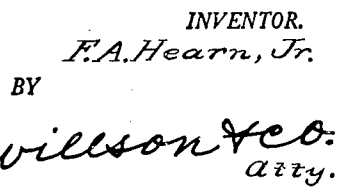


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5 Sheets-Sheet 1



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March 15, 1949.

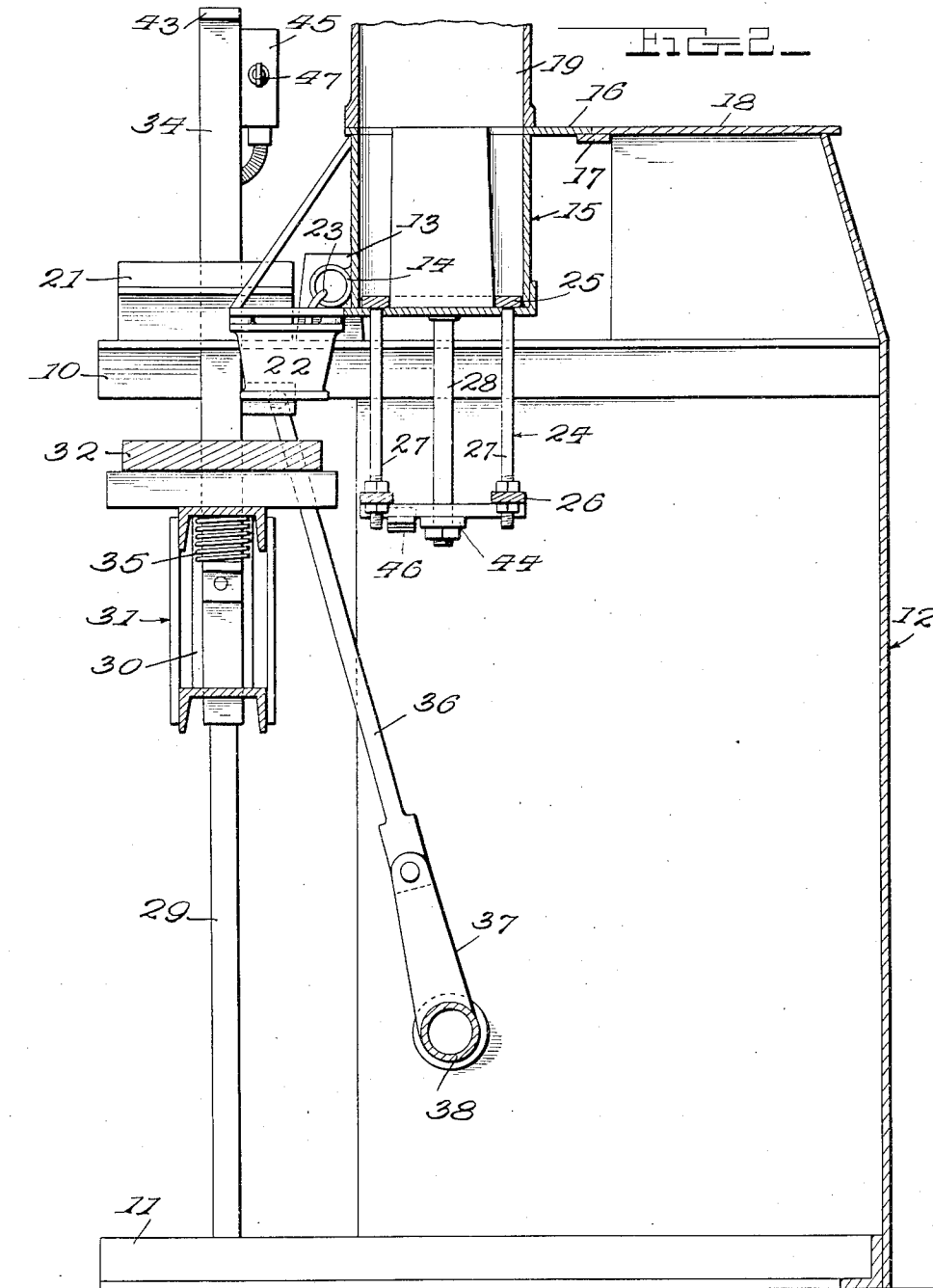
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BLOCK STRIPPING AND HEIGHT CONTROL MEANS

