Oct. 30, 1951 F. T. APPLEBY 2,572,830

MACHINE FOR MOLDING CONCRETE BLOCKS

Filed May 18, 1949 2 SHEETS—SHEET 1

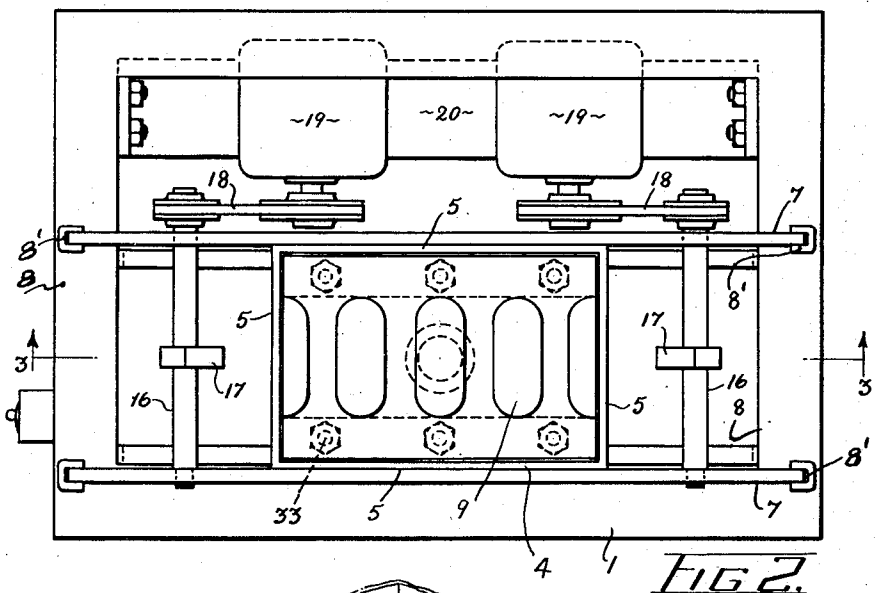


FIG 2.

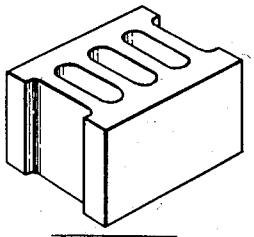


FIG 5.

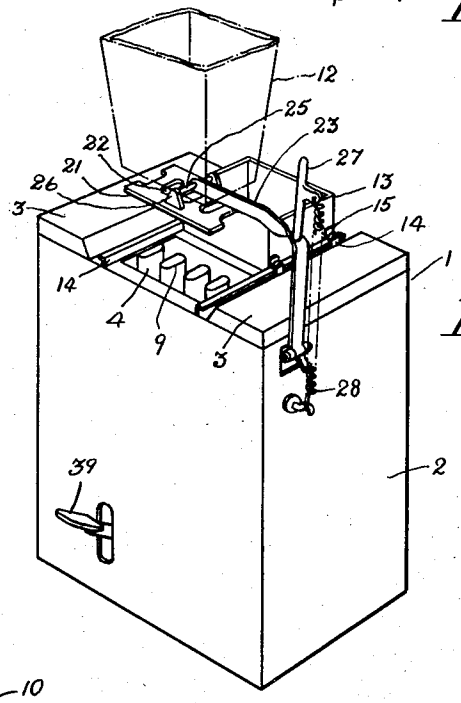


FIG 1.

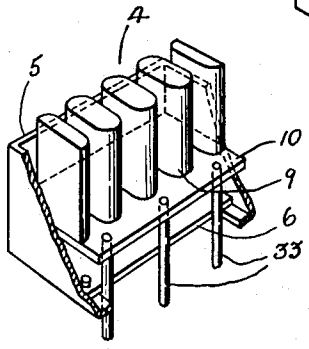


FIG 4.

