Nov. 21, 1933. F. J. STRAUB ET AL 1,936,216

BLOCK MAKING MACHINE

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Fig. 1.

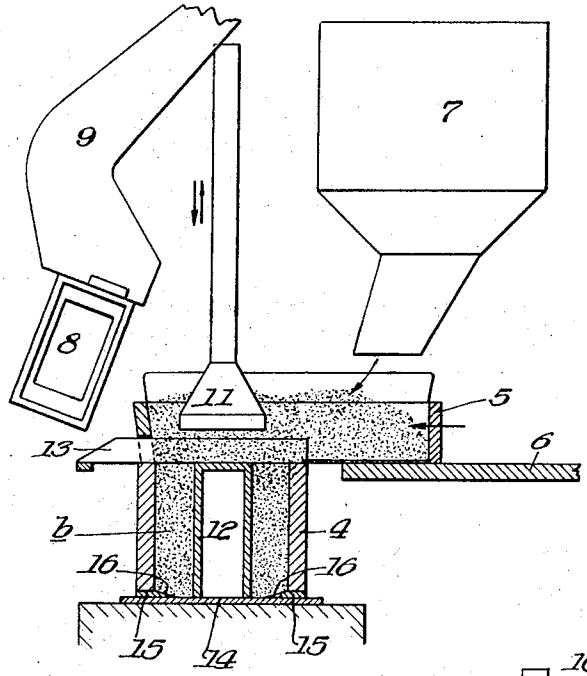



Fig. 2.

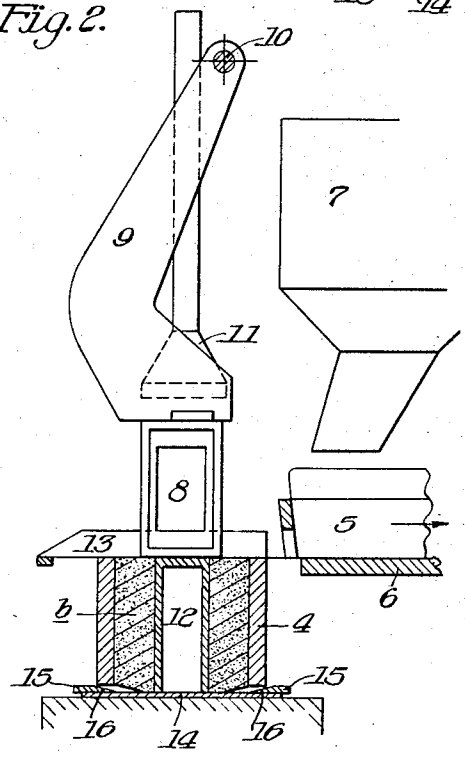
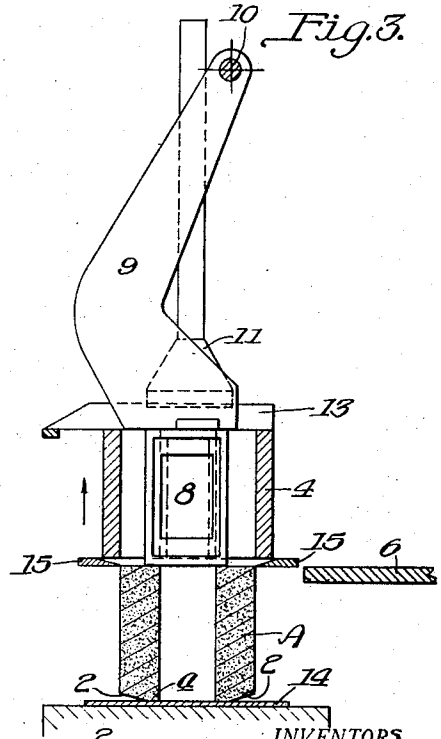



Fig. 3.




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Fig.4.