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5 Sheets-Sheet 2



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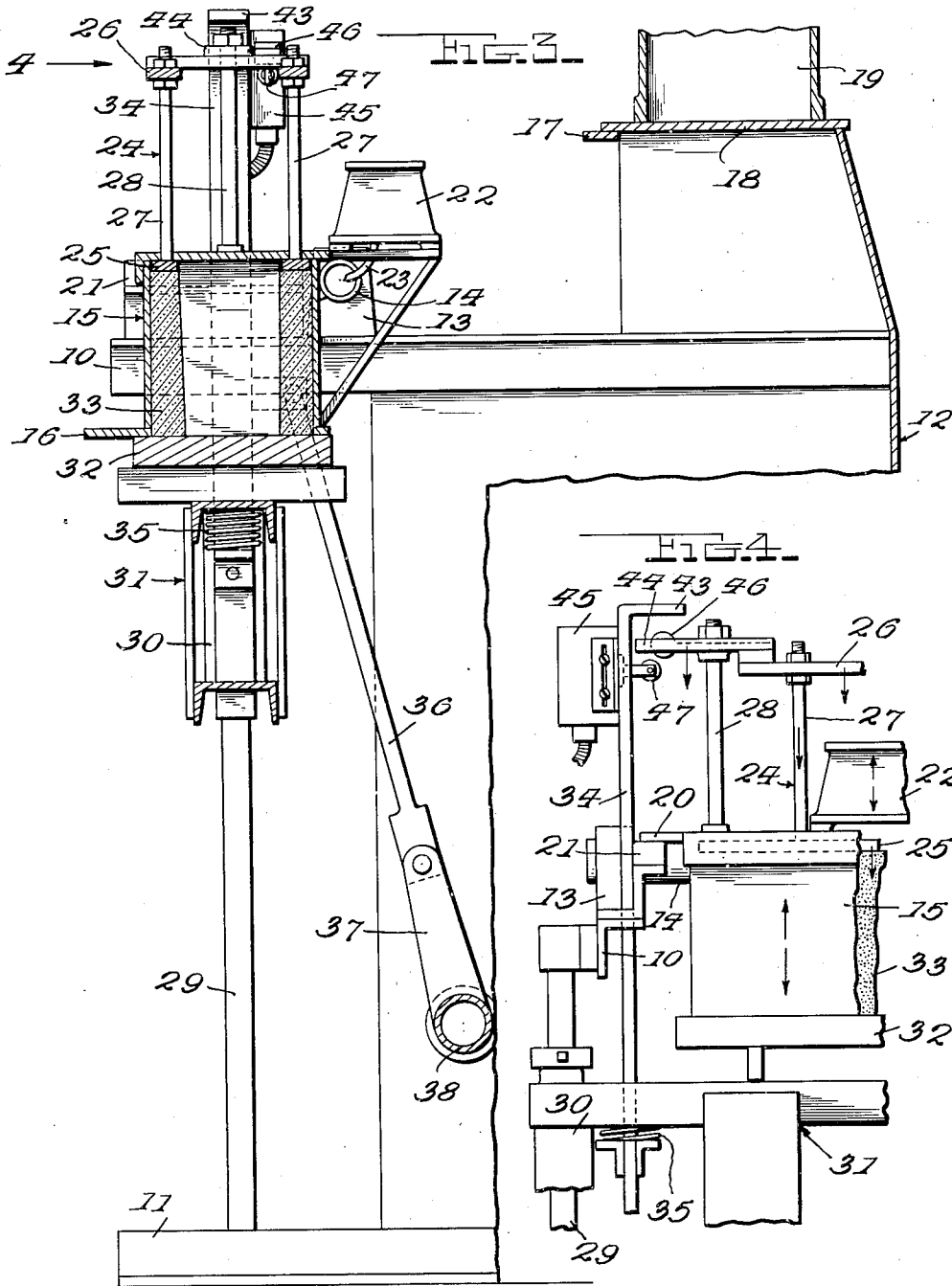
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BLOCK STRIPPING AND HEIGHT CONTROL MEANS