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MACHINE FOR MOLDING CONCRETE BLOCKS

Filed May 18, 1949 2 SHEETS—SHEET 2

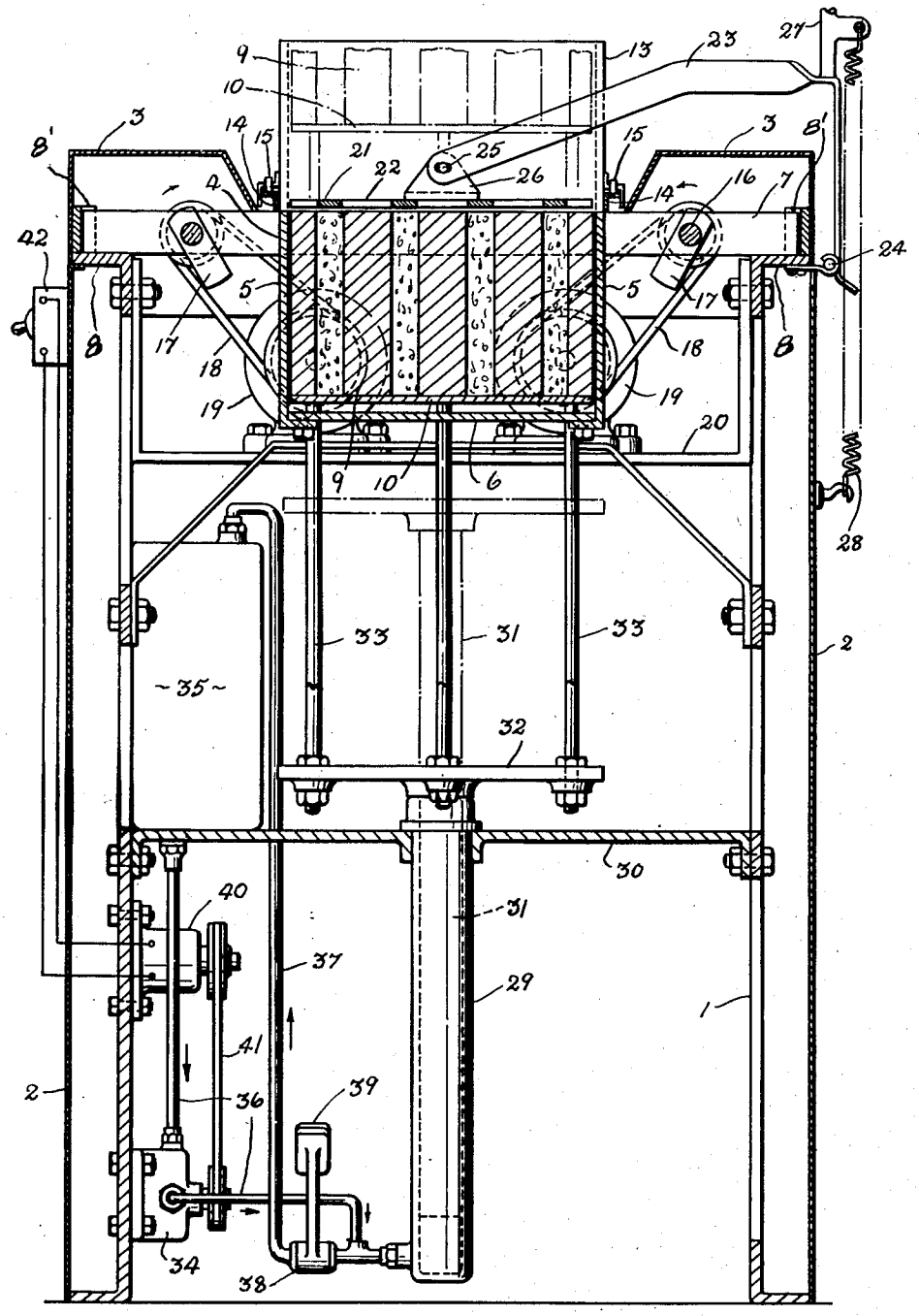


FIG 3.

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MACHINE FOR MOLDING CONCRETE BLOCKS

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3 Claims. (Cl. 25—41)

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My invention relates to improvements in machines for manufacturing the well-known type of cement block used in buildings.

The object of the invention is to provide an improved machine of this kind in which building blocks can be rapidly made with a minimum of effort on the part of the attendant, and one which will turn out a product which on account of its physical characteristics is readily acceptable to the building trade in that it is capable of withstanding high compressive stresses and is smooth walled.

The invention essentially comprises the novel construction and arrangement of a machine in which a matrix box is attached to horizontal supports having end parts which rest upon a supporting frame and are confined in recesses for upward movement so that these end parts can be individually vibrated by rotary vibrators mounted thereon to joggle the matrix box. A tamping plate is disposed over the matrix box to act on the material therein for assuring that it will be uniformly compacted in an agitating operation. The tamping place is provided with an attachment by which it can be swung away to permit of a funnel to be brought into register with the matrix box for filling the same. A hydraulic mechanism is arranged to raise a pallet plate to eject a formed building block from the matrix box for removal and curing.

