3.

Figure 7 is a transverse sectional view showing the machine in a position preparatory to discharging the blocks from the molds.

Figure 8 is a view similar to Figure 7 showing another stage of the work.

In general terms my machine provides a series of molds mounted in suitable supporting frame work adapted to hold the molds in upright position to be filled with the concrete material from the top and then the molds are jarred to settle the material and then carrying boards or cover plates are placed over the molds and the molds then revolve, inverting the material in the molds on to the carrying boards. The vibration of the molds and product is again effected and then the material is withdrawn down-

ward out of the molds resting on the carrier boards and meantime these boards are supported on a movable table or frame and the table lowered with its cargo of carrying boards and molded blocks on to a truck or carrier by means of which the product is removed for curing and drying and the operation is again repeated for another set of blocks.

In the drawing 1 indicates the rails of an ordinary railroad track of light pattern suitable for the purposes of this machine. However, any other suitable carrier or means of transport may be employed than the devices here shown. 2 indicates the truck wheels and 3 the wheel axles and 4 the supporting beams of the truck. 5 indicates the truck side frame. While 4 indicates two rails only these rails amount to what may be termed the floor or carrying body of a flat car.

6 indicates the supporting rods for the rails 4 and these rods are mounted on springs 7 mounted in the truck frame, the purpose being to receive the load of plastic blocks with an elastic cushion effect without danger to deformation of the blocks.

8 indicates the corner posts of the main frame and 9 indicates the longitudinal beams of the frame, 10 indicates the cross body members and 11 the lower cross member. This frame may be made in any suitable manner differing from the construction here shown, it being necessary to have as it were a unitary frame body. This frame body is mounted into four socket posts 12 and these posts 12 are adapted to hold the feet of the corner posts 8 in vertical sliding arrangement and on the bottom of these posts 8 there are small rollers 13 shown in dotted lines and the weight of the posts is carried on the rollers. These small rollers ride on some rotating cam blocks 14 mounted on cross shafts 15 that are connected by bevel gears 16 that are engaged by another set of bevel gears 17 on a shaft 18 driven in any suitable manner intermittently as desired, for the purpose of vibrating, jarring or jolting the machine as will be understood from further description.

This shaft 18 may be driven from either end from any suitable source of power.

In Figure 1 I have shown the driving as being taken off from the shaft 19, being

the source of power to be intermittently engaged by a dental clutch 20 with the shaft 18 through the medium of the lever 21 or any other suitable engaging mechanism.

5 Any suitable vibrating or jolting mechanism may be used instead of what I have shown.

Thus by the arrangement of the cam blocks 14 revolving in connection with the rollers 13 the whole frame is vibrated vertically by little short, sharp shocks when-
10 ever the operator desires to do so.

A frame work 22 which is substantially a square frame open both at the top and the bottom is mounted on shafts or trunnions 23 and it carries the series of molds
15 desired for any shape of concrete block desired to be made.

The shafts or trunnions 23 which carry the frame 22 are journaled at 24 to the
20 cross members 10 of the frame and this frame is held in the positions desired by means of a locking bolt 25 held in a keeper 26 also on the frame piece 10. The bolt 25 engages the frame 22 by means of some
25 holes 27 in the end of the frame, one being provided on each side to register the position of the frame in upright or inverted position as desired.

Mounted along the side members of the
30 frame 22 there are some bell crank shafts 28 which carry a series of clamping fingers 29 and the shafts 28 are operated to move the fingers 29 through the medium of some levers 30 hinged to links 31 by the pins
35 32 and these links 31 are connected by hinge pins 32 to a hand lever block 33 having the hand lever 34 and this block is mounted on the shafts 23 and moves at all times with the frame 22 as the latter is re-
40 volved as desired.

By movement of the hand lever 34 the links 31 may be made to rotate the shafts 28 and thus move the clamping fingers 29 as
45 desired. In the position of these parts as indicated in all figures save that of Figure 8 the hand lever 34 and its blocks 33 is such that the position of the shafts 28 are locked to hold the fingers 29 in a set position and
50 this locking is brought about by the links 31 being, as it were, over the dead center as relates to the shafts 23, so that the parts will not move during the vibrating operation as previously described.