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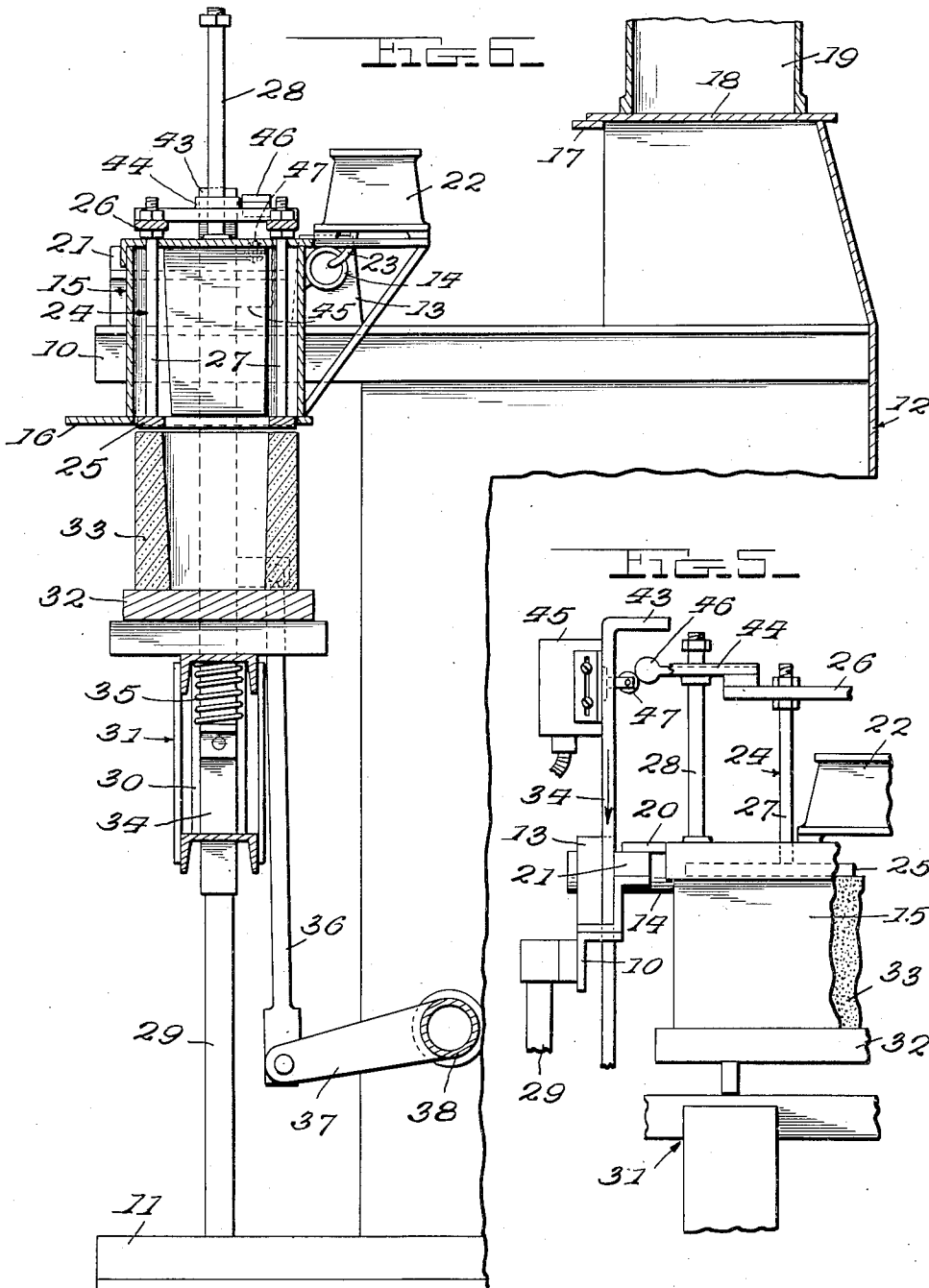
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BLOCK STRIPPING AND HEIGHT CONTROL MEANS