An embodiment of the invention is illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective aspect of the machine.

Fig. 2 is a top plan view of the machine omitting the funnel and the tamping device.

Fig. 3 is a vertical section taken on line 3—3 of Fig. 2.

Fig. 4 is a perspective view, partly broken away, of the matrix box.

Fig. 5 is an aspect of a building block manufactured by the machine.

The machine of my invention is a unitary apparatus adapted to rest upon a supporting surface, such as a floor. In the selected form herein disclosed it comprehends a sturdy upright frame, denoted as a whole by the reference character 1, which is of the skeletal type and is enclosed by side plates 2 and top covers 3 desirably detachably secured in place.

At the top of said frame there is provided a matrix box 4 in which a standard building block, such as that shown in Fig. 5, is moulded. The matrix has a cavity of the required size, which is formed by the fixed side walls 5 and bottom wall or floor 6, which leaves the top open. The matrix is rigidly secured to top cross members 7 which are horizontally arranged at each side thereof and have end parts which project from opposite sides of the matrix box to rest loosely upon the frame elements 8. Said end parts are

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confined in vertical guide slots 8' which preclude their endwise movement but permit them to move upwardly. The matrix cavity is provided with the usual arrangement of core elements 9 by which the customary openings are formed through the building block as will be well understood in the art. Said core elements upstand from the bottom wall or floor 6 to which they are affixed in approved manner.

A loose pallet plate 10 is contained in said matrix for ejection of a moulded building block. Said pallet plate is a slide fit in the matrix and is apertured as at 11 to receive the core elements 9. A hydraulic mechanism, later dealt with, serves to actuate the pallet plate.

A wet mix of cement is poured into the matrix in an ordinary manner from an overhead hopper to form a building block. Said hopper, which is not shown, is desirably equipped with a delivery spout 12, Fig. 1, which is capable of being swung to one side of the matrix between pouring operations so that the space above the matrix will be clear of obstruction when a formed building block is being removed from the machine.

In order to prevent spilling of the material in a filling operation a specially designed funnel is employed. This funnel is a box-like member 13 open at its top and bottom to provide a passage therethrough, the size of which conforms to the mouth of the matrix. Said funnel is disposed over the matrix in register therewith for receiving material from the hopper spout 12 in a pouring operation, and is slidable rearwardly of the matrix so that it may be moved clear thereof after a pouring operation. To enable the funnel to slide it is supported on tracks 14 by means of wheels 15. Said tracks extend transversely of the ends of the matrix and are secured to the frame 1 in an appropriate manner. The wheels 15 are applied to said funnel in approved manner. According to this arrangement the funnel is stationed over the matrix only at the time that material is being poured into the matrix, and when the matrix has been filled the funnel is pushed aside by the attendant clear of the mouth thereof so that it will occupy the rearward position in which it is shown in Fig. 1.

After the matrix has been filled it is joggled by a vibratory mechanism in order to compact the material therein in a form-retaining shape for subsequent curing, as is the usual practice.

The vibratory mechanism comprises a horizontal shaft 16 arranged transversely of said top members 7 and journalled in said end parts thereof at each end of the matrix box. Each shaft carries an eccentric weight mass in the form of a weight piece 17 which is keyed or otherwise secured in place and preferably located between adjacent end parts of said top members. Each shaft is desirably independently driven as

by a belt drive 18 from an electric motor 19 supported on the frame 1 by means of a bracket 20. Said motors are concurrently operated and are controlled by an ordinary switch in the electric circuit from a source of supply, which switch may be conveniently located on the machine. Said weight pieces are oppositely rotated at high speed. In actual practice it has been found that by vibrating the end parts of the top members 7 a highly satisfactory joggling motion is imparted to the matrix box by which the material is quickly and firmly compacted. Since the top members 7 are free to move upwardly in the guide slots 8' it will be understood that the rotary vibrators induce vibration in this direction. On account of the effectiveness of the vibratory action a building block is produced, which when cured, is possessed of desirable characteristics in that it is capable of withstanding high compressive stresses and has smooth faces.

