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2,615,228

BUILDING BLOCK MACHINE

Filed Dec. 19, 1947

3 Sheets-Sheet 1

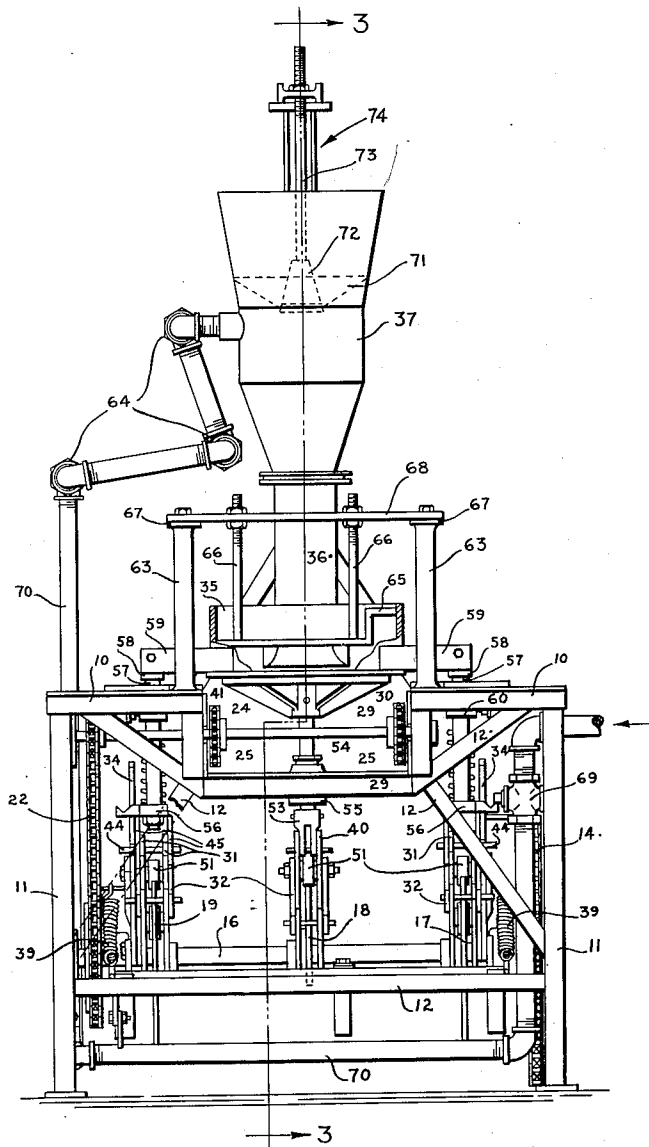


FIG. 1

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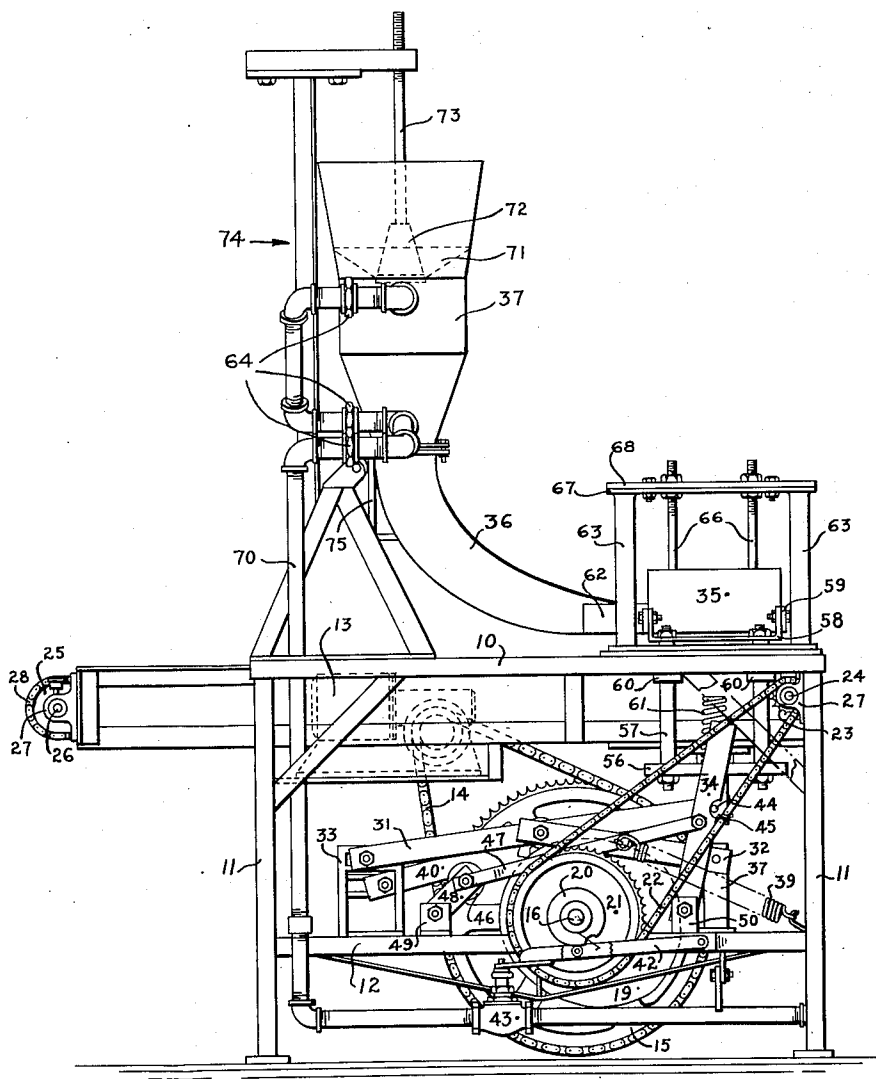


