

J. A. FERGUSON.
 CONCRETE BLOCK MAKING MACHINE.
 APPLICATION FILED OCT. 19, 1916.

1,237,887.

Patented Aug. 21, 1917.

3 SHEETS—SHEET 1.

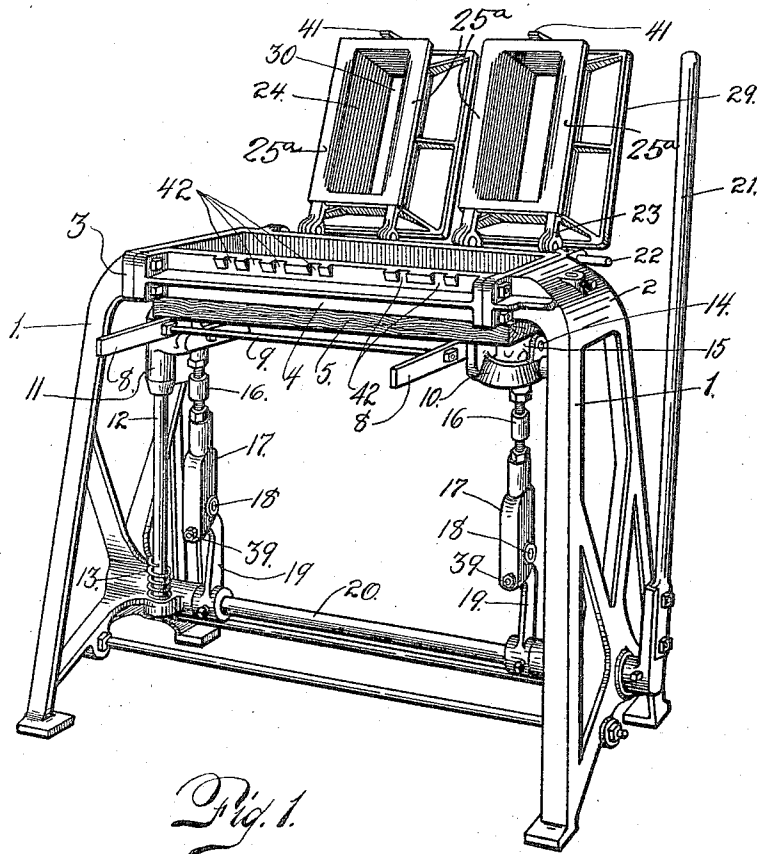


Fig. 1.

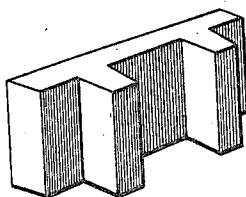


Fig. 2.

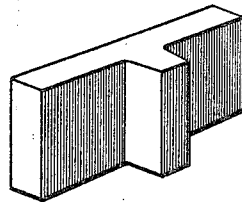


Fig. 3.

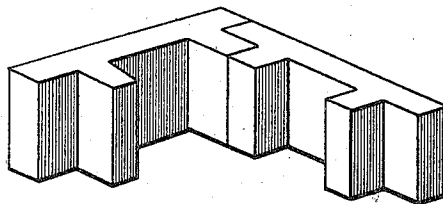


Fig. 4.

