May 3, 1960 H. E. WILSON 2,934,808

MACHINE FOR PRODUCING BUILDING BLOCKS

Filed May 9, 1956 6 Sheets-Sheet 1

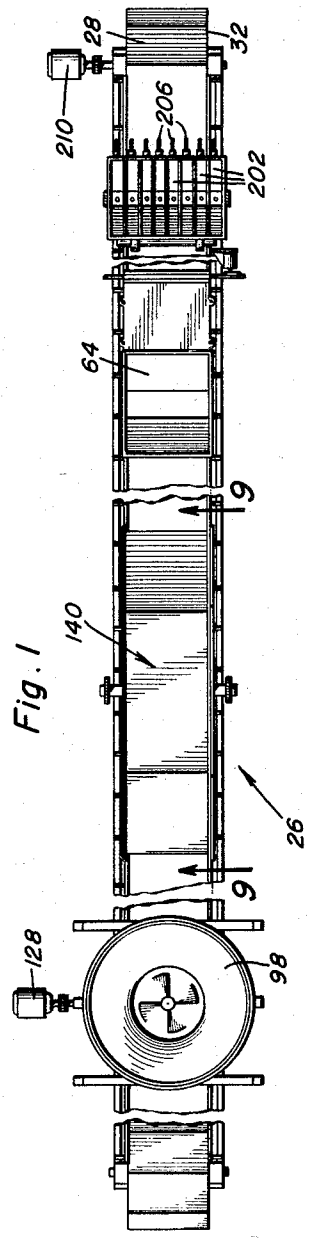


Fig. 1

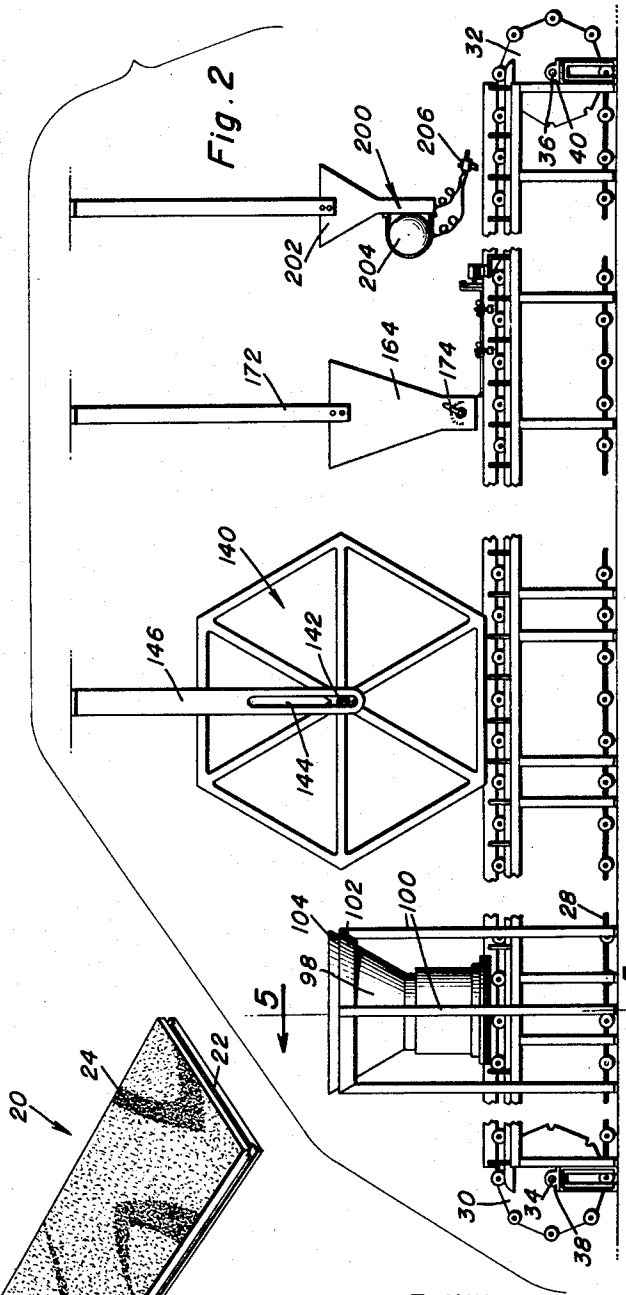


Fig. 2

Fig. 14

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MACHINE FOR PRODUCING BUILDING BLOCKS