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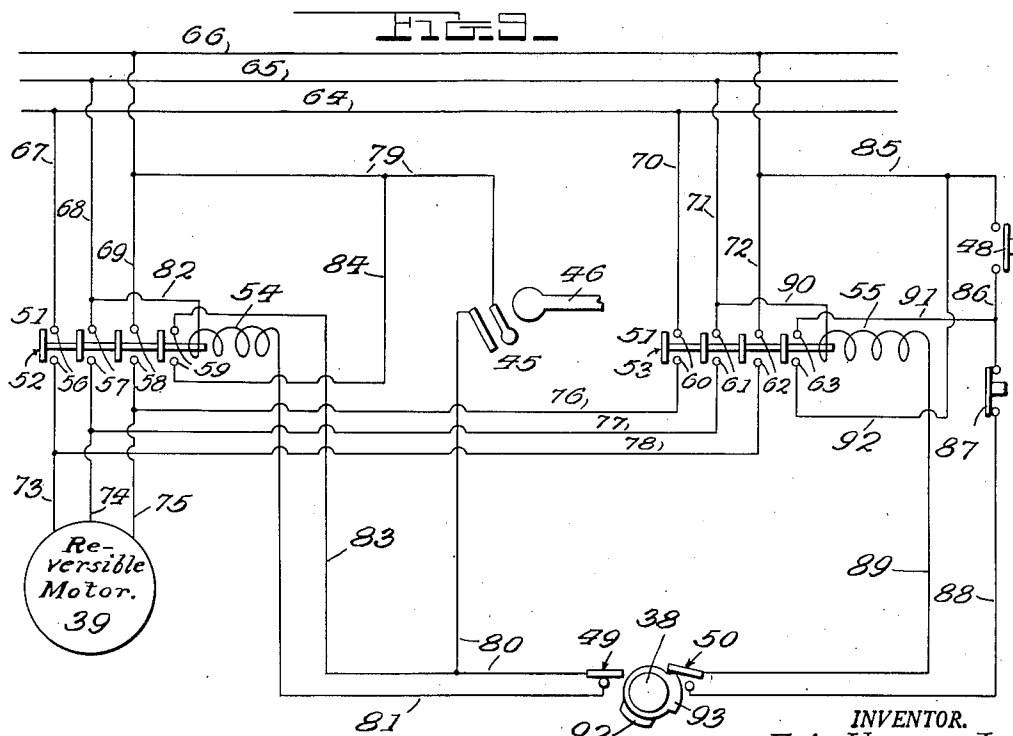
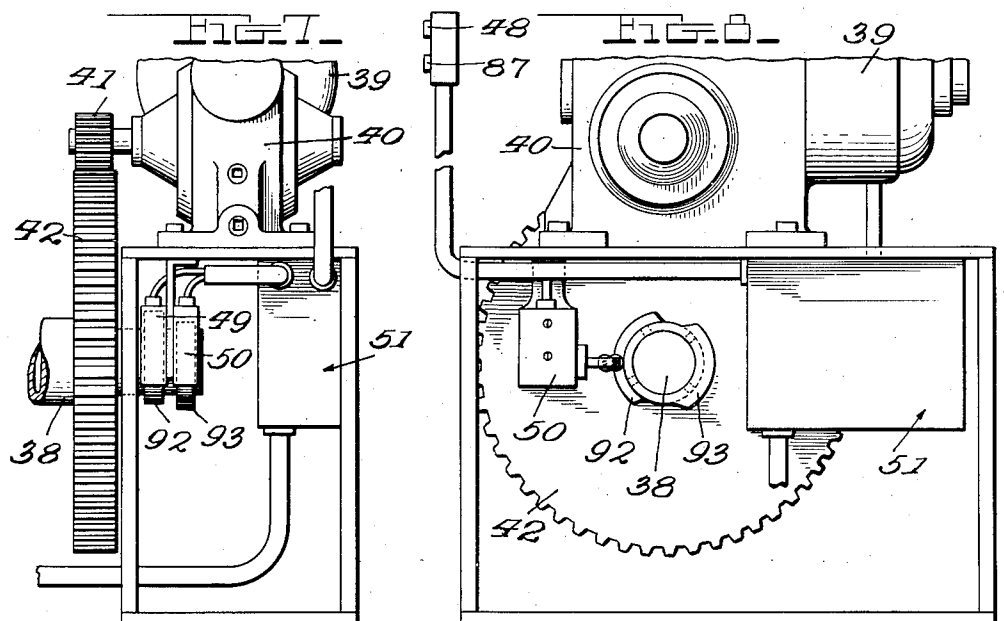
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BLOCK STRIPPING AND HEIGHT CONTROL MEANS

