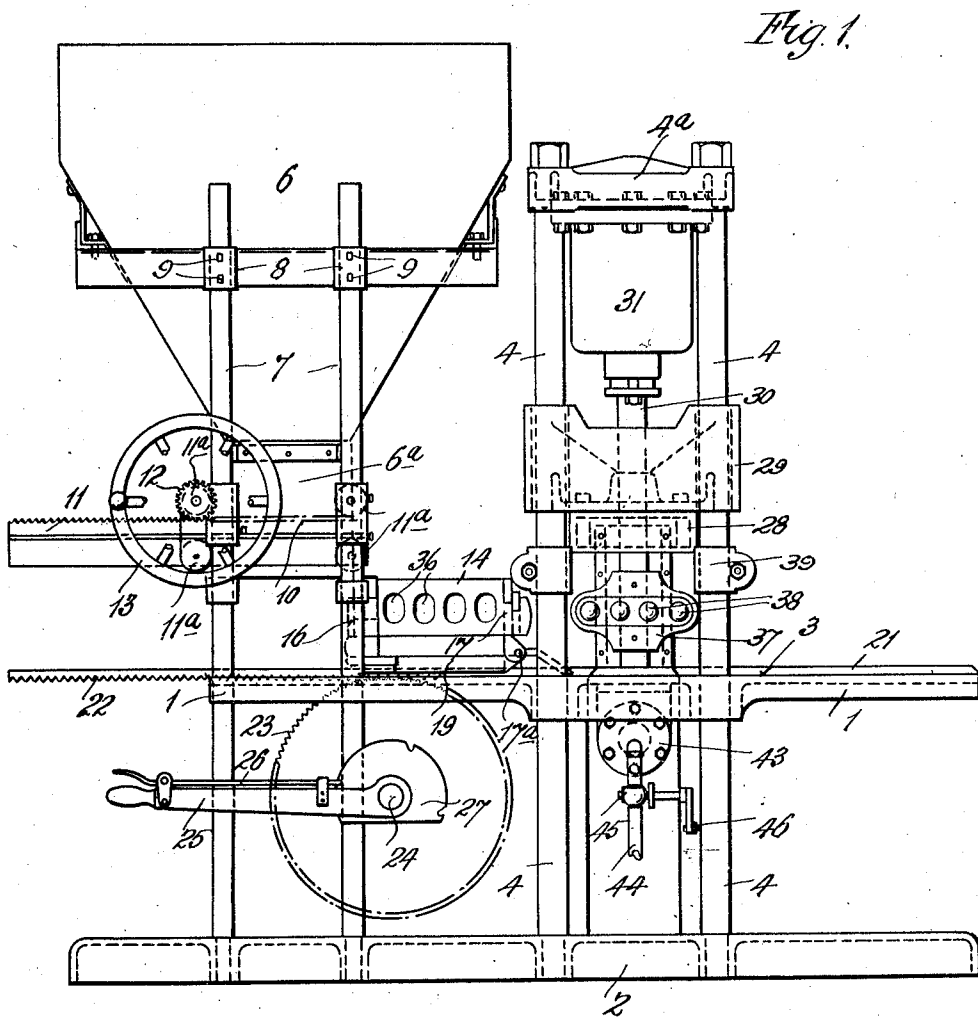


F. M. JOHNSON.
MACHINE FOR THE MANUFACTURE OF BUILDING SLABS, &c.
APPLICATION FILED DEC. 15, 1919.

1,361,064.

Patented Dec. 7, 1920.

