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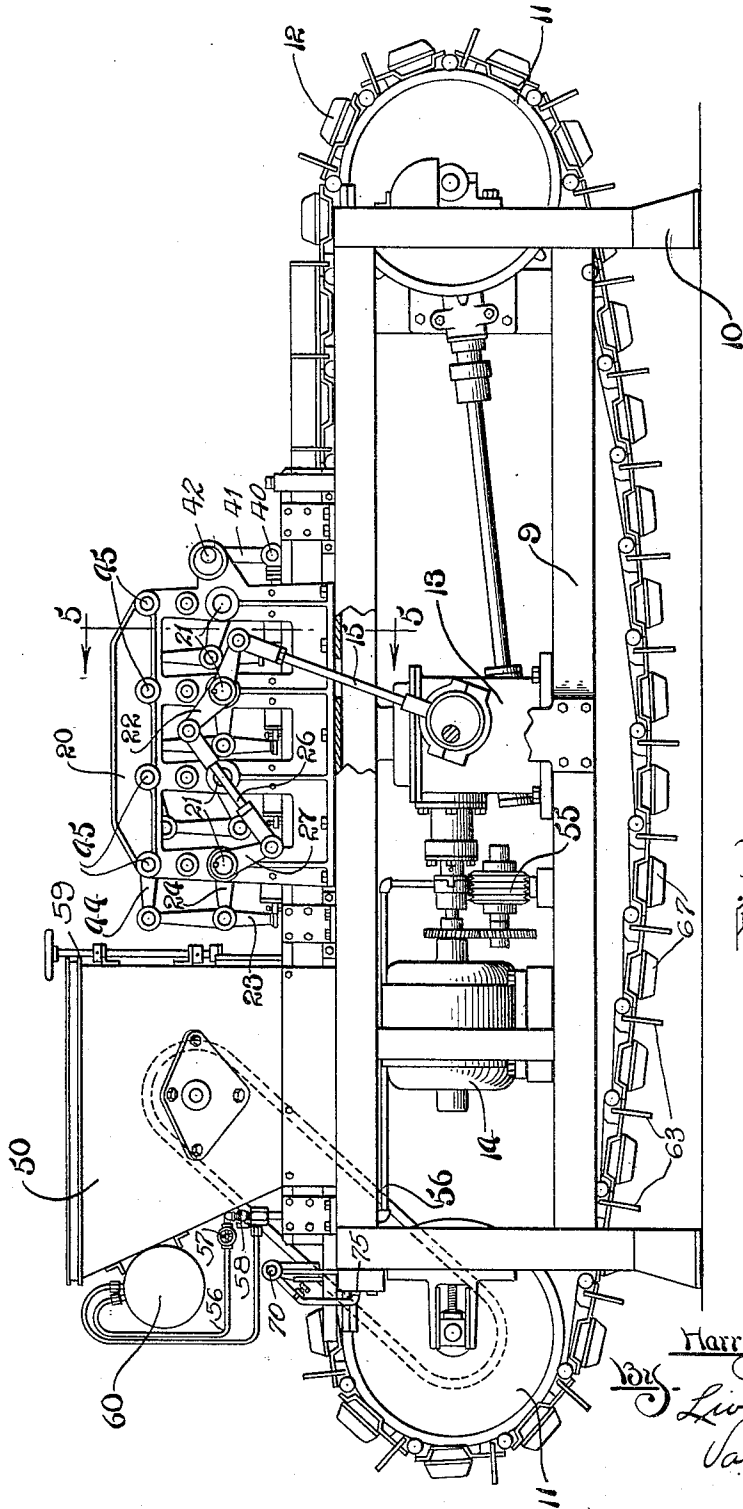
H. E. DUNN