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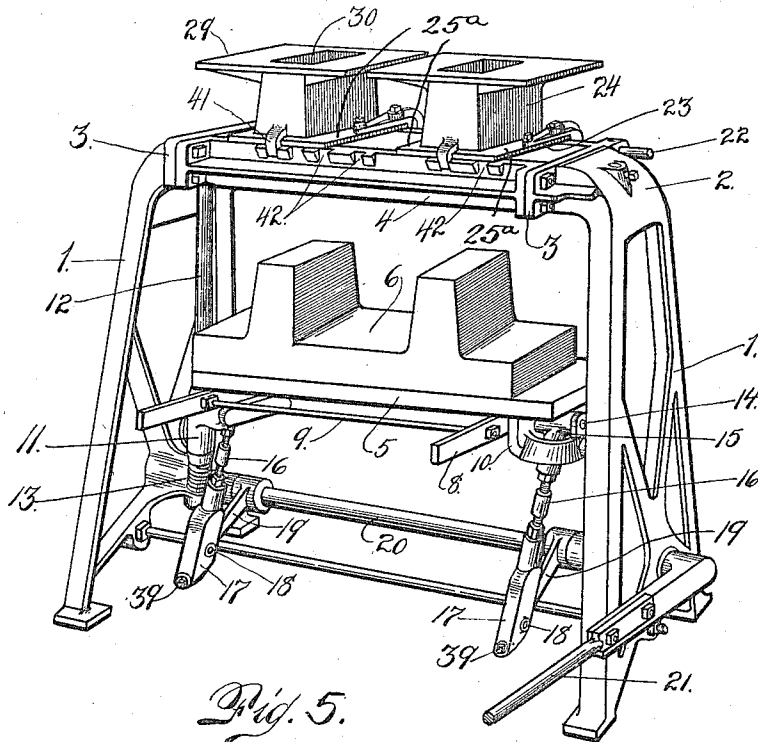


Fig. 5.

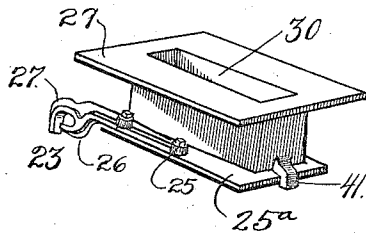


Fig. 6.

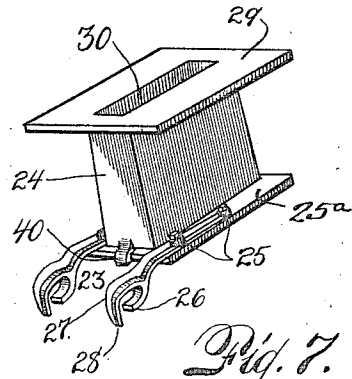


Fig. 7.

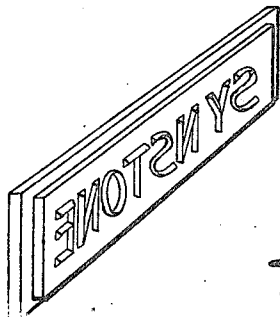


Fig. 13.

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3 SHEETS—SHEET 3.

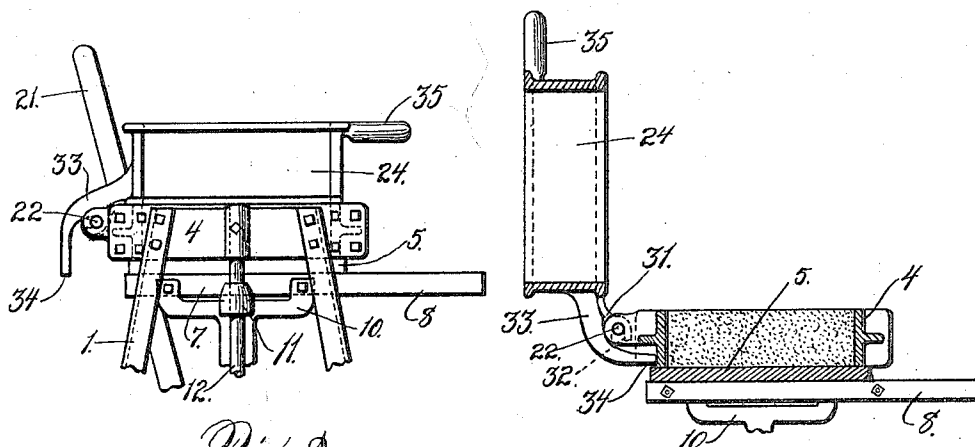


Fig. 8.

Fig. 9.

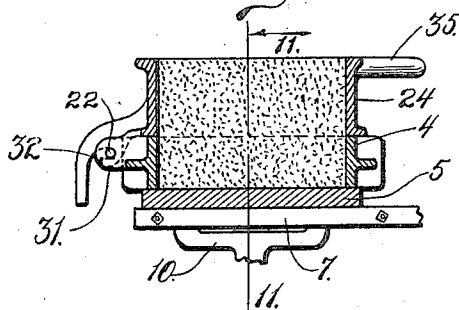


Fig. 10.