3 SHEETS—SHEET 1.



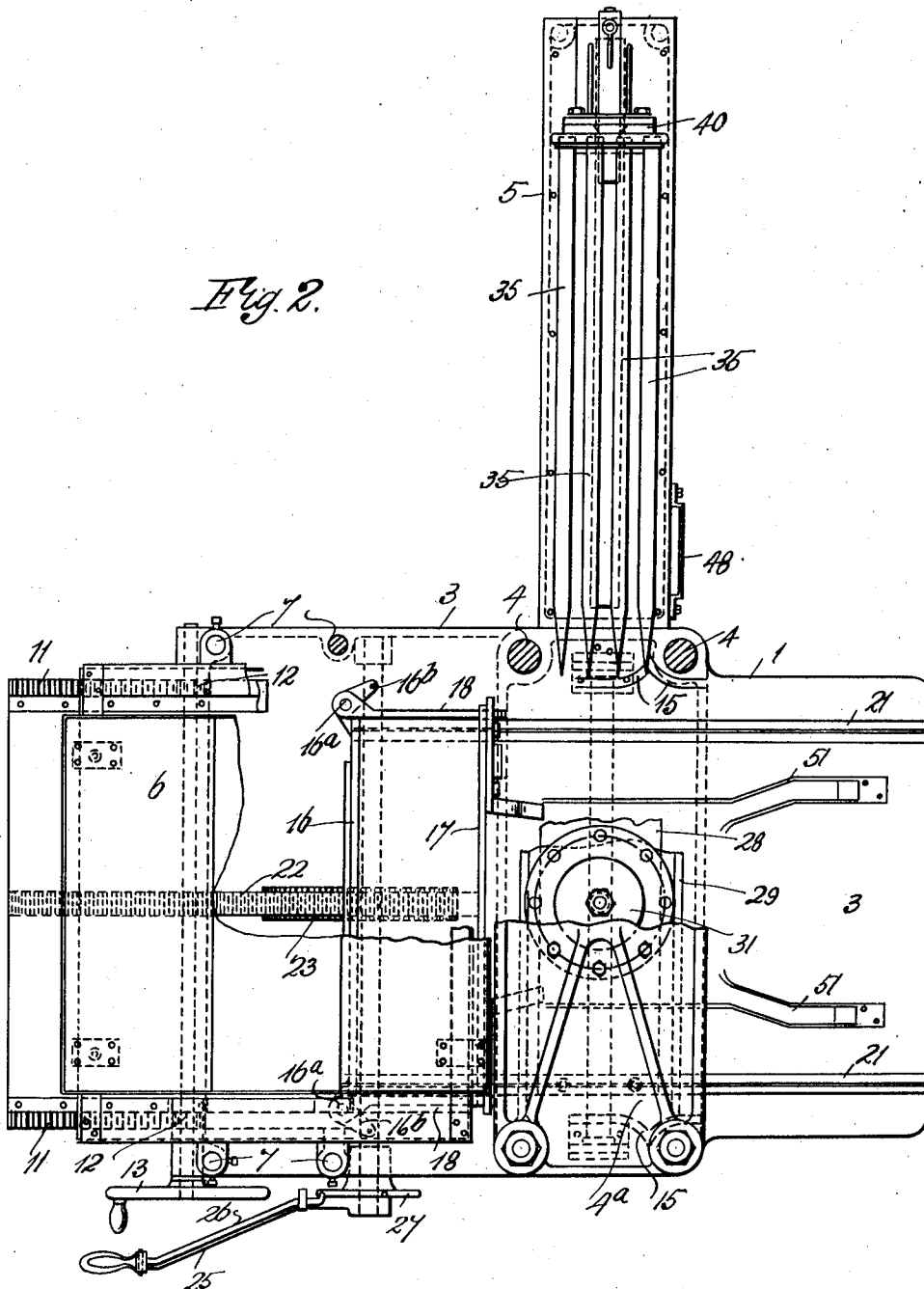
Inventor:
Frank Mihill Johnson.
Attorney: R. H. Haddaway