1,908,640

BRICK MACHINE

Filed Aug. 25, 1930

3 Sheets-Sheet 1



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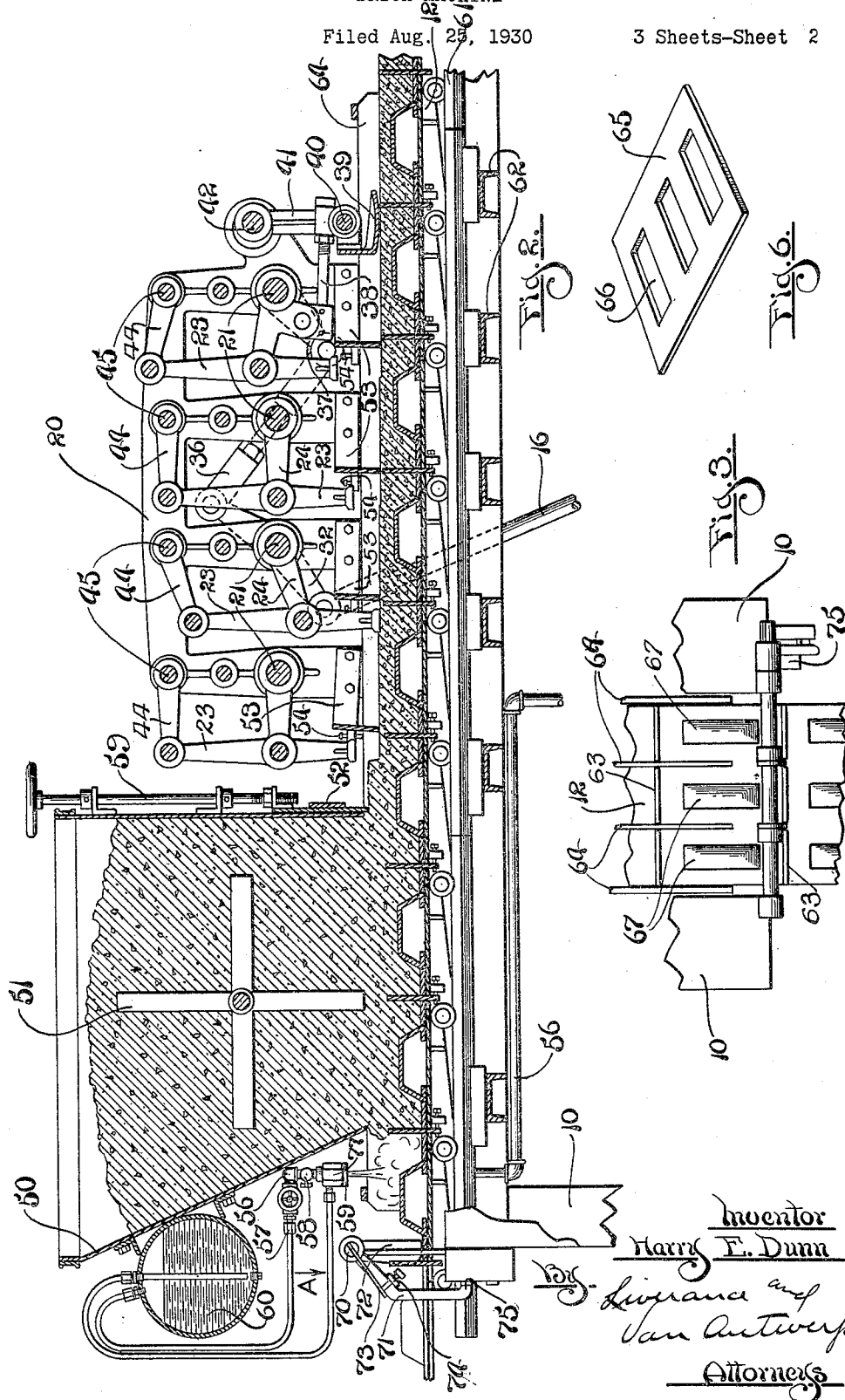
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3 Sheets-Sheet 2



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3 Sheets-Sheet 3

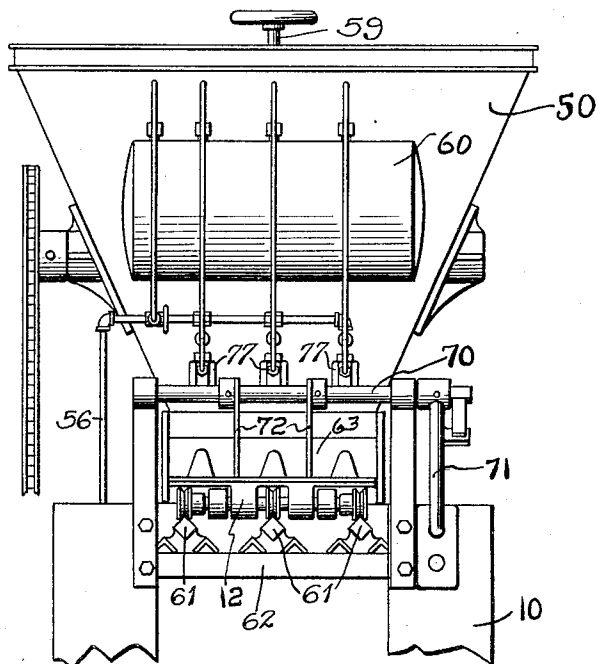


Fig. 4.