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5 Sheets-Sheet 5



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UNITED STATES PATENT OFFICE

2,464,641

BLOCK STRIPPING AND HEIGHT CONTROL MEANS

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6 Claims. (Cl. 25—120)

1

The invention relates to improvements in block moulding machines, used for moulding concrete blocks and cinder blocks, and it aims to provide an improved machine having electrically operated stripping means which includes novel provision whereby the stripper, which ejects any moulded block from the matrix, is operated only after said block has been compacted to a predetermined height, by vibration.

Another object is to provide a new and improved stripper-operating and height control means of simple, efficient and durable nature which may be embodied in a block machine without the necessity of making extensive changes in the latter. In the drawings,

Figure 1 is a perspective view showing the improved machine, the various parts being in the positions which they assume when the matrix is ready for filling.

Fig. 2 is a vertical sectional view on line 2—2 of Fig. 1 but showing the hopper moved forwardly over the matrix preparatory to filling the latter.

Fig. 3 is a view similar to Fig. 1 but showing the matrix and a moulded block therein inverted upon a pallet in readiness for block ejection or stripping.

Fig. 4 is a fragmentary front elevation as indicated by the arrow 4 of Fig. 3, illustrating the relation of elements when the vibration is started to compact the block to predetermined height.

Fig. 5 is a view similar to Fig. 4 but illustrating the manner in which the motor-starting switch is closed when the stripper initially descends to a predetermined extent simultaneously with compaction of the block.

Fig. 6 is a view similar to Figs. 2 and 3, the stripping mechanism, however, being shown in its block-ejected position and the block in readiness for removal from the pallet.

Fig. 7 is a front elevation illustrating the driving means for the stripper-operating shaft, and the limit switches which are operated by cams on said shaft.

Fig. 8 is an end elevation of the parts shown in Fig. 7.

Fig. 9 is a wiring diagram.

For illustrative purposes, the improvements are disclosed in a block machine of known type modified to include said improvements, but it is to be understood that the invention is not restricted to the exact environment disclosed.

In the construction illustrated in the drawings, upper and lower angle bars 10 and 11 project forwardly from a casing-like body 12,

2

and said upper angle bars 10 carry bearings 13 in which trunnions 14 of the matrix 15 are pivotally mounted, to permit inversion of said matrix from the filling position of Figs. 1 and 2, to the block-discharge position of Figs. 3 and 6. When the matrix 15 is in the position of Figs. 1 and 2, a flange 16 thereof rests upon a ledge 17 at the front edge of a horizontal platform 18 supported by the body 12. Suitably mounted for movement from the platform 18 onto the matrix 15 and vice versa, is a hopper 19 for guiding the block-forming material into said matrix when the hopper 19 is in the position of Fig. 2, and for striking off excess material when said hopper is pushed back to the position of Figs. 1 and 6. When the matrix 15 occupies the position shown in Figs. 3 and 6, suitable projections on said matrix, one of which is shown at 20 in Figs. 4 and 5, lie upon suitable supports 21 which are secured to the upper angle bars 10.

Suitably secured to the matrix 15, is an electrically operated vibrator 22, the wiring 23 of which may well extend through one of the trunnions 14 a suitable control switch being provided for this wiring in order that the vibrator 22 may be brought into play during matrix filling to compact the material, and later as hereinafter described.