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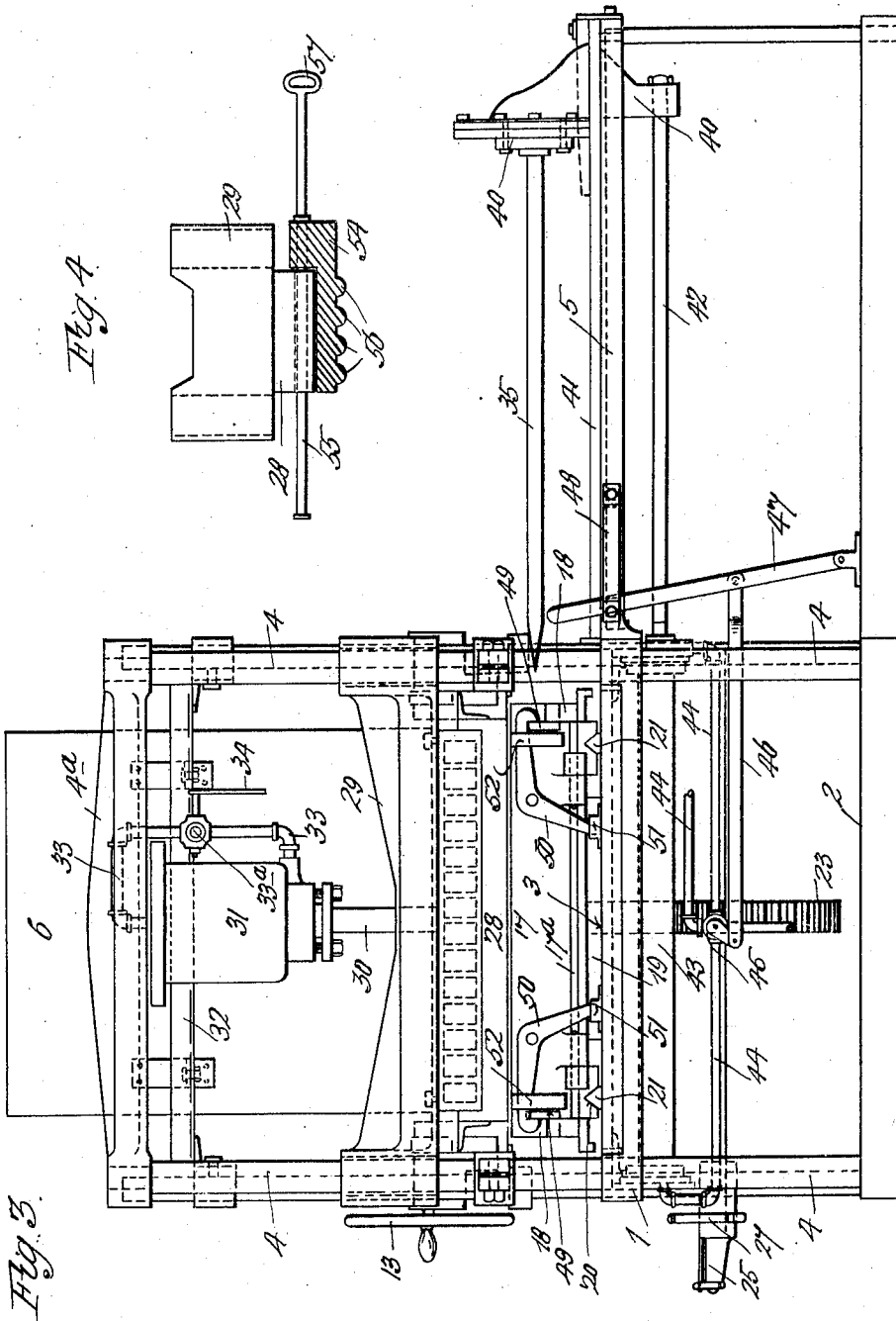
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Inventor:
 Frank Mihill Johnson.
 Attorney: R. H. Anderson

UNITED STATES PATENT OFFICE.

FRANK MIHILL JOHNSON, OF MITCHAM, ENGLAND, ASSIGNOR OF ONE-HALF TO THE FIRM OF CAFFERATA & CO., OF NEWARK-ON-TRENT, ENGLAND.

MACHINE FOR THE MANUFACTURE OF BUILDING-SLABS, &c.

1,361,064.

Specification of Letters Patent.

Patented Dec. 7, 1920.

Application filed December 15, 1919. Serial No. 345,019.

To all whom it may concern:

Be it known that I, FRANK MIHILL JOHNSON, a resident of Mitcham, in the county of Surrey, England, a subject of the King of England, have invented certain new and useful Improvements in Machines for the Manufacture of Building-Slabs, Plates, Blocks, and the like, of which the following is a specification.

This invention relates to machines for the manufacture of slabs, plates, blocks and the like (hereinafter referred to as slabs) for building and similar purposes and which are formed, for example, of a mixture of breeze and cement fed into a mold or molds and then tamped or pressed to solidify the constituents of the slab, and the present invention comprises an improved machine by means of which the complete operation of forming said slabs may be rapidly performed and the mold parts dismantled for removal of the finished slabs all in substantially automatic manner with a minimum of labor and at relatively low cost.