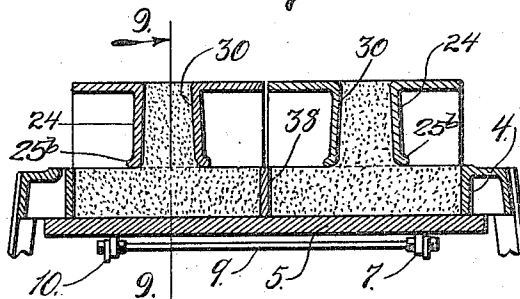


Fig. 11.

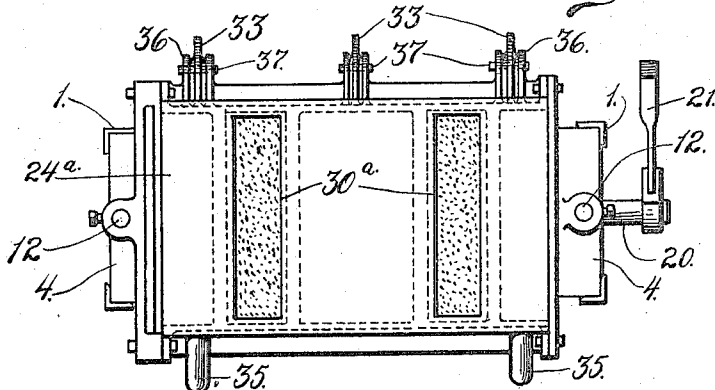


Fig. 12.

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UNITED STATES PATENT OFFICE.

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CONCRETE-BLOCK-MAKING MACHINE.

1,237,887.

Specification of Letters Patent.

Patented Aug. 21, 1917.

Application filed October 19, 1916. Serial No. 126,609.

To all whom it may concern:

Be it known that I, JOHN A. FERGUSON, a citizen of the United States, residing at the city and county of Denver and State of Colorado, 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 improvements in block forming machines.

It is primarily designed for molding concrete building blocks, and while in the specification and claims I shall so refer to it as a concrete block making machine, it will be understood that I do not limit myself to its use in manufacturing concrete blocks *per se*, as it will be obvious from the following disclosure that my machine may be employed in other analogous uses, and I intend the term "concrete" to include equivalent types of composite building blocks of appropriate formations, and whether or not they are veneered with a slab or a finished facing surface in imitation of stone, marble or otherwise, as frequently occurs in this art.

Apparatus for this purpose, as heretofore employed, has required a concrete mixture containing not too much water to provide a mass of a sufficiently stiffened consistency to enable the molded block to retain its shape, until fully hardened and set, upon removal from the mold.

It is now recognized, however, that better results are obtained when a plenty of water is used, and that finished blocks made from a mixture containing an insufficient amount of water, even though thoroughly indurated, are very porous, absorptive and otherwise defectively weak, providing a poor wall building material, whereas a wall structure of superior resistance strength, against crushing pressure, and absolute dryness is not only desired but highly essential.

The broad aim of the present invention, therefore, is to provide a highly efficient machine that will so permit of the satisfactory molding of concrete building blocks, from just as plastic a cementitious mixture, as consistently possible, to insure the best results, and at the same time with a machine that is simple in construction and operation,

55 durable in use, and comparatively inexpensive to manufacture and operate.

Other objects and advantages of my improved construction will appear from the following description and the drawings forming a part of this application, the particular features of novelty of the invention being succinctly stated in the appended claims.

Referring now to the drawings, in which like characters designate the same part in the several views

Figure 1 is a perspective view of the preferred form of a machine, involving the principles of my invention, the platen or work support being shown in its elevated position, to form a bottom closure for the main mold section, and the auxiliary lug molding sections being swung back out of operative position.

Figs. 2, 3 and 4, are perspective views, simply illustrative of some of the styles of blocks that may be made with my improved machine, Fig. 4, showing two of the blocks of Fig. 2 as associated at a corner of a wall.