Fig. 2.

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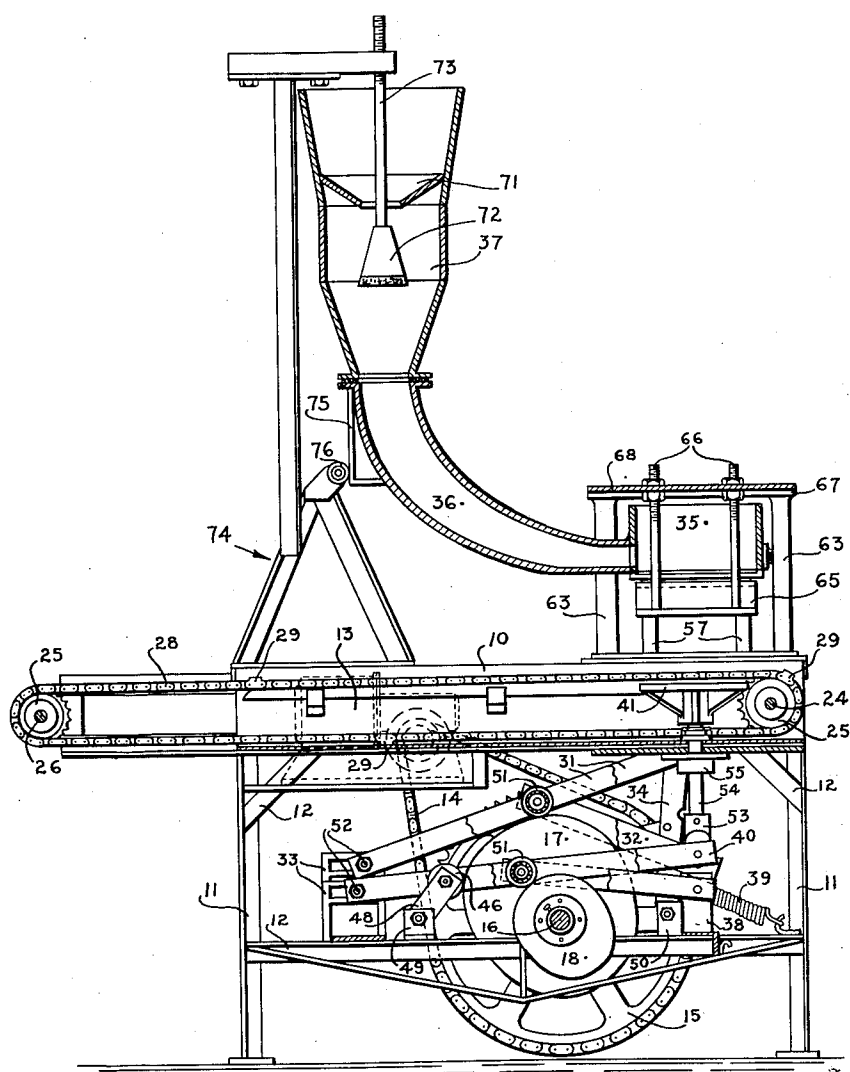


FIG. 3.