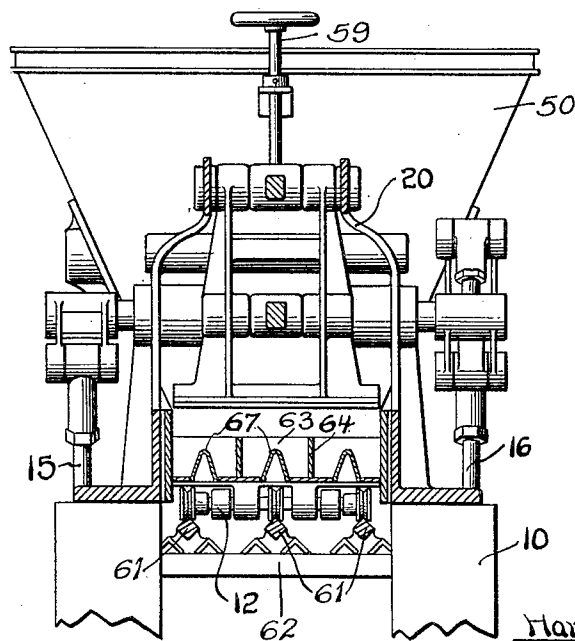


Fig. 5.

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UNITED STATES PATENT OFFICE

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BRICK MACHINE

Application filed August 25, 1930. Serial No. 477,522.

This machine relates to a line production machine and is more particularly directed to a brick forming machine.

Many difficulties have been encountered in the past in machines of this character in that the blocks formed would be irregular in shape, hard to remove from the carrying means and the machines themselves have been rather slow in operation and more or less inefficient.

One of the aims of my invention is to produce a machine which is efficient in operation in that it forms blocks which are all of the same size and shape and moreover these blocks are of substantially the same weight with one another whereby each will have exactly the same characteristics. Thus a uniform product is had.

Another object is to provide means which will prevent the cementitious mixture from adhering to the molds. Also, the molds are formed of stationary parts acting in conjunction with certain movable parts of the endless chain and such a construction makes for easy removal of the blocks from the chain.

Further objects, and objects pertaining to the details and economics of construction and operation of my invention, will definitely appear from the detailed description to follow.

Referring to the drawings:—

Fig. 1 represents a side view of my machine, certain parts being broken away.

Fig. 2 represents a longitudinal cross section of Fig. 1.

Fig. 3 is a plan view illustrating the construction of the automatic stopping means, looking in the direction of arrow A, of Fig. 2.

Fig. 4 is a rear view of the machine, and

Fig. 5 is a view taken on the plane of line 5—5 of Fig. 1.

Fig. 6 is a perspective view of one of the bottom plates.

Similar numerals refer to similar parts throughout the several views.

The main supporting frame 10, having revolvably mounted sprocket wheels 11 at either end thereof, around which an endless chain or carrier 12 travels, has a lower framework 9 which supports gearing 13 adapted to be driven by the prime mover 14 and in turn this

gearing drives one of the sprocket wheels 11 and also reciprocates the two eccentric rods 15 and 16.

A smaller or supplemental frame 20 is mounted upon the main frame 10, and a set of horizontal cross shafts 21 are revolvably mounted therein. The two middle cross shafts extend outwardly beyond the frame 20 and, as shown in Fig. 1, one of these shafts has a rocker arm 22 fixed therewith, one end of this rocker arm being pivotally connected to the eccentric rod 15 and the other end being connected to the adjustable length link 26, this link 26 being pivoted on the crank arm 27 which is rigid with the end cross shaft 21. Both of these shafts 21 have arms rigid therewith and tamping or ramming elements 23 are pivotally connected on these arms.