Broadly stated, the invention consists in a machine comprising a support upon which a mold having hinged or separable walls is adapted to be moved, with a press-head or plunger under which the charged mold is passed for tamping its contents, and means by which the mold walls are automatically released on further movement of the mold along said support from under the press head in order that the finished slab may be removed from the mold.

The invention also comprises means for providing the slabs with longitudinal holes or channels by means of an appropriate number of perforating members insertible into the slab material, for instance while the mold is under the press head, a mold wall or walls being perforated for passage of said perforating means.

An embodiment of the invention is illustrated in the accompanying drawings wherein Figure 1 is a side elevation of the improved machine. Fig. 2 is a plan view with parts broken away to show other parts beneath. Fig. 3 is an end elevation seen from the right hand of Fig. 1, and Fig. 4 is a sectional detail view of a modification hereinafter described.

The machine illustrated comprises a main frame structure comprising side frames 1 mounted on a base 2 and supporting a table

3 through which extend columns 4 connected at the top by a head frame 4^a and at one side of which table is an extension or further frame 5. Above the table at one end thereof is disposed a hopper 6 for receiving the material of which the slabs are to be formed and mounted on standards 7 as by means of lugs 8 and screws 9 in order that it may be vertically adjusted on said standards to permit molds of different size or depth to be placed below same on the table 3 to receive the material from the hopper. The base 6^a of the hopper is provided with a gate, slide or like closure 10 for cutting off the discharge of material from the hopper when desired, this closure being mounted on and operated by means of racks 11 with which mesh pinions 12 carried by the spindle of a hand-wheel 13, said racks being shown as guided by rollers 11^a carried by the standards 7.

In Fig. 1 the mold 14 is shown as displaced from below the hopper after having received its charge of material therefrom. The said mold may be of any desired form provided certain of its side walls or members are capable of rapid separation or dismantling for which purpose and by reference to Fig. 2 the mold is shown as comprising a rigid back wall 16 to which are hinged at 16^a the side walls 18 and a front wall 17 hinged to the base at 17^a. The mold is carried by a base 19, which may form the bottom of the mold, provided with inverted V or knife edge shaped grooves 20 adapted to slide on similarly formed guides or rails 21 on the table 3, so that it may have easy sliding movement in a horizontal plane on said table, and this movement of the mold is shown as effected by means of a rack 22 secured to the mold base and engaged by a relatively large toothed wheel or circular rack 23, on the shaft 24 of which is secured a hand lever 25 under control of the operator and carrying a detent rod 26 cooperating with a notched segment 27 secured to one of the standards 7.

The mold, after filling, is moved along the guides 21 to a position below a tamping device which comprises a plunger or block 28 adapted to fit between the walls of the mold and press or tamp the material therein, said plunger being carried by a cross-head 29 adapted for vertical sliding movement on the columns 4 above mentioned. Any con-

venient means for operating said cross-head to perform the tamping operation may be adopted whereby the plunger is first brought into contact with the upper surface of the material in the mold under somewhat slight pressure to compact the material in the mold and subsequently under much greater pressure. The operating means shown in the drawings, however, are of the hydraulic variety, for which purpose the cross head 29 is connected to the ram 30 of the hydraulic cylinder 31 carried by a cross-bar 32 supported at the upper ends of the columns 4, the movement of the plunger being controlled by a pipe-system 33 having a valve 33^a operable by a rod 34 carried to within reach of the operator.

If the slab to be formed is to be of that class which is provided with one or more longitudinal holes or channels, these may be produced at the stage immediately following the initial compacting pressure of the plunger by inserting from one end of the mold one or more pointed rods, pipes or the like 35, provision being made for four of same in the construction under consideration. For this purpose the end walls 18 of the mold are perforated as at 36 and at the end remote from that at which such rods enter the mold a cap or equivalent 37 is provided having bosses 38 to receive the pointed ends of the rods, said cap being carried by a bracket 39 mounted on the columns 4. The perforating rods 35 are mounted at their rear ends on a head or block 40 adapted to slide on guides 41 carried by the table extension 5, and this head is operated hydraulically by means of a rod 42 below the table and constituting the plunger of a second hydraulic cylinder 43 with which is connected a pipe system 44 containing a valve 45 operated by rod 46 and lever 47, the latter passing through a guide 48 at the side of the table extension 5. The means for controlling the actuation of the rods 35 are thus independent of the means for controlling the tamping operation, and when the said rods have been inserted into the slab material in the mold much greater pressure on said material is exerted by the plunger 28 and when this pressure has been sufficiently carried out, the perforating rods 35 having been withdrawn at a convenient or desired time, the mold is moved from under the plunger and press-head farther along the table 3.