Fig. 5, is a perspective view, substantially similar to Fig. 1, but with the auxiliary lug molding sections closed in operative position, and the movable platen lowered from the main mold section, with a finished block appearing thereon as withdrawn from the mold sections.

Fig. 6, is a perspective view of one form of a suitable type of lug molding section locking toward the front thereof.

Fig. 7, is a perspective view of a substantially similar form of lug molding section, of larger proportions, and looking toward the rear thereof.

Fig. 8, is a view in end elevation of the upper part of a similar machine, but showing a slightly modified arrangement of the lug molding sections, and the means for detachably hinging same to the main mold section.

Fig. 9, is a transverse sectional view, taken along the line 9—9 of Fig. 11, with the lug molding elements thrown open out of operative position, and the main mold section filled with the concrete mixture.

Fig. 10, is a sectional view similar to Fig. 9, but with the lug molding elements closed in operative position, and the complete mold filled with the concrete mixture.

Fig. 11, is a longitudinal sectional view, of the style of molds shown in Fig. 8, taken along the line 11—11 of Fig. 10.

Fig. 12, is a plan view looking down on Fig. 8, but slightly modified in that the lug molding elements comprise a unitary structure, with a plurality of lug molding pockets therefor, instead of being formed of sections, and

Fig. 13, is a perspective view of an expression plate, which may also be supplied with a negative die of a trade name, adapted to be impressed upon the upper face of one or more of the lugs, and which plate is adapted to be placed upon the top of the finished lugs and slightly tapped to start the molded block from the mold.

1 designates the frame work of the machine of any suitable sub-structure, shown as comprising metallic side standards, cast to form inturned heads 2, between which is longitudinally disposed the main mold section 4, the end walls of which abut against opposed spaced flanged head faces 3, and the whole being held securely bolted in position, as shown, with the main mold section 4 forming the top of the sub-structure.

The main mold section 4 is completely open at the top and bottom, consisting of side and end walls only.

A replaceable platen 5, comprising a suitable pallet element, is mounted on a vertically movable platen support, being operable thereby to close and provide a bottom for the main mold, when the platen support is elevated, and also functioning as a removable carrier for the molded block 6, when the platen support is lowered and the finished block is withdrawn from the mold, as shown in the position indicated at Fig. 5. The pallet element or platen board 5 does not operate through the main mold to eject the molded block from the top thereof, the molded block being withdrawn from the bottom. The preferable arrangement is to employ a platen board of greater dimensions than the open bottom of the main mold, so that when elevated, to close the bottom thereof, it will not enter the main mold, its upward movement being limited by its engagement with the bottom edge faces of the walls of the main mold.

This platen support 7 may simply be in the nature of an open frame, consisting of end bars, having forwardly projecting shelf-like extensions or guides 8, and the longitudinal tie-rods 9, and in turn the platen support is carried by suitable end brackets 10, having branched arms, and provided with slide elements, shown as sleeves 11, slidably mounted on vertical guide rods 12, suitably secured to the frame work, and near the lower ends of which may be mounted, if desired, spring buffers 13, against

which the sleeves 11 engage in their descent to take up any possible jar.

Between the bifurcated or spaced arms of the end brackets 10 are mounted bearing pins 14, on which are journaled the upper heads 15 of link connections 16, the lower heads 17 of which are in turn pivotally connected, as at 18, to short lever arms 19 of a rock shaft 20, suitably journaled on the frame work 1, and provided at one end with an operating hand lever 21. For nicety of adjustment the link connections 16 may include threaded rods and a turn-buckle element as shown.

Various modified lug mold forms may be employed, both as to details of construction and dimensions, to meet conditions of molding the blocks of specially desired contours and sizes, and the lug mold sections may in some cases be of unitary structure, or comprise separate members, suitably associated with the top of the main mold section.

Referring to Figs. 1, 5, 6 and 7, there is illustrated a preferred general type of lug mold sections (of which there may be obvious variations as to dimension and form) associated with the main mold section, either as a single unit or as a pair or more of units, dependent upon whether one or more lugs are to be formed on the blocks.