The matrix 15 carries a stripper 24, said stripper comprising an inner frame 25 within the matrix 15, another frame 26 at the exterior of said matrix, and rods 27 connecting said frames 25 and 26. The inner ends of the rods 27 may be slidably engaged with the matrix in any suitable way to guide the inner end portion of the stripper 24, and the outer end portion of said stripper is slidably engaged with guide rods 28 suitably secured to the matrix.

Two vertical track rods 29 are secured to the front ends of the angle bars 10 and 11, and guide sleeves 30 of a pallet-supporting carriage 31, are slidable on said rods, said carriage 31 being adapted to support a pallet 32 in position to receive a block 33 formed in the matrix 15, when this matrix is moved to the block-ejecting position of Figs. 3 and 4. It will be observed from these views that when the matrix 15 is in this position, the stripper 24 rests upon the block 33. With the block so related with the matrix and stripper, the vibrator 22 is again actuated to further compact said block, as indicated by the arrows in Fig. 4, and as said block is thus settled, the stripper 24 descends without being otherwise moved at that time. This descent of the stripper is relied upon to start operation of the stripper-

actuating means hereinafter described, when the block 33 has been compacted to a predetermined height.

Two stripper-actuating bars 34 are slidably mounted on the frame of the machine in any suitable way, and at their lower portions are slidably engaged with the pallet-supporting carriage 31, with which carriage said bars are yieldably connected by means of the springs 35. Connecting rods 36 are pivotally connected at their upper ends with the bars 34 and are pivoted at their lower ends to crank arms 37 on a rock shaft 38 rotatably supported by the lower portion of the machine body 12. Heretofore, the shaft 38 was provided with a hand lever for turning it in one direction to pull the bars 34 downwardly, and in the other direction to again raise said bars 34, but I substitute an electric motor and reduction gearing for said hand lever. The motor is denoted at 39, directly coupled to a casing 40 containing reduction gearing for driving a pinion 41, and this pinion meshes with a gear 42 secured upon the shaft 38. The motor 39 is controlled by means hereinafter described and said motor is reversible to turn the shaft 38 in either direction. When this shaft is rotated in one direction, the arms 37 and connecting rods 36 pull the bars 34 downwardly to actuate the stripper as seen in Fig. 6, and when said shaft is rotated in the other direction, said arms and connecting rods again raise the bars 34 to the normal position shown in Figs. 1, 2 and 3. The upper ends of these bars 34 are provided with lateral lugs 43 to engage projecting fingers 44 on the outer stripper frame 26 as said bars 34 descend.

One of the stripper-actuating bars 34 carries a starting switch 45 for the motor 39, and the outer frame 26 of the stripper 24 is provided with an operating arm 46 to engage the roller 47 of said switch 45 when said stripper has been caused to initially descend to a predetermined extent under the influence of the vibrator 22, while operating the latter to compact the block 33 to predetermined height, while said block is supported on the pallet 32. Compare Fig. 4 (matrix and block upon pallet and vibrator 22 operating) with Fig. 5, and it will be seen that just as soon as the block 33 has been compacted to the predetermined height, the arm 43 will close the switch 45, thus starting the motor 39 in a direction to pull the stripper-actuating bars 34 downwardly, thus actuating the entire stripper 24 to downwardly eject the block 33 from the matrix 15 as seen in Fig. 6. When the block has been removed, a hand switch 48 is operated and due to construction hereinafter described, this switch reverses the direction of rotation of the motor 39 and causes return of the bars 34 to their normal positions. In addition to this switch 48 and the switch 45, the motor-controlling means also includes two limit switches 49 and 50. Switch 49 limits the rotation of the motor 39 when effecting block ejection, and the switch 50 limits the motor rotation when restoring the stripper-actuating bars 34 to their normal raised positions. The switches 45, 48, 49 and 50 are cooperable with a motor reversing switch 51 in controlling the motor 39. This reversing switch is preferably of the "across-the-line" type. In Fig. 9, the shiftable switch members 52 and 53 are both to be considered as parts of the switch 51. At 54, an actuating coil has been shown for shifting the member 52, and another coil 55 has been illustrated for shifting the member 53. Member 52 is operable to bridge between pairs of contacts 56, 57,