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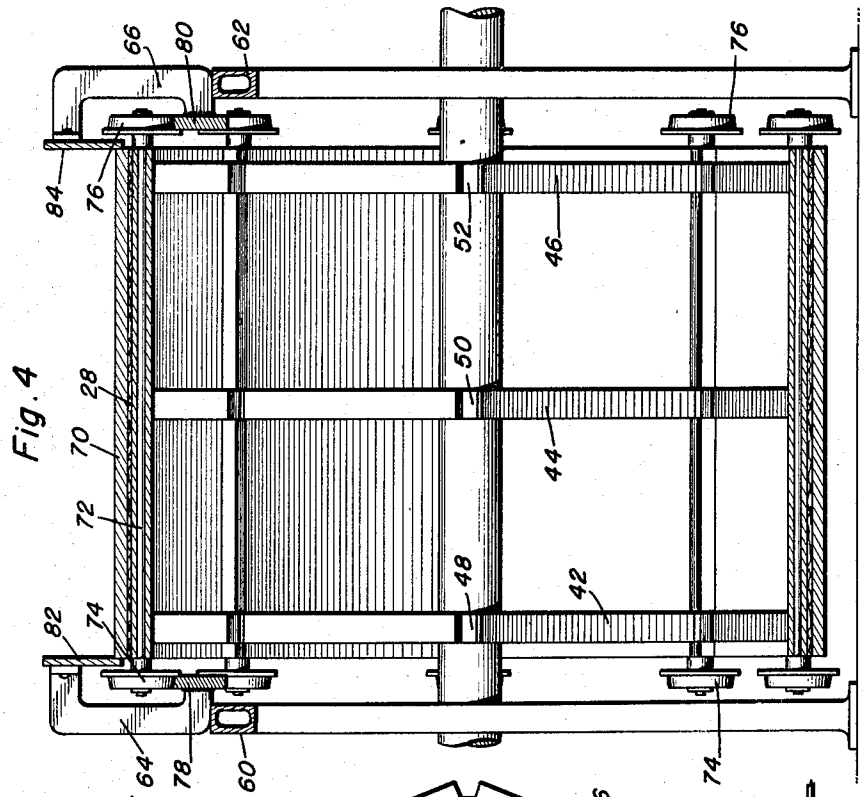


Fig. 4

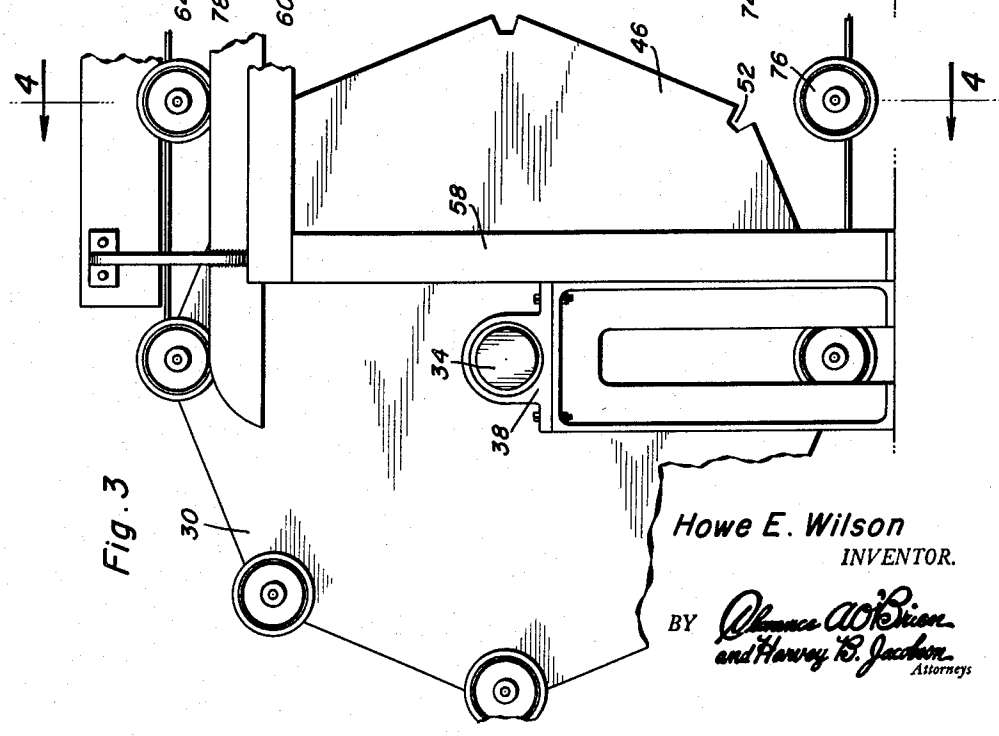


Fig. 3

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MACHINE FOR PRODUCING BUILDING BLOCKS