In this particular arrangement, a hinge rod 22 is located at the rear top of the machine, to which rod securing arms 23, carried by the lug mold sections 24, are detachably secured both in pivotal and sliding relation to the rod.

As more clearly shown in Figs. 6 and 7, these arms (instead of being integrally formed lugs, which they might well be) are preferably separate elements, bolted as at 25 to the bottom side flanges 25^a of the lug mold sections. They are preferably cast to provide at one end a concave under lip 26 and an overhanging lip 27, terminating in a projecting stop lug 28, and the whole providing a claw-like detachably pivotal bearing, which also permits of the adjustment of the lug mold sections, along the rod 22, to desired positions above the main mold 4 and platen 5.

These mold sections 24 are provided with lug forming pockets 30, the side walls of which are preferably slightly convergent so that the formed concrete lugs will have a tapering surface, adapting them for more ready withdrawal from the forms. The upper portion may be flanged as at 29, providing a table-like surface to facilitate the filling of the forming pockets 30, and also functioning as a cover or guard plate to prevent the concrete mixture from falling on to the main body portion of the blocks.

To hold the lug mold sections properly

seated in their several adjusted positions, they may have a rear and a forward integral locking lug 40 and 41, respectively, cooperating with a notched portion of the main mold section, providing recesses 42, shown at the front of the machine only in the figures.

In Figs. 8 to 11, the principles are substantially the same, excepting for the means for detachably pivoting the lug mold sections, which may be separate elements, as indicated in Fig. 11, substantially adjustable as in Figs. 1 to 5, or they may be, as shown in plan in Fig. 12, formed as a unitary structure, with a plurality of lug forming pockets.

As separate elements, they would be pivotally connected to and in sliding engagement with the rod 22 to function as described with reference to Figs. 1 and 5, but if of unitary structure they might simply be pivoted to individual hinge pins, hereinafter referred to in connection with Fig. 12.

The practically minor difference is in the form of the pivotal securing means, which in these figures simply comprise the lugs or short arms 31 formed integrally with the lug mold sections, and having a rearwardly opening slot 32 to provide a detachably pivoted bearing with the rod 22, or the hinge pins of Fig. 12, referred to. And instead of the overhanging lip 27 and stop 28, I provide an integral curved arm 33 the end 34 of which forms an equivalent stop, abutting against the main mold 4 to limit the rearward swing of the lug mold sections, as clearly indicated in Fig. 9. 35 simply indicate hand holds for the lug mold sections.

In Fig. 12, the lug mold section 24^a is of unitary structure, which form may satisfactorily be employed where no change in the disposition of the mold forming pockets is required, and hence adjustment along the top of the main mold unnecessary. In this form, two or more lug forming pockets 30^a are arranged in the unitary mold section, and spaced ears 36 or similar projections from the main mold are provided with hinge pins or pivots 37 engaged by the slotted lugs 31 of the lug mold section as heretofore explained.

39 in Figs. 1 and 5 simply indicates adjustment set screws associated with the link connections and rock shaft levers, for positioning them in direct alinement for upward position of registration.

From the foregoing complete description, taken with the drawings, it is believed that the operation of the machine will be fairly apparent, but the same may be briefly stated with reference to molding a two lug block, such as shown in Fig. 2,

With the lever 21 thrown rearwardly to elevate a supported platen 5 into abutting engagement with the bottom of the main mold, thus exteriorly closing the otherwise open bottom of the main mold section 4, and with the auxiliary or lug mold sections 24 moved to their open positions, as shown in Figs. 1 and 9, the main mold section 4 is then filled with the cementitious mixture and thoroughly tamped to form the base of the concrete block.

The lug mold sections are then closed as best illustrated in Figs. 10 and 11 (and locked by the lugs and notches 41 and 42, as in Fig. 5) when the pockets 30 of these sections are also filled with the concrete mixture and the resultant lugs caused to become integrant parts of the base of the block, after which the completed composite block is ready for withdrawal from the mold, the removable platen serving also as a carrier support for the composite block until it has become fully hardened or set.