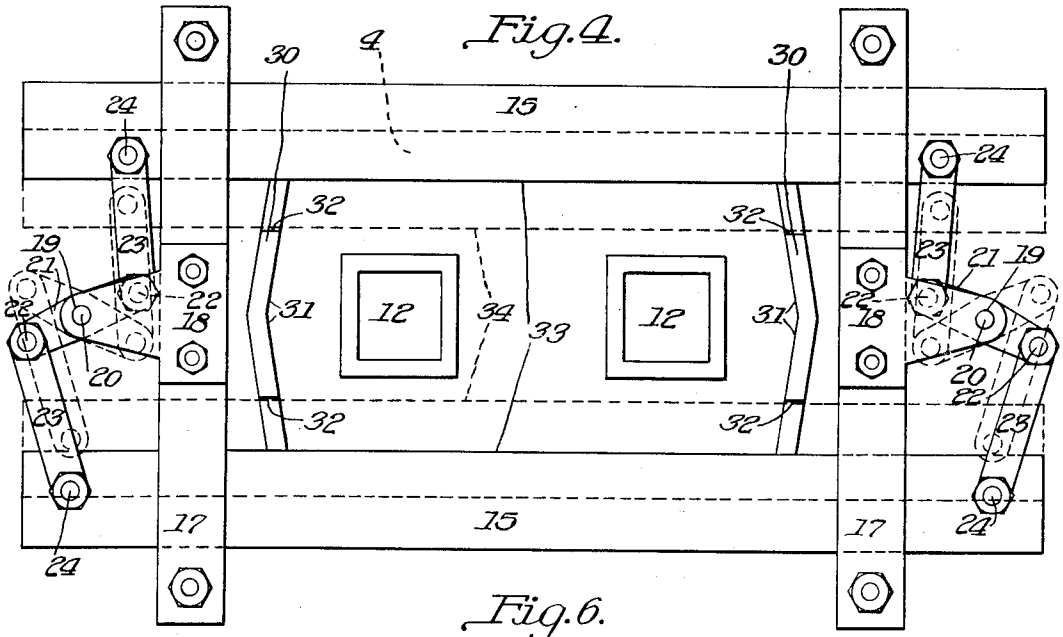
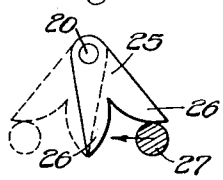



Fig.6.



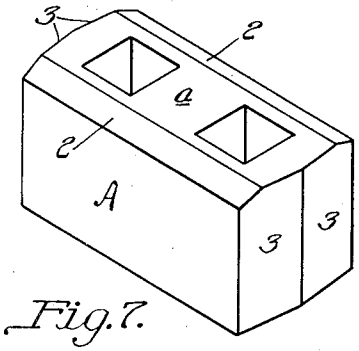




Fig.7.




Fig.5.

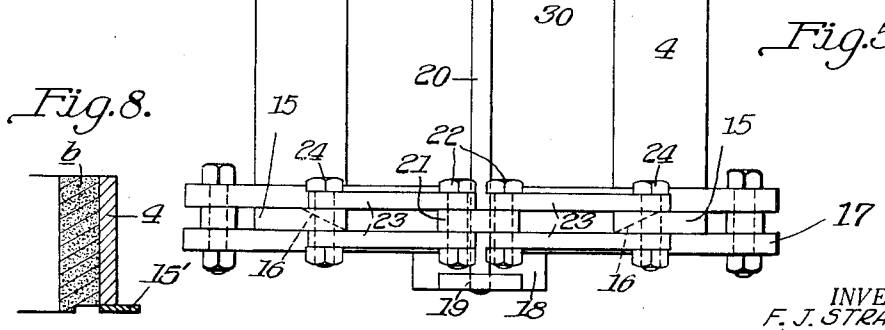



Fig.8.




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# UNITED STATES PATENT OFFICE

1,936,216

## BLOCK MAKING MACHINE

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14 Claims. (Cl. 25—41)

Our invention refers to improvements in a machine for molding building blocks and the like from plastic material by tamping action within a suitable forming mold. In such machines, as commonly used, the aggregate is delivered to the interior of the mold box, usually around one or more cores, and then subjected to the compressing action of suitable tamps. The bottom of the mold is usually open and closed underneath by a supporting pallet of suitable construction, upon which the molded block rests when ejected from the mold, and by which it may be removed for drying and storage.

Such machines, of different standard forms, utilize different forms of mold, cores, tamps, feeding apparatus, and other features of well known construction and use in the art, and are well known and understood by those familiar with the manufacture of concrete blocks, slabs, etc.