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BUILDING BLOCK MACHINE

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4 Claims. (Cl. 25—41)

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This invention relates to new and useful improvements in cement block making machine.

Although cement block making machines are not new in the art certain advantages have been devised herein which are believed improvements in this art.

Briefly this machine adopts an entirely different principle for producing cement blocks. Whereas other well known types of machines adopt the vibration principle in the mold, depending on several motors for operation, this invention requires a single motor coupled with a speed reducer which operates the entire cycle on the extrusion principle using air as a medium to force the cement under high pressure from the hopper into a mold.

By this method of molding cement blocks porosity is eliminated, and a fine density and uniformity is obtained which naturally increases the strength of cement blocks to a maximum making them impervious to water and condensation.

These are two factors which are detrimental to blocks produced by the vibratory system.

The primary object of the invention is therefore to provide a cement block making machine of the extrusion type.

A further object is that the results present cement blocks which are opposed to water penetration and condensation. A still further object is the uniformity and density of the blocks obtained.

Other apparent objects are in the compact structure, simple mechanical action, ease of operation, efficient machine of the character set forth and the comparatively low manufacturing cost.

With these and other objects that may appear while the description proceeds, the invention consists in the novel arrangement of cooperating parts as hereinafter more specifically set forth, claimed and shown in the accompanying drawings forming part of this application and in which:

Fig. 1 is a front elevation view of the machine;

Fig. 2 is a side view thereof partly in section showing some of the elements comprising the machine;

Fig. 3 is a sectional side elevation taken on line 3—3 of Figure 1.

Referring more in detail to the drawings in which similar reference characters designate corresponding parts throughout the several views it will be seen the invention consists of a frame work 10 mounted on supporting members 11 and reinforced by braces 12. The speed reducer 13 drives sprocket 15 through chain 14 and revolves main drive shaft 16 which is mounted in roller bearings and secured to braces 12 of frame work 10. Rotated and secured by suitable means to drive shaft 16 are four cams 17, 18, 19, 20; cams

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17 and 19 are identical in shape and actuate levers 31 in raising and lowering of outer mould 35, extension tube 36 and hopper 37. Cam 18 is secured on shaft 16 in opposite position to cams 17 and 19 and actuates lever 40 in lowering and raising of platen 41. Cam 20 on shaft 16 actuates lever 42 and controls air valve 43. A sprocket 21 is also secured to drive shaft 16 and rotates by means of link chain 22 and a sprocket 23 fastened to conveyor chain shaft 24. Both ends of shaft 24 are mounted in ball bearing cases 27 secured to frame work 10 at front of machine. At rear of machine and fitted to frame work 10 are two similar ball bearing cases 27 in which is mounted shaft 26. Mounted and secured to conveyor shafts 24 and 26 are four identical sprockets 25 connected by two link chains 28. Fixed to chains 28 are six dogs 29, three being equidistantly spaced on each chain 28 and travel parallel to one another when machine is in operation. The dogs serve the purpose of automatically conveying pallets 30 to front of machine for moulding operation.

Referring now to the assembly of outer mould 35 which has a U-shaped tray 62 to which is secured the discharge end of extrusion tube 36 through which cement is forced through port in back wall of mold 35. Four extension arms 59 are welded to front and back of mold 35 and are attached to angle plates 58 by means of bolts and nuts. To each angle plate 58 are attached two perpendicular shafts 57 connected together at their lower ends by a plate 56. Resting on plate 56 is a spring 61 to speed up the return of mold 35 to the platen. Attached to the frame work 10 and enclosing shafts 57 are four greasing flanges 60.

The construction of levers 31 and 40 are identical, each having a roller bearing 51 in center of lever and another at rear end of lever being enclosed by frame 33. Tie rods 32 are flanked on either side of levers and are secured on axles of roller bearing 51. Front end of tie rods 32 are pinned to uprights welded to brace 12. Levers 31 and 40 are secured by pins 44 at front end to hangers 45 which are welded to plate 56. A locking device is provided in notched arm 54 being held in position by spring 39. A roller 46 fixed jointly to plates 48 and anchor angle 49 actuates locking and unlocking position by contact with cams 17 and 19. Spring 39 is attached to hook on brace 12 and a similar hook on follow through rod 47, follow through rod 47 being attached to roller bearing 46 and notched arm 34 by means of a nut and bolt. The front end of lever 40 which controls the raising and lowering of platen 41 is secured to yoke 53 by a bolt. A shaft 54 passes through bottom of frame work 10 and flange 55 fixed to underside of frame work 10. Four pillars 63 secured to top of frame work

10 having transverse bars 67 and top plate form support for die 65 which is held in place by four threaded rods 66 each rod having two nuts to enable locking of die 65 to any desired cement block thickness.