To assure that the material will be compacted uniformly throughout the depth of the mould cavity and to overcome the tendency for it to pack more tightly at the bottom than at the top thereof, it is desirable to employ a tamping plate 21. Said tamping plate is of a size to fit in the mould cavity and is disposed thereover. It is apertured as at 22 to receive the core elements 9 and is disposed to rest freely upon the material within the mould cavity when the matrix box has been filled. Said tamping plate is attached to an arm 23 by which it is swung away from the matrix box when a building block has been formed ready for removal. The arm 23 is pivoted at 24 to a side of the frame 1 for swinging upwardly and is likewise attached to the tamping plate as by a pin 25 fitted in lugs 26. The swing of said arm may be limited by a stop piece. A handle 27 is provided on the arm and a tension spring 28 acts on the arm in swinging the tamping plate clear of the matrix box. An end of said spring is connected to the arm and the other end thereof is attached to a part of the frame 1. Said spring is so arranged with respect to the pivot 24 that it does not act to swing the arm when the tamping plate is disposed in its operable position at the mouth of the matrix box, as shown in Fig. 3. When the arm is given an initial upward swing by means of the handle 28 the spring then comes into action to continue the upward swing of the arm in order to raise the tamping plate clear of the matrix box so that a formed building block may be ejected without obstruction.

The hydraulic mechanism for ejection of a formed building block comprises a fluid cylinder 29 vertically arranged beneath the matrix box 4 and supported in approved manner on the frame 1 as by a bracket 30. The ram or piston 31 projects upwardly from said cylinder and carries a cross plate 32 to which is secured a plurality of spaced ejector bars 33. These bars extend upwardly through guide holes in the bottom 6 of the matrix box and abut the pallet plate for raising it under fluid pressure.

The cylinder is actuated by liquid delivered under pressure by means of a standard pump 34 connected to a reservoir 35 by means of the delivery piping 36 and the return piping 37. A control valve 38 is interposed in said return piping and provided with a lever 39 in the form of a pedal so that the attendant can work it by foot pressure. The pump is driven by an electric motor 40 to which it is connected by a belt drive 41. A switch 42 is located on a part of the frame 1 for controlling the electric circuit to the motor. Assuming that the pump is in operation, it is only necessary for the attendant to press on the pedal 39 in order to open the valve 38 to cause the cylinder to raise the pallet plate in an ejection operation.

From the preceding description it will be evident that in the use of the machine the tamping plate 21 is swung away from the matrix box by means of the arm 23, which permits the funnel 13 to be pulled forwardly into register with the mouth of the matrix box for a filling operation. Cement is then poured into the funnel to fill the matrix cavity, after which the funnel is pushed back clear of the matrix box and the tamping plate is swung down into operational position where it rests upon the material. The weight pieces 17 are then rotated for a brief interval of time by the running of the motors 19 in order to uniformly pack the material by the vibratory motion which is set up and which imparts vibratory movement to said tamping plate. Following the compacting operation the moulded building block is ejected by the hydraulic mechanism and is removed from the machine along with the pallet plate. Another pallet plate is used for making the next building block, and so on.

The invention provides a machine capable of rapidly manufacturing building blocks and one which requires little effort on the part of the attendant. Obviously such changes and modifications can be resorted to as fairly come within the scope of the sub-joined claims.

What I claim is:

1. In a machine for making building blocks, a matrix box, horizontally arranged supporting members rigid with said box and extending outwardly from opposite sides thereof, a frame provided with horizontal seating surfaces upon which said supporting members rest loosely, guide means for confining said supporting members to a vertical movement so that said supporting members and the matrix box may move upwardly as a unit, a shaft transversely journalled on each of said supporting members, a weight piece eccentrically secured to each shaft, and power means on said frame for driving said shafts, said power means including flexible devices for enabling said supporting members to have unhampered vibratory motion under the influence of said weight pieces.

2. A machine as defined in claim 1, and in which the matrix box is open at the top, and in which the supporting members are disposed at the top of the box.

3. A machine as defined in claim 1, and in which the power means includes an independent drive for the shaft on each of the supporting members, each independent drive comprising an electric motor having a belt and pulley connection with the respective shaft, said electric motor being disposed at the inner side of the shaft.

FREDRICK T. APPLEBY.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,231,064	Fearn	Feb. 11, 1941
2,320,759	Stacy	June 1, 1943
2,396,999	George	Mar. 19, 1946
2,397,695	Schutt	Apr. 2, 1946