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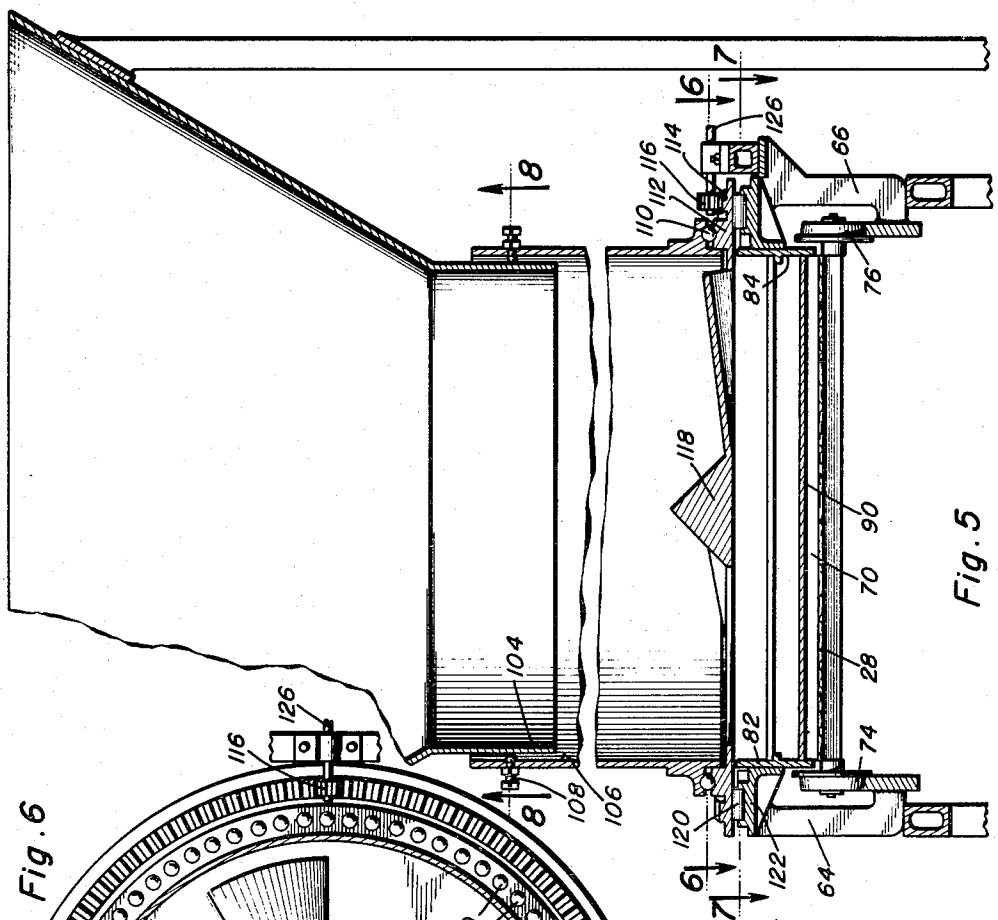


Fig. 5

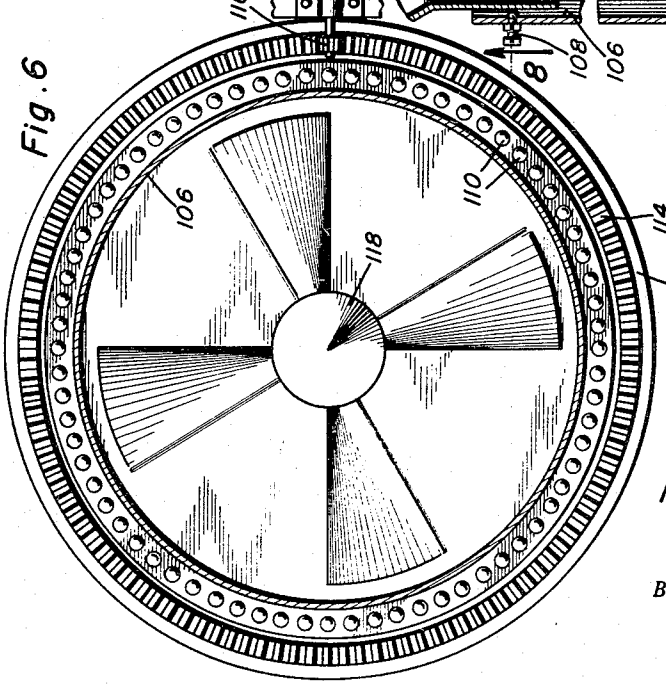


Fig. 6

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MACHINE FOR PRODUCING BUILDING BLOCKS