It will be understood that the concrete mixture contains a substantial quantity of gravel, broken stone or the like, in addition to its binding cement, and it is of a sufficient consistency to avoid any appreciable displacement or distortion of the mixture in the main mold, forming the main body of the block, owing to the weight or pressure of the mixture in the lug mold sections above; but any such tendency is further avoided by the bottom side flanges 25^a of Figs. 1, 5, 6 and 7, or their equivalent outwardly spreading bottom edge beads 25^b of Fig. 9.

Expression plates, such as shown in Fig. 13, may be employed, if desired, to slightly start the formed block from the mold forms. This may be done by placing them in position in the upper opening of the mold forms 30 and slightly tapping them, and at the same time the negative die thereon will impress a suitable trade mark on the molded lugs.

The lever 21 being then thrown forwardly, the platen supporting frame, with its removable platen and molded block thereon, through its link connections with the lever operated rock shaft, will be lowered to the position of Fig. 5, and that platen with its block may be slid out on the guides 8 and replaced by another platen, when the operations may be repeated indefinitely.

It will be obvious that, where it is simply desired to manufacture two-lug blocks of uniform shape and dimensions, a unitary auxiliary lug mold section, such as shown in Fig. 12, may satisfactorily be employed. If one-lug blocks, as shown in Fig. 3, are to be made, it will only be necessary to use but one of sectionally arranged lug mold sections of Figs. 1, and 5 to 12, and it be-

ing properly adjusted over the main mold, a central or otherwise one-lug block may be formed. Also the distance between the lugs, where two or more lugs are formed, or their positions relatively to each other, or their dimensions, may be regulated by the employment of proper lug mold forms and their adjustment above the main mold. So also, in either type of machine, the dimensions of the base of the blocks may be determined by the insertion of a division plate or plates 38, as in Fig. 11, where for illustration there is shown a plurality of blocks formed at one time, each having a single central lug.

Finally, it will be further obvious that, while for simplicity there is merely shown a machine of restricted width, the number and kind of blocks that may be manufactured at one time is only limited by the length of the main mold section, and its damming off by division plates 38, and the number and form of the auxiliary lug mold sections employed, which latter may be readily detached or attached as desired.

It will be understood that I do not limit myself to the exact disclosure made, excepting as restricted by a fair construction of the scope of the ensuing claims, contemplating the use of a full range of equivalents in actual manufactural structure, but having thus fully shown and described certain practical embodiments of the invention, what I do claim is:—

1. In a concrete block making machine, the combination of a main mold, open at top and bottom; an auxiliary mold, embodying a lug forming pocket, mounted to be adjustable longitudinally along the open top of said main mold to varying positions; a platen of greater dimensions than the open bottom of said main mold and operably supported under the latter; and means for operating said platen upwardly into closed engagement with the open bottom of said main mold to provide a bottom closure

therefor, and downwardly to withdraw the finished block from out of the bottom of the mold, when molded, substantially as described.

2. In a concrete block making machine, the combination of a main mold, open at top and bottom; a guide element extending longitudinally of said main mold; an auxiliary mold, embodying a lug forming pocket, adapted to close over the top of said main mold; means for mounting said auxiliary mold in both pivotal and sliding engagement with said guide element; a platen operably supported beneath said main mold; and means for operating said platen to function substantially as described.

3. In a concrete block making machine, the combination of a main mold, open at top and bottom; a plurality of auxiliary molds, each providing a lug forming pocket, cooperatively mounted on the top of said main mold and adjustable toward and away from each other longitudinally thereof; a platen operably supported beneath said main mold; and means for operating said platen upwardly to provide a bottom closure for said main mold and downwardly to withdraw the molded block from its mold sections, substantially as described.

4. In a concrete block making machine, the combination of a main mold, open at top and bottom; a guide element extending longitudinally of said main mold; a plurality of auxiliary molds, each providing a lug forming pocket; means for mounting said auxiliary molds on the top of said main mold, independently of each other, in readily detachable pivotal and sliding engagement with said guide element; a platen operably supported beneath said main mold; and means for operating said platen to function substantially as described.

In testimony whereof, I affix my signature.

JOHN A. FERGUSON.