During this latter movement certain of the mold walls are separated and the means shown for this purpose are as follows:—
The side walls 18 carry lugs 49 which are engaged by catches 50 pivoted on the front wall 17 and the tails of said catches engage in cam paths 51 carried by the table 3. Said cam paths diverge from each other with the result that as the mold and its contents move

along the table, the catches are disengaged from the lugs 49 thus freeing the side walls so that they can be swung open about their hinges 16^a by arms 16^b on said hinges engaging other cam paths 15 on the table 3. Further, the front wall 17 of the mold is provided with open-ended lugs 52 behind which the catches 50 pass to engage the lugs 49 of the side walls and the action of actuating said catches as described also releases the lugs 52, thus allowing the front wall 17 to be turned down about its hinge 17^a. The molded slab can thus be readily removed, the rear mold wall 16 remaining standing or in normal position as this will have no effect on the removal or discharge of the molded slab. The mold parts can then be re-assembled for further use in a subsequent operation of the machine.

In Fig. 4 there is illustrated a device constituting a modification or addition which it may be found desirable to use when dealing with slab material which will not readily flow or become compacted around the perforating rods when the latter are inserted. This device comprises a block 54 carried by rods 55 (one at each side, but only one being shown in the figure) slidable in the plunger 28 and provided on its lower surface with semi-circular ribs 56 substantially corresponding to half the cross-section of the perforating rods 35. In the operation of the machine the use of this device is as follows:—The mold is partly filled with slab material and compacted by the plunger 28, the block having been previously moved from under the plunger by the operator by pulling on the handles 57 with which the rods 55 are provided: then the plunger is again raised and the block 54 moved thereunder, the plunger being again depressed whereby the ribs 56 will form semi-circular impressions in the slab material. The plunger is then again raised, the block 55 removed, the mold moved back to below the hopper to receive further material for a full charge and again moved under the plunger for final pressure and on insertion of the rods 35 they will engage the depressions formed in the material whereby clean perforations will be produced.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. In a building slab molding machine, the combination of a support, a hopper and a press head mounted above said support, a mold movable over the support to successive positions below the hopper and press head, separable walls for said mold, means carried by the support for automatically causing separation of said mold walls during movement of the mold along the support, means adapted to enter the material in the mold while the latter is stationary for pro-

ducing channels in said material, and means for preliminarily producing impressions in the material of the mold to partially receive the channel producing means.

5 2. In a building slab molding machine, the combination of a support, a hopper and a press head mounted above said support, a mold movable over the support to successive positions below the hopper and press
10 head, separable walls for said mold, means carried by the support for automatically causing separation of said mold walls during movement of the mold along the support, means for producing channels in the
15 material in the mold, separate hydraulic means for operating the press head and the channel producing means, and independent controlling devices for said separate hydraulic means.

20 3. In a building slab molding machine, the combination of a support, a hopper and a press head mounted above said support, a mold movable over the support to successive positions below the hopper and press
25 head, separable walls for said mold, means carried by the support for automatically causing separation of said mold walls during movement of the mold along the support, means adapted to enter the material
30 in the mold while the latter is stationary for producing channels in said material and means movable to and from cooperative re-

lation with the press head for the partial preliminary production of said channels.

4. In a building slab molding machine, 35 the combination of a support, a vertically adjustable hopper and a press-head mounted above same, a mold movable along said support to a position below the hopper to receive a charge of material therefrom, and 40 then below the press head for tamping of the charge in the mold, hinged walls for said mold, cam paths on the support engageable by elements in the mold walls to automatically open the latter on movement of the 45 mold beyond the press head, manually operable means for moving the mold along the support, a plurality of pointed perforating elements disposed laterally of the support and movable through mold walls to enable 50 the material in the mold to produce channels in the slab being formed, separate hydraulic devices for operating the press head and the perforating elements, independent controlling means for said separate hydraulic 55 devices, and a block manually movable under and away from the press head for preliminarily producing impressions in the material in the mold to partially receive the perforating elements. 60

In witness whereof I have signed this specification.

FRANK MIHILL JOHNSON.