Filed May 9, 1956 6 Sheets-Sheet 4

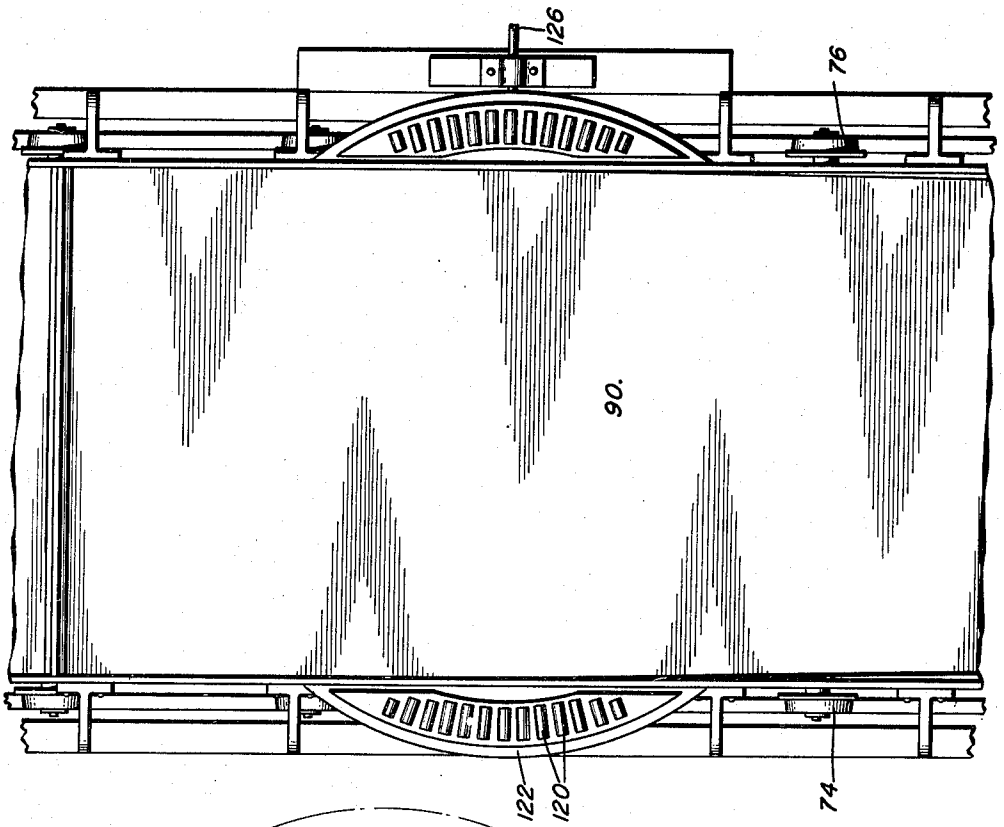


Fig. 7

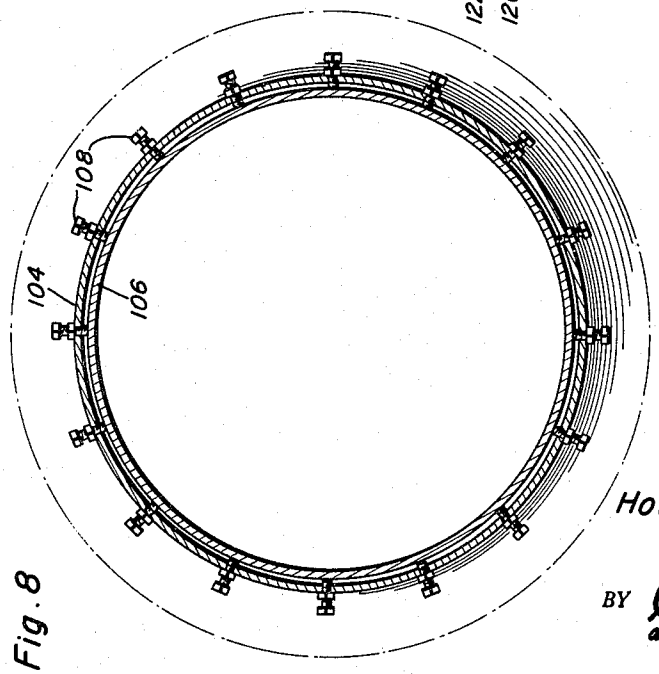


Fig. 8

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MACHINE FOR PRODUCING BUILDING BLOCKS