Referring now to Fig. 2, the opposite eccentric rod 16 reciprocates a rocker arm 32, which is rigid with the other center shaft 21, and another adjustable link 36 transmits the motion from the other end of the rocker arm 32 to a crank arm 37 which is rigid with the end shaft 21. The crank arm 37 also has a pitman 38 pivoted thereto and this pitman is connected to an arm 41 to rock the same about its eccentric center 42. A plate 39, which is adapted to trowel the upper surface of the blocks as they are leaving the machine, is pivoted at 40 to the arm 41, thus allowing for suitable adjustment when desired.

The upper frame 20 has an upper set of shafts 45 which pivotally support the arms 44, these arms being connected to the tamping elements 23.

From the construction just described it will be seen that the prime mover will not only actuate the endless chain but it will also move the four tamping elements up and down in timed relationship with each other. The several tamping elements are so adjusted as to tamp the cementitious mixture to the proper level and after the mixture has been tamped to substantially the correct depth the smoothing or trowelling plate 39 is oscillated thereover thus producing the smooth and even finish desired.

A hopper 50 is provided with an agitator 51, as shown in Figs. 1 and 2, and openings

near the bottom thereof provide for the passage of the chain or carrier. An adjusting plate 52 is slidably mounted on the hopper by means of the threaded stem and hand wheel 59 and limits the amount of cement mixture or other plastic which flows or is drawn out of the hopper.

Scrapers or leveling plates 53 are adjustably mounted by means of studs 54 to the proper height, and such devices are interposed between each set of tamping elements.

An air pump 55, see Fig. 1, is driven in any desired manner and furnishes air under pressure upwardly through the pipe 56; through the valve 57 into the upper part of the oil reservoir or tank 60 thus forcing the oil out of the tank down through the spray nozzle 77. A valve 58 is also provided leading from the pipe 56 to furnish air under pressure to the spray nozzle. Thus, by suitable regulation of the several valves, a finely divided spray of oil may be shot downwardly against the recesses of boxes of the revolving chain.

The upper section of the chain 12 runs on members 61, as clearly shown in Figs. 2 and 5, these members being supported by cross channels 62. Spacer plates 63 are fixed crosswise in the chain and are permanently attached thereto, these plates being notched to allow for the entry of the long plate members 64, these latter plate members being stationary and fixed to one of the frame members. As shown in Fig. 5, the top edges of the plates 64 are flush with the tops of the spacer plates. The bottom of the recesses are adapted to be closed by removable plates 65, see Fig. 6, having openings 66 therein which fit over the hollow shells 67, these shells traveling with the chain. These plates are adapted to be placed into the chain before it starts under the oil spray and are adapted to be lifted out of the chain after the blocks have passed through all of the series of formation and operation.

A cross shaft 70 is pivoted on the main frame above the chain and has a rigid arm 72 depending therefrom and another arm 71 pivoted thereon which extends therefrom as shown in Fig. 2, the lower end of this last mentioned arm being adapted to contact with the electric control button 75. A spring 73, rigid with the shaft 70 presses against a set screw 74, adjustable on the arm 71, and movement of the rigid arm 72 in an anti-clockwise direction will cause the spring to become flexed and the arm 71 to actuate the control button 75. Such a movement will stop the operation of the machine by shutting off the electric power and would be caused by having a bottom plate 65 improperly placed in the chain whereby portions thereof extend too high and contact with the arm 72. Thus the forming of imperfect bricks is prevented.

The operation is readily understood. The motor drives the endless chain, the tamping elements, the smoothing device, the agitator for the hopper and the small air motor 55. The tank containing the oil or liquid is under pressure and hence a fine spray shoots downwardly upon the inside of the molds, the bottom or removable plates 65 being properly inserted therein. As the molds travel under the hopper they become filled with plastic mixture to the proper height. It should be noted that the longitudinal side and center plates 64 pass into the slots in the cross spacers and hence three blocks are formed side by side. As the chain and its molds travel through the machine the tamping elements and the scrapers alternately act upon the top surface thereof until the surface is flush with the top of the cross plates. Next, the smoothing device surfaces the tops of the blocks, after which the longitudinal stationary cross boxes 64 are drawn from between the blocks due to the movement of the chain and last of all the blocks are lifted from the machine.

One of the main features of my machine lies in the tamping means. These tamping elements do not descend straight downwardly but due to their novel mounting means tamp at an acute angle to the direction of motion of the carrying device. This movement is obtained by mounting the tampers proper upon arms of suitable length, these arms being pivoted on shafts 21. By adjusting the heights of these pivot shafts or by changing the lengths of the several links 24 and 44, or by both, I may obtain proper and efficient tamping. It is to be noted that the direction of tamping is at such an angle as to have a slight component of force along the chain or carrier in the direction which it is moving and hence the progress of the chain is expedited through the machine. Of more importance, however, is the fact that such tamping tends to act in really a vertical direction and hence compress the mixture better, all voids being removed therefrom.