58 and 59 and switch member 53 is cooperable in the same way with pairs of contacts, 60, 61, 62 and 63. Three line wires 64, 65 and 66 are shown. A wire 67 connects the line wire 64 with one of the contacts 56, a wire 68 connects the return wire 65 with one of the contacts 57, and a wire 69 connects the line wire 66 with one of the contacts 58. A wire 70 connects wire 64 with one of the contacts 60, a wire 71 connects wire 65 with one of the contacts 61, and a wire 72 connects wire 66 with one of the contacts 62. Three motor leads 73, 74 and 75 are connected with the others of the contacts 56, 57 and 58 respectively, and three motor leads 76, 77 and 78 are connected with the others of the contacts 60, 61 and 62, lead 76 being connected with lead 75, lead 77 being connected with lead 74, and lead 78 being connected with lead 73.

A wire 79 branches from the wire 69 and extends to the switch 45, and another wire 80 extends from said switch 45 to the limit switch 49, which switch is of a self-closing type. A wire 81 extends from the switch 49 to the coil 54, and a wire 82 extends from said coil to the wire 58. A wire 83 connects the wire 80 with one of the pair of contacts 59, and a wire 84 connects the other of these contacts with the wire 79.

A wire 85 extends from the wire 72 to the switch 48, another wire 86 extends from this switch to a normally closed safety cut-out switch 87, and a wire 88 extends from the latter switch to the limit switch 50, the latter being of a self-closing type. From this limit switch 50, a wire 89 extends to the coil 55, and from this coil a wire 90 extends to the wire 71. A wire 91 connects wire 85 with one of the pair of contacts 63, and the wire 92 connects the other of these contacts with the wire 85.

A suitable cam 92 is provided on the shaft 38 for opening the limit switch 49 when the stripper-actuating bars 34 have been pulled downwardly to the required extent to cause block ejection; and a similar cam 93 is provided on said shaft for opening the limit switch 50 when said bars 34 have been restored to their normal upper positions. These cams are preferably adjustably mounted upon the shaft by means of appropriate set screws.

Operation

The matrix 15 is filled while in the position shown in Figs. 1 and 2, by discharging the mix into it from the hopper 19, while vibrating the matrix by means of the vibrator 22, the stripper 24 being then in the position shown in these views. The hopper 19 is then forced back onto the platform 18, striking off what is then the upper surface of the block, and the matrix 15 is inverted onto the pallet 32, by means of a suitable hand lever L attached to one of the trunnions 14. Then, with the block 33 resting upon the pallet, as shown in Figs. 3 and 4, the vibrator 22 is operated again, resulting in initial descent of the stripper 24 and further compaction of the block 33. When this block has been compacted to the desired height, the arm 46 strikes the roller 47 and closes the motor-starting switch 45. At this time, the limit switch 49 is closed. Referring to Fig. 9, current then flows from the line wire 66 through the wires 69 and 79, and the closed switch 45, to the wire 80, along this wire and through the closed limit switch 49 to the wire 81, along this wire 81 to the coil 54, through this coil to wire 82 and through this wire 82 and the wire 68 to the wire 65. It will thus be seen that

5

closing of the switch 45 energizes the actuating coil 54 of the shiftable switch member 52, with the result that this member then bridges between the pairs of contacts 56, 57 and 58 to supply current to the motor 39, thus driving the latter in the proper direction to pull the stripper-actuating bars 34 downwardly to eject the completed block as seen in Fig. 6. The coil-effected movement of the switch member 52 also causes this member to bridge between the pair of contacts 59, thereby establishing a maintaining circuit for the coil 54, including the limit switch 49. Thus, as soon as roller 47 moves downwardly away from arm 46, upon descent of the bars 34, even though switch 45 will again open, coil 54 will remain energized and the motor will continue to rotate until cam 92 opens switch 49. When this occurs, the switch member 52 returns to the position shown in Fig. 9, stopping the motor with the various parts in the positions shown in Fig. 6. The completed block 32 and its pallet are now removed and the manual switch 48 is closed. This establishes a circuit for the actuating coil 55 of the switch member 53, with the result that this switch member is shifted and the motor 39 operated in the reverse direction to again restore the bars 34 and pallet carriage 31 to their raised positions. As soon as the shaft 38 starts, in effecting this movement of parts, the limit switch 50 closes and thus maintains the circuit of the coil 55 until said limit switch 50 is again opened, which occurs when the bars 33 have been restored to their maximum raised positions. The matrix and stripper may then be returned to the position of Figs. 1 and 2, for recharging of said matrix.