Filed May 9, 1956 6 Sheets-Sheet 5

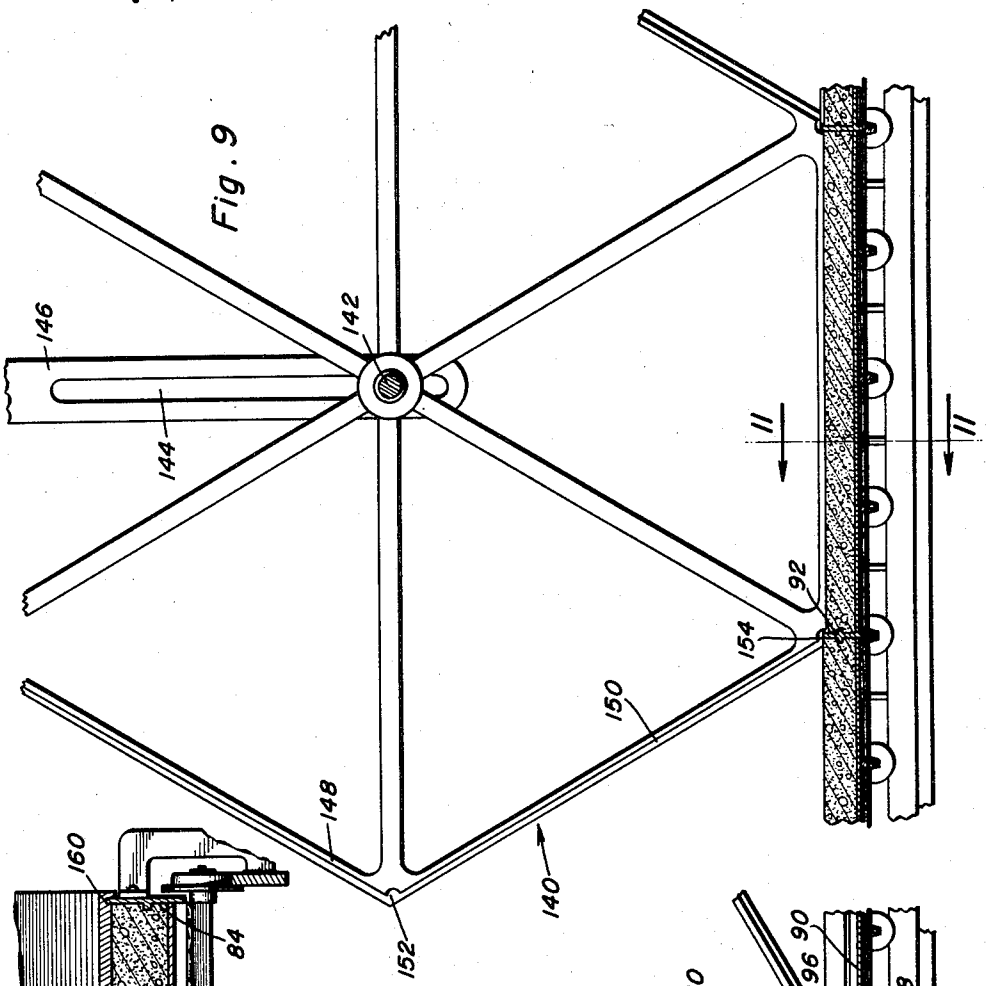


Fig. 9

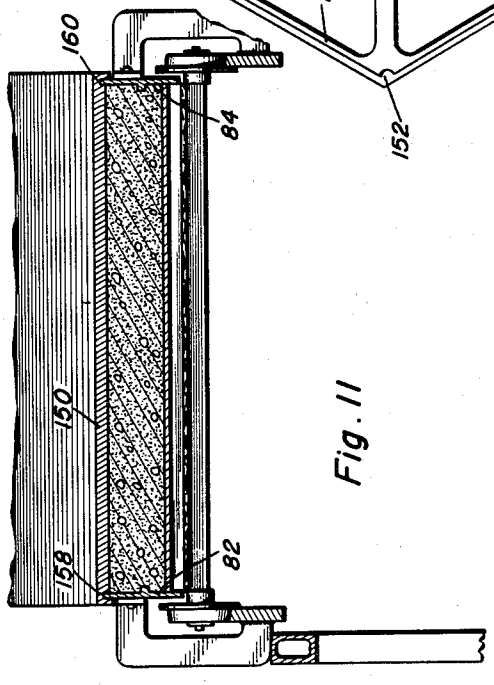


Fig. 11

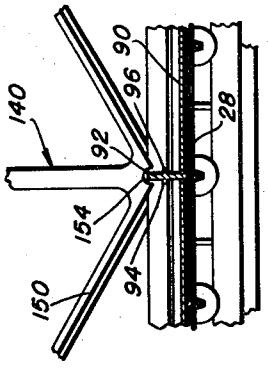


Fig. 10

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MACHINE FOR PRODUCING BUILDING BLOCKS