The object of the present invention is to provide, in such a machine, means whereby one face of the mold block is chamfered or beveled, at one or both opposite sides, so as to provide an intervening clearance groove between adjacent blocks supported by interior contact with each other. The object of such construction is to provide, in a resulting wall, a series of continuous open grooves for reception of mortar, cement, or other binding or closing material, after the wall has been laid up and is otherwise self-supporting.

The invention also includes means for providing similar vertical grooves between the ends of adjacent blocks, either or both forms of grooves being available as desired.

While the invention is capable of adaptation and use with various types of block-making machines, we have herein illustrated it in connection with a machine utilizing an upwardly stripping mold and ejecting stripper heads, with operative connection between the measuring or feeding hopper for the aggregate, for actuation of the groove-space forming elements.

In the drawings illustrating one preferred embodiment of the invention:

Fig. 1 is a vertical sectional view showing the mold filled with aggregate, with the stripper heads retracted preparatory to ejection of the molded block;

Fig. 2 is a similar view showing the stripper heads swung into registering position and the feed hopper withdrawn;

Fig. 3 is a similar view showing the mold elevated above the ejected block;

Fig. 4 is an enlarged view of the under side of the mold showing the groove-space forming members and their operative mechanism connected therewith, in retracted position;

Fig. 5 is a view in elevation showing the end of the mold and the actuating mechanism for the groove-space forming members in co-operative relation to the feed hopper;

Fig. 6 is a detail plan view of the opening and closing dogs for the groove-space forming members;

Fig. 7 is a view in perspective of one of the finished blocks having a pair of oppositely located groove-space bevels;

Fig. 8 is a detail sectional view showing a modified form of blade.

Referring to the block A illustrated in Fig. 7, it is generally of usual normal construction and form, approximately rectangular in shape, having opposite parallel side walls and opposite parallel top and bottom walls, and one or more transverse core openings of well known form.

One of the top or bottom faces *a* is of a width less than the full width of the block, for bearing contact against an adjacent block, for load support. The face *a* is of a width somewhat less than the full width and terminates at one or both sides in a beveled or sloping face 2, whereby to provide the desirable resulting groove or longitudinal clearance space when the blocks are placed in position.

Likewise, for the same purpose the ends of the blocks are preferably beveled as at 3 at one or both sides, leaving a similar vertical space or spaces when the blocks are in endwise contact at their maximum length middle portion. The formation of such longitudinal and vertical space-forming faces is secured by means of the improved construction herein illustrated and now described.

Referring to Figs. 1 to 3 inclusive, the mold 4 is so mounted and connected with elevating mechanism, not herein necessarily illustrated or described, that it may be lowered to filling and tamping position as in Figs. 1 and 2 and elevated for ejection of the molded block, as in Fig. 3.

A feed hopper 5 of well known construction is slidably mounted on a platform 6, below the discharge gate or spout of a superimposed bin 7, from which the aggregate may be delivered to the feed hopper in any desired quantity. The feed hopper is adapted to be moved forwardly over the mold 4 for filling and tamping, as in Fig. 1, and to be withdrawn backwardly on platform 6, when the stripper heads 8 are thrown into resisting position, as in Fig. 2.

Such heads are mounted on the lower portion

of supporting swinging arms 9 pivoted at 10 and actuated through suitable mechanism, not shown. A series of tampers 11 are also arranged for suitable operation, with provision for clearance between the stripper heads and the upwardly moving cores 12 of the machine. The latter are mounted by suitable means, as cross supporting bars 13 and proper elevating and lowering mechanism, also of well known construction and use.

A pallet 14 of thin metal, wood, or other suitable material, is supported upon a stationary foundation or frame of the machine, against which pallet the aggregate *b* of the block to be formed is compacted within the mold under action of the tamps 11. Such tamps act for a short period to evenly compress the aggregate around the cores within the mold until it is filled, after which the feed hopper 5 and any surplus material therein is withdrawn.

The space-forming elements for shaping the under side edge or edges of the block consist of one or a pair of laterally adjustable blades or plates 15 each having on its inner upper edge portion a bevel face 16, against which the aggregate is compacted.