The concrete molds are here shown of peculiar form and indicated by 35 and are
55 held in the frame 22 by reason of the marginal flanges 36 resting upon the top edges of the side rails of the frame 22. These molds 35 have projections 37 adapted to make a block having a broad flat face 38
60 with two deep projections 39, but any other suitable form of block may be used with this machine, depending on the shape of the molds used therewith.

65 The cover or carrying boards 40 are

shown applied to the tops of the molds and the molds are shown as being filled with the concrete material and the carrying boards 40 applied thereon. However, when the
70 molds are being filled the boards 40 are removed. In the operation of filling the molds the operator sets in motion the vibrating mechanism and jars the whole machine and thus settles the material down
75 into the mold, driving out the surplus water and the surplus air and then he smooths off the top surface of the molds and applies, if he desires, a finishing surface of finishing material different from that of the main
80 body in the molds and then after the finishing material is applied and properly leveled down, carrying boards 40 are placed upon the top of the frame 22 and over the
85 top of the molds 35 and thereupon the fingers 29 are brought into locking contact with the boards 40 as shown by Figure 4 and then the bolt 25 is released from the frame and the frame 22 is revolved, invert-
90 ing the position from that shown in Figures 3 and 4, to the position shown in Figures 7 and 8, wherein the weight of the plastic mass in the molds is resting upon the carrier boards 40.

The machine as shown is intended to
95 mold several blocks at a time and is provided with several sets of molds as will be seen from Figure 1. In order to carry and handle the several sets of blocks economically I provide a carrier frame 41 that extends lengthwise of the machine a sufficient
100 length to accommodate all the blocks that the machine is intended to handle and this frame 41 rests on the rails 4 of the carrier or transport truck previously mentioned when it is desired to remove the plastic
105 blocks from the machine.

In order to bring the frame 41 in supporting connection to the carrier blocks 40 I provide some cross member frame pieces
110 42 at each end of the machine, riveted at 43 to a reciprocating cross head 44 and also connected with this cross head 44 by some brace pieces 45. The cross head 44 is mounted in sliding arrangement with some
115 vertical frame member pieces 46 so that the frame members 42 may be raised and lowered as desired through the medium of some chains 47 connected at 48 to the blocks 44 and trained over some sprocket wheels 49
120 mounted on studs 50 to one of the frame pieces 46. The chains 47 are fixed to and wound upon windlass blocks 51 mounted on a windlass shaft 52 under the control of a windlass crank 53. Thus the operator by
125 use of the crank 53 brings the frame 41 from the position shown in Figure 7 to that shown in Figure 8 in contact with the carrier boards 40 and in this position the machine is again vibrated, settling as it were the main mass of the plastic blocks on to
130

the finishing or facing material on the face of the block and at the same time driving out the entrained air and surplus water and also loosening the material from the molds so that as the frame rails 42 are released by the windlass dropping down the frame 41 the carrier boards 40 with the concrete blocks riding thereon go down and out of the molds with a downward movement as the operator unwinds the windlass, letting out the chain 47, the fingers 29 having been freed from the boards 40 before the downward movement is undertaken.

The operator slowly unwinds the windlass and if need be slightly jars the machine to loosen the material from the molds and lets the frame 41 with its cargo of plastic blocks come gently to rest on the carrier or transport truck as is indicated by the dotted position of the blocks shown in Figure 2. The spring 7 of the said truck allows an easy landing on the truck without danger of impact shock damaging the shape of the plastic blocks carried on the boards 40. The frame pieces 42 are continued to be lowered until clear of the frame 41, allowing the entire load of the blocks to be supported on the truck or carrier and rolled out from under the machine to where they are deposited for curing.

On a resumption of operations another frame 41 is delivered in position by the truck ready for the operation to be repeated for a new set of blocks. The whole frame 22 being reversed to receive a new charge of plastic material together with a fresh lot of supporting boards 40 provided the latter are needed from the set of the material that is carried thereon.

To accommodate different thicknesses of carrier boards 40 I provide some clamping fingers 29 with an adjustable connection into the shafts 28 as is indicated by the screw threaded portions and nuts shown on the shanks of the said fingers 29.