Filed May 9, 1956 6 Sheets-Sheet 6

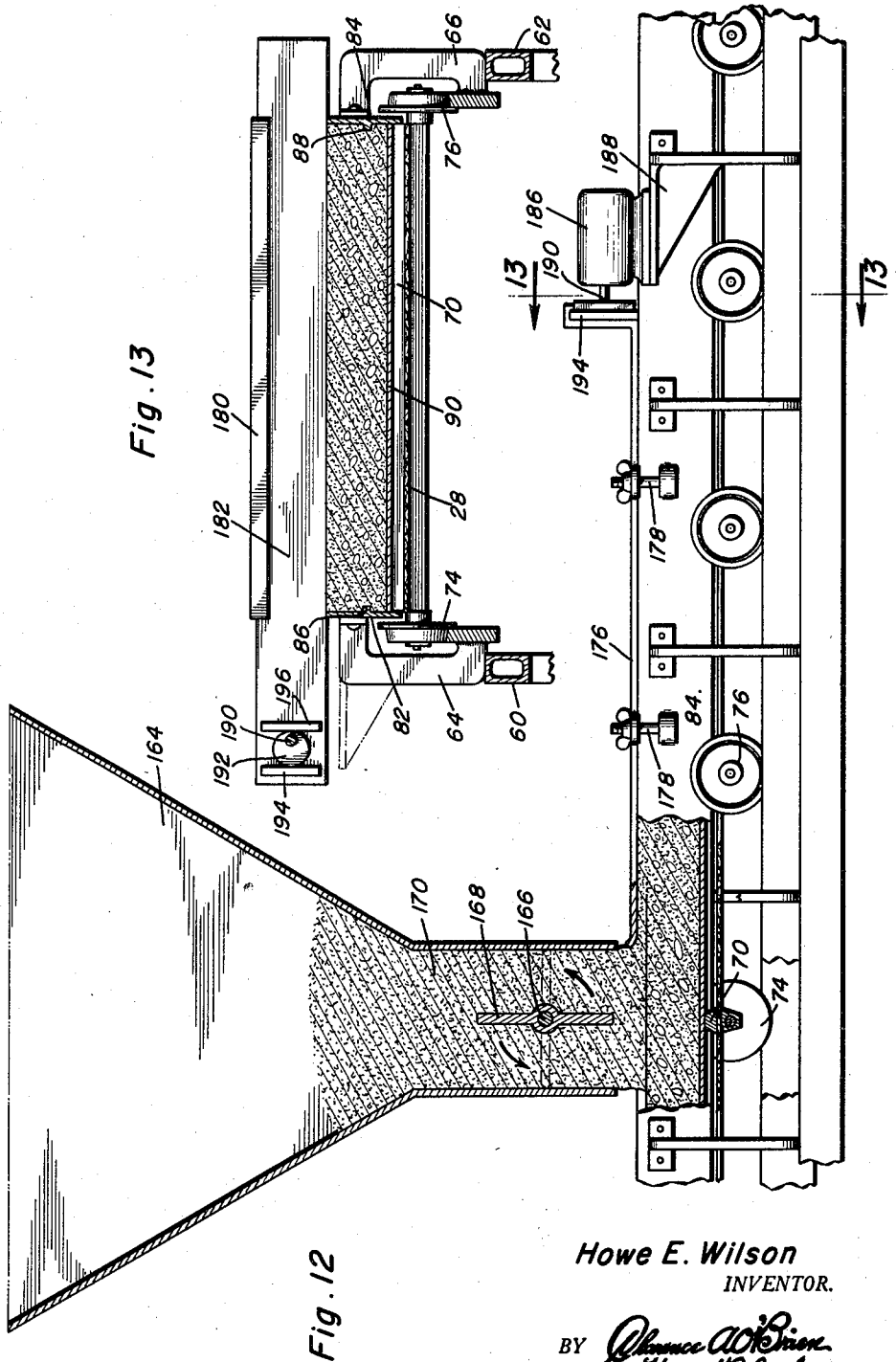


Fig. 13

Fig. 12

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United States Patent Office 2,934,808 Patented May 3, 1960

2,934,808

MACHINE FOR PRODUCING BUILDING BLOCKS

Howe E. Wilson, Calumet City, Ill.

Application May 9, 1956, Serial No. 583,822

1 Claim. (Cl. 25—99)

This invention relates to an apparatus for producing building blocks especially those of the type disclosed in the United States patent to Howe E. Wilson, No. 2,676,482, for Wall of Reinforced Spaced Building Blocks.

The primary object of the present invention resides in the provision of a machine for producing building blocks which is especially rapid in operation and capable of being used to manufacture a large number of building blocks in a minimum period of time.

The construction of this invention features an endless belt conveyor having means carried by the conveyor for receiving mix from a hopper and for performing operations thereon to obtain building blocks having a highly attractive exterior configuration. Utilized in the invention is means for tamping the mix to a suitable level for reception of a suitable facing thereon and further includes means for applying colored powder onto the finishing material so as to color the building blocks in any manner as may be desired.

Another object of the present invention resides in the provision of an apparatus for manufacturing building blocks which can provide suitable contours and configurations in the building blocks whereby suitable grooves are automatically formed in the finished block by the machine without requiring any waste of material.

Still another object of the invention resides in the provision of an apparatus for manufacturing building blocks which includes an endless belt on which platens may be readily placed and on which platens a mix may be positioned so that as soon as the mix is only partially set, the platens may be removed allowing the building block to complete its setting and curing even when disposed on the platens, after which the platens may be readily used and reused.

Still further objects and features of this invention reside in the provision of a machine for producing building blocks that is easy to operate, which is adapted for continuous use, and which is efficient in operation.