These plates are adapted to be moved inwardly and outwardly together, when a pair is used, and such operation, in the construction shown is in conformity with the outward and backward movement of the feed hopper so as to be in position during tamping and retracted out of position during elevation of the mold and ejection of the block.

Referring now to Figs. 4, 5 and 6, the mechanism for thus adjusting the plates 15 is shown. They are mounted longitudinally along each opposite under side of mold 4 for inward and outward sliding movement between lower supporting cross bars 17, properly positioned beyond the maximum operative length of the mold at each end, and movable upwardly and downwardly therewith.

Extending outwardly from such cross bars 17, at each opposite end are brackets 18, bolted or otherwise secured to bars 17 providing outwardly extending pivotal bearings 19 for vertically arranged rotatable rods 20. Such rods are each provided at their lower ends with a lever 21 pivotally connected at opposite ends 22 with links 23, which links are pivotally connected at 24 by a bolt or other suitable pivot, with the ends of beveling plate 15.

Such mechanism is duplicated at each end of the mold, and at its upper end each pivoting rod 20 is provided with an actuating dog or lever 25. Such dog, as shown in Fig. 6, is of V form so as to be operatively engaged between its oppositely disposed prongs 26 by the downwardly extending stud 27 of an arm or bracket 28. Such arm is fixedly mounted in any suitable manner, as by an extension 29, on each opposite side of the feed hopper 5.

Thus, when the feed hopper moves outwardly away from registering position with the mold, abutment 27 will throw dog 25 and levers 21 to extend the bevel plates 15 to their outermost position. On inward movement of the feed hopper abutment or projection 27, acting in the opposite direction will effect reverse movement, bringing the bevel plates inwardly to operative position, as in Fig. 1.

It will thus be observed that the operative parts will be actuated in synchronism so as to locate the bevel plates as a portion of the bottom of the mold 4 during tamping, and to retract them out of register with any portion of the molded block, for upward discharging movement of the mold, as in Fig. 3.

When the block has been formed and the mold is about to be elevated, the stripper heads 8 are thrown inwardly to resisting position, holding the block against movement during elevation of the mold, for free release, as in Fig. 3.

The end walls 30 of the mold are outwardly sloping from each side towards the middle, providing the inner faces 31 for forming the bevel faces 3 of the block. End walls 30 are cut away, as at 32, for clearance of the inner edges of plates 15 to the extent of their inward movement. Thus, Fig. 4 shows the blades extended with their inner edges practically flush with the inner face of the side walls of the mold, as at 33, and movable by their levers to the inwardly thrust dotted line position 34.

It will be understood of course that if the horizontal clearance grooves are desired at one side only of the block, a single plate 15 may be used at such side only, omitting the blade and its lever connections at the other side, for full square corner formation in the usual manner against the pallet. Also, that if the vertical bevel 3 is likewise desired at one side only of the ends of the block, the end walls 30 will be correspondingly beveled and rectangular respectively at opposite sides of the middle of the end walls.

It will be obvious also that in place of the beveled plate 15 the groove space may be rectangular by using a parallel sided blade 15', as in Fig. 8.

The construction and operation of the invention will be readily understood and appreciated from the foregoing description.

The several parts are in such operative relation as to effect the forming and ejection of the blocks in a continuously rapid and efficient manner, while the action of the bevel plate or plates results in a comparatively smooth, finished, completely efficient beveled face from one end of the block to the other.

It will be understood that other means for actuating the bevel-forming means may be utilized, or that the invention may be variously changed or modified to adapt it to varying conditions or different types of block making machines, or otherwise modified by the skilled mechanic, but that all such changes are to be understood as within the scope of the following claims.

What we claim is:

1. In combination with an upwardly movable laterally immovable open top and bottom mold and a supporting pallet, a laterally movable resisting stripper head, and a laterally movable feed hopper; a beveling plate laterally movable between the bottom of the mold and the pallet, and means actuated by the feed hopper for moving the beveling plate inwardly and outwardly.

2. In combination with an upwardly movable laterally immovable open top and bottom mold and a supporting pallet, a laterally movable resisting stripper head, and a laterally movable feed hopper; a beveling plate on the mold laterally movable between the bottom of the mold and the pallet, lever mechanism mounted on the mold for moving the beveling plate inwardly and outwardly, and an actuating element therefor on the feed hopper.