From the foregoing, taken in connection with the accompanying drawings, it will be seen that novel and advantageous provision has been made for carrying out the objects of the invention, attention, however, being invited to the possibility of making numerous variations within the scope of the invention as claimed.

Switch 45 is preferably mounted for vertical adjustment, to change the height to which each moulded block will be compacted prior to stripper operation, if desired.

I claim:

1. In a block mould, a matrix for moulding a block, a stripper for downwardly ejecting a moulded block from said matrix, said stripper resting on said block when the latter is in position for ejection from the matrix, vibrating means operable to cause initial descent of said stripper to compact the block to predetermined height before ejection, and means for relatively moving said stripper and matrix to eject the block, said means including an operating motor, and a starting switch for said motor actuated by predetermined initial descent of said stripper.

2. In a block moulding machine including a matrix for moulding a block, a stripper for downwardly ejecting a moulded block from said matrix, said stripper resting on said block when the latter is in position for ejection, a stripper actuator cooperable with said stripper for operating the same, and means mounting said stripper actuator for movement from a normal idle position to a block-ejected position; a reversible electric motor and operating connections from said motor to said stripper actuator for operating the latter to cause block ejection when

6

said motor is rotated in one direction and for again restoring said stripper actuator to said normal idle position when said motor is rotated in the reverse direction, vibrating means operable to cause initial descent of said stripper to compact the block within said matrix to a predetermined height before actuation of said stripper to eject said block, and controlling means for said motor including a starting switch operable by predetermined initial descent of said stripper for causing rotation of said motor in said one direction to eject the block from the matrix, said motor-controlling means also including a switch for causing reversing of said motor after the ejected block has been removed, said motor-controlling means also including limit switches for limiting rotation of said motor in said directions.

3. In a block moulding machine including pallet-supporting means, a matrix for moulding a block, means mounting said matrix for inversion from a filling position to a block-ejecting position over said pallet-supporting means, a stripper carried by said matrix, said stripper resting on the moulded block in said matrix when the latter occupies said block-ejecting position, a vertically slidable stripper-actuating bar connected with said pallet-supporting means and having means for lowering said stripper for block ejection when said bar is slid downwardly, and means mounting said stripper-actuating bar for movement from a normal raised position to a lowered block-ejected position; a reversible electric motor and operating connections from said motor to said stripper-actuating bar for lowering said bar when said motor is rotated in one direction and for again raising said bar when said motor is rotated in the reverse direction, vibrating means operable to cause initial descent of said stripper and compaction of the moulded block to predetermined height while the matrix occupies said block-ejecting position, and controlling means for said motor including a starting switch mounted on said stripper-actuating bar for causing motor rotation in said one direction, and an operating member for said starting switch mounted on said stripper in position to close said starting switch upon predetermined initial descent of said stripper, thereby effecting block ejection, said motor-controlling means also including a switch for causing reversing of said motor when the ejected block has been removed, said motor-controlling means also including limit switches for limiting rotation of said motor in said directions.

4. A structure as specified in claim 3; said operating connections including a rock shaft driven by said motor, said rock shaft having operating cams for said limit switches.

5. A structure as specified in claim 1; together with means mounting said starting switch for vertical adjustment, to change the height to which the block will be compacted prior to stripper operation.

6. A structure as specified in claim 3; together with means mounting said starting switch for vertical adjustment, to change the height to which the block will be compacted prior to stripper operation.

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No references cited.