These, together with the various ancillary objects and features of the invention which will become apparent as the following description proceeds, are attained by this machine for producing building blocks, a preferred embodiment of which has been illustrated in the accompanying drawings, by way of example only, wherein:

Figure 1 is a plan view of the machine for producing building blocks with parts being broken away to allow the machine to be shown in a larger scale;

Figure 2 is a side elevational view of the machine with parts thereof being broken away to allow the machine to be shown in a larger scale for clarity;

Figure 3 is an enlarged partial and elevational view showing the manner in which the conveyor may be entrained on one of the end wheels utilized in the invention;

Figure 4 is an enlarged vertical sectional view as taken along the plane of line 4—4 in Figure 3 further illustrating the mounting arrangement for the conveyor;

Figure 5 is an enlarged sectional detail view as taken along the plane of line 5—5 in Figure 2 illustrating the hopper for use in delivering mix to the platens;

Figure 6 is a horizontal sectional view showing in an enlarged scale details of the construction of the hopper;

Figure 7 is an enlarged sectional detail view as taken

along the plane of line 7—7 in Figure 5 further illustrating the construction of the hopper;

Figure 8 is an enlarged sectional detail view as taken along the plane of line 8—8 in Figure 5 illustrating the adjusting means for use in positioning the hopper;

Figure 9 is an enlarged sectional detail view as taken along the plane of line 9—9 in Figure 1 illustrating details of the construction of the tamping means utilized in the invention;

Figure 10 is a partial detail view illustrating the manner in which movement of the belt causes the tamper to rotate;

Figure 11 is a sectional detail view in an enlarged scale as taken along the plane of line 11—11 in Figure 9;

Figure 12 is an enlarged sectional detail view illustrating the construction of the hopper for delivering finishing material and the means for leveling the finishing material;

Figure 13 is a sectional detail view in an enlarged scale as taken along the plane of line 13—13 of Figure 12 illustrating in particular the leveling means for the finishing material; and

Figure 14 