All of the tamping elements are similarly mounted on the upper frame but the mixture upon which they act gradually lowers as it travels through the machine and thus the strokes of the tamping elements gradually change from powerful straight downwardly directed ones to less direct ones, the last tamping means giving not only a packing or tamping force but also a side or rolling force or movement which further crowds down and packs the material and prepares it for the final smoothing and finishing action under the trowel member 39.

While I have described a complete embodiment of my invention I do not wish to be limited to the particular construction shown, my invention being in fact limited solely by the attached claims.

I claim:

1. In a device of the character described having a hopper containing a plastic mixture, an endless conveyor adapted to pass under the hopper, said conveyor having recesses therein, removable bottom plates for said recesses, means to drive said endless conveyor, control means for said driving means and additional means adapted to be actuated by improper placing of any of the bottom plates to operate the said control means.

2. A molding machine comprising a frame, sprockets revolubly mounted thereon, and endless carrying chain cooperably associated with the sprockets, means for actuating one of the sprockets, a hopper adapted to contain a cementitious mixture, means for mounting the hopper above the chain whereby its contents may gravitate into the chain, a supplemental frame mounted above the chain, revolubly mounted shafts therein, tamping elements driven by the shafts and means for oscillating the shafts.

3. A molding machine as set forth in claim 2 including spacing plates, means for mounting said spacing plates on the rigid frames in parallelism to the direction of travel of the chain and extending down into said chain.

4. A block molding machine comprising a feeding hopper having an opening therein, a carrying device adapted to be fed from said hopper, a plurality of tamping means adapted to act upon the material which is fed into the carrying device and scraping means between the tamping means.

5. In a molding machine comprising a hopper adapted to receive a cementitious mixture and carrying means adapted to be fed therefrom the combination of a plurality of tamping means adapted to act one after the other upon the mixture and a plurality of scraping means adapted to act continuously upon the mixture.

6. A machine comprising the elements in combination of claim 5 and also having a trowel element operating upon the mixture.

7. A line production machine for manufacturing blocks or the like comprising a hopper containing cementitious material, said hopper having an opening thereunder, an endless chain adapted to pass through said opening, means to operate the chain, slidable plate means on said hopper adapted to limit the size of the opening on the side at which the chain leaves the hopper, a plurality of spaced tamping elements adapted to act upon the material, a plurality of scraping elements between the several tamping elements and means to intermittently operate the said tamping elements.

8. A troweling device comprising a support, a curved plate of arcuate cross section and means to mount the plate to swing eccentrically upon the support.

9. In a brick or block forming machine of

the type described, a moving conveyor having recesses therein, said recesses being adapted to receive a plastic mixture therein, removable bottom plates for said recesses, and means actuated by improper placing of any of said bottom plates to prevent movement of said conveyor.

10. In a molding machine adapted to receive plastic material therein, the combination of tamping mechanism therefor including two fixed pivots located one above the other, arms mounted upon said pivots and extending laterally therefrom, a tamping element pivotally connected to both of said arms and means for moving said tamping element.

11. In a molding machine having a moving horizontal conveyor with recesses therein for receiving a plastic material the combination of a plurality of scraper means adapted to act upon the plastic material, said scraper means being positioned correspondingly lower along the conveyor in the direction in which it is moving and tamping means between the plurality of scraper blades.

12. In a brick or block forming machine of the type described, a moving conveyor having recesses therein, said recesses being adapted to receive a plastic mixture, a plurality of tamping members located above said conveyor and adapted to successively operate upon the material in the conveyor in the direction of its travel, the lowermost tamping position of each tamper being lower than the corresponding position of the preceding tamper in the direction of movement of the conveyor.

13. The elements in combination defined by claim 12, combined with a plurality of scraping members adapted to act upon the material in said conveyor, each of said scraping members being located in a position following a respective tamping member and each scraping member having its scraping edge positioned lower than the preceding scraping member in the direction of movement of the conveyor, for the purpose described.

In testimony whereof I affix my signature.

HARRY E. DUNN.

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