3. In a block forming machine the combination of a vertically movable open top and bottom mold, independently movable beveling plates adapted to be projected and retracted below the

mold walls, lever mechanism mounted on opposite terminals of the mold for moving said plates inwardly and outwardly, a shaft for each of said mechanisms having a shifting dog, a laterally movable hopper for filling the mold, and an abutment on the hopper engageable with the shifting dog.

4. In a block forming machine the combination of a vertically movable open top and bottom mold, independently movable beveling plates adapted to be projected and retracted below the mold walls, lever mechanism mounted on opposite terminals of the mold for moving said plates inwardly and outwardly, a shaft for each of said mechanisms having a shifting dog, a laterally movable hopper for filling the mold, an abutment on the hopper engageable with the shifting dog, and a laterally movable resisting stripper head adapted to register with the molded block within the mold.

5. In a block forming machine the combination of a vertically movable open top and bottom mold having parallel side walls and inwardly sloping end walls provided with clearance openings, independently movable beveling plates adapted to be projected and retracted below the side walls and through the clearance openings of the end walls, lever mechanism mounted on opposite terminals of the mold for moving said plates inwardly and outwardly, a shaft for each of said mechanisms having a shifting dog, a laterally movable hopper for filling the mold, and an abutment on the hopper engageable with the shifting dog.

6. The combination with a vertically movable open top and bottom block forming mold having a relatively movable forming plate carried by the mold, of a laterally movable resisting stripper head adapted to register with the molded block within the mold to effect discharge of the block when the mold is elevated.

7. In a block forming machine, the combination of a vertically movable open top and bottom mold, an independently movable beveling plate adapted to be projected and retracted below one side wall of the mold, lever mechanism mounted on opposite ends of the mold for moving the plate inwardly and outwardly, a shaft for each of said mechanisms having a shifting dog, a laterally movable hopper for filling the mold, and an abutment on the hopper engageable with the shifting dog.

8. The combination with a vertically movable open top and bottom block forming mold and a laterally movable feed hopper, of a relatively movable forming plate carried by the movable mold operable across the plane of movement of the mold, and means actuated by the feed hopper for moving the forming plate.

9. The combination with a vertically movable open top and bottom block forming mold and a laterally movable feed hopper, of a horizontally movable forming plate carried by the movable mold, means on the mold for moving the forming plate inwardly and outwardly, and means on the feed hopper for actuating said means.

10. The combination with a vertically movable open top and bottom block forming mold and a laterally movable feed hopper, of a relatively movable forming plate extendible inwardly partway of the open area of the mold across the plane of the movement of the mold and movable with the mold upwardly and downwardly, actuating means for the forming plate on the mold, and a co-operating actuating element on the feed hopper.

11. The combination with a vertically movable open top and bottom block forming mold and a laterally movable feed hopper, of a horizontally movable forming plate having a beveled forming face operatively mounted on and movable with the mold and across the plane of movement of the mold, and means on the mold actuated by the feed hopper, or moving the forming plate.

12. The combination with a vertically movable open top and bottom block forming mold and a laterally movable feed hopper, of a relatively movable forming plate carried by the movable mold operable across the plane of movement of the mold, and means actuated by the feed hopper for moving the forming plate inwardly and outwardly conformably with feed hopper movement.

13. The combination with a vertically movable open top and bottom block forming mold and a laterally movable feed hopper, of a pair of oppositely located inwardly and outwardly movable forming plates each having an upper inner beveled edge portion, said plates being mounted on and movable with the mold and across the plane of movement of the mold, and means on the mold actuated by the feed hopper for moving the forming plates.

14. The combination with a vertically movable open top and bottom block forming mold and a laterally movable feed hopper, of a pair of oppositely located horizontally arranged inwardly and outwardly movable forming plates each having an upper inner beveled edge portion, said plates being mounted on and movable with the mold and across the plane of movement of the mold, lever mechanism on each end of the mold connected with the ends of the plates and provided with terminal dogs, and abutments carried by the feed hopper adapted to engage said dogs.

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