Support for extension tube 36 and valve 72 is shown generally at 74 and secured to the top of frame 10. Roller 76 bears weight of extension tube 36 on perpendicular angle 75 attached to top of extension tube 36. Hopper 37 is attached to extension tube 36.

In operation, the mixed cement is poured from a cement mixer located on a raised platform above the hopper 37. The pallets 30 are conveyed from the rear of the machine by the conveyor chains 28 to a position beneath the mould box 35 and upon raising the platen 41 the pallet is forced against the bottom of the mould box and the mould is ready to receive cement. Upon opening of air valve 43, air pressure through pipe 70 enters the upper end of extension tube 36 forcing cement from the tube into the mould. When this action is completed the mould box is raised stripping the mould block clean and the platen is lowered which lowers the block onto the conveyor chain which carried it to the operator at the forward end of the machine.

The machine is driven by a motor connected through a speed reducing gear mechanism 13 to a drive sprocket 15 mounted on shaft 16. Mounted on the shaft 16 are four cams 17, 18, 19 and 20. Also mounted on shaft 16 is a sprocket 21 which through chain 22 and sprocket 23 drives the conveyor chains 28. Cams 17 and 19 are identical in shape and operate to raise and lower levers 31 which actuate the mould box 35. The levers 31 are locked in lowered position by pins 44 which engage notches in arms 34, the notched arms being normally held in engagement with the pins 44 by springs 39 which exert a forward movement on rod 47 connected to arm 34. The rod 47 is retracted to release arm 34 when roller 46 is engaged by the cam thus permitting the levers 31 to raise the mould box. Thus, it is seen the mould box is locked in its lower position when the air pressure is released by opening valve 43 which is actuated by cam 20.

The platen 41 is raised and lowered by lever 40 which is actuated by cam 18. The raising of platen 41 forces the pallet against the bottom of the mould box 35. As the extension tube 36 is connected to the back wall of the mould box, the tube and hopper 37 are raised and lowered with the mould box and universal joint 64 in the pipe line 70 permit limited movement of the hopper. The cement valve 72 which opens and closes the mouth 71 of the hopper is stationary and when the hopper is lowered the valve closes and when it is raised the valve opens. Thus, the air pressure in the tube 36 will tend to tightly close the valve when the cement in tube 36 is extruded into the mould box.

It is believed that the construction and advantages of the invention may be apparent from the foregoing paragraphs taken in conjunction with the accompanying drawings without further detailed description.

While the preferred embodiment of the invention has been disclosed it is understood that minor changes in the construction and arrangement of cooperating elements may be resorted to within the scope of what is claimed without departing from the spirit of the invention.

I claim:

1. A cement block making machine comprising a supporting frame, a fixed die member supported on said frame, a mould box surrounding said die member mounted on said frame for vertical reciprocative movement, said die member closing the upper end of said box when the latter is in a lowered position and adapted to project from the bottom of the box when the latter is in a raised position, means for raising and lowering said mould box, a platen mounted beneath said die member for vertical movement, means for raising said platen to close the bottom of said box when the latter is lowered, a cement hopper having a mouth at its upper end and its lower end connected to said box, means mounting said hopper for vertical movement with said box and means for introducing air under pressure into said hopper for ejecting cement from the hopper into the mould box between said die member and said platen.

2. A machine of the character described in claim 1 including means for locking said mould box in its lowered position.

3. A machine of the character described in claim 1 including a valve for closing the mouth of said hopper when said mould box is lowered.

4. A machine of the character described comprising a supporting frame, a fixed die member mounted on said frame, a mould box surrounding said die member mounted on said frame for vertical reciprocative movement, said die member closing the upper end of said box when the latter is in a lowered position and adapted to project from the bottom of the box when the latter is in a raised position, means for raising and lowering said mould box, locking means for holding said box in its lowered position, a cement hopper having a mouth at its upper end and a discharge spout connected to a wall of said box, means for mounting said hopper for vertical movement with said box, a valve in the mouth of said hopper for closing the same when the mould box is lowered, a platen mounted in vertical alignment with said die member and mould box, means for raising said platen to close the bottom of said box when said box is lowered, and means for introducing air under pressure into the discharge spout of said hopper to extrude the cement in said spout into said mould box between the die member and platen.

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