The carrier truck I have described for carrying away the product of the machine I term as a carrier and while I prefer to use this truck as a carrying means for taking the product out from the machine I may use any suitable carrier adapted to coact with the machine as described for the purpose of taking the molded product out from the machine.

The method of vibrating the material during the filling of the molds and then putting on the facing material and reversing the position of the molds with a secondary vibration in an inverted position insures a homogeneous state of union of all the material used in the blocks and insures a final better product than has heretofore been obtained in machines of this class.

The mechanism I have shown for vibrat-

ing or jolting the molds and their contents may be varied to any of the mechanical equivalents of vibrating or jolting devices but I prefer to use those shown. For illustration, instead of the mechanically cam operated jolting devices I may use the compressed air or fluid jolting systems used on various different molding machines. The purpose being to provide a means whereby the operator may mechanically vibrate or jolt the product for the purposes I have described.

What I claim is:—

1. In a device of the class described, a mold carrying frame mounted in the main frame of the machine in a manner to be revolved in different positions thereon, a reciprocating frame adapted to be moved to and from the mold carrying frame and receive from the latter the formed blocks molded in the mold carrying frame, and means for vibrating the main carrying frame and the parts carried thereby.

2. In a device of the class described, a mold carrying frame adapted to be revolved in different positions and means for vibrating the same in a plurality of positions; in combination with a movable frame adapted to receive the molded material as discharged from the vibrating frame and a movable carrier adapted to receive the movable frame and carry out from the machine, the product molded by the mold carrying form and its members.

3. In a device of the class described, frame work adapted to carry concrete block forming devices, with means for vibrating the frame work; in combination with a carrier for receiving the product of the concrete block forming devices and located underneath the forming devices for the blocks and adapted to receive the same from the machine.

4. In a device of the class described, concrete block mold carrying devices adapted to carry the molds in a plurality of positions, a frame work supporting the said mold carrying devices and means for vibrating the said frame work; in combination with a carrier adapted to receive the product of the concrete molds and remove it from the machine and located underneath the mold carrying devices.

5. In a device of the class described, a series of vibrating devices upon which the machine is supported, a series of plastic material forms carried by the machine and adapted to be vibrated by the said vibrating devices, a movable carriage located underneath the plastic material forms and adapted to receive the formed material from the molding forms.

6. In a device of the class described, a frame for the machine seated upon vibrating devices, a mold carrying frame adapted

to be revolved in the function of molding the plastic parts, vertically reciprocating carrying devices adapted to receive the molded material from the molds and transfer it a horizontally carrying device.

5 7. In a device of the class described, a frame work adapted to carry mold forms and provided with means for revolving the forms, together with means for vibrating the forms; in combination with vertically 10 movable carrying devices adapted to receive and lower from the molds the material formed therein.

8. In a device of the class described, a 15 frame work adapted to carry molds for plastic forms and said molds mounted in the said frame in a manner to be revolved therein, means for vibrating the molds and means for receiving the material discharged 20 from the molds and said means having elastic seats for dissipating the impact on the discharge of the material.

9. In a device of the class described, a 25 mold carrying frame adapted to be revolved in the filling and discharging of the molds, vertical reciprocating devices for receiving the material molded and lowering it to a horizontal carrier; in combination with a horizontal carrier provided with spring 30 mounted supporting devices adapted to re-

ceive the material from the said vertical carrier.

10. In a device for molding building blocks from a wet cementitious mixture having a detachably covered mold form, means 35 for jolting said mold form and its contents for consolidating the material in the mold form and means for removing the molded material and the detachable cover for the form from the mold form and means for 40 removing the molded material away from the machine.

11. In a device of the class described, a mold form and a detachable cover therefor, means for jolting the mold form and its 45 contents for consolidating the material in the mold and means for jolting the said form and its contents in a bodily reversed position and means for removing the material and detachable cover from the mold 50 form and means for removing the same from the machine.

Signed at Chicago, in the county of Cook and State of Illinois, this 21st day of June, 1921.

ERVIN MOTT CAMP.

Witnesses:

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F. M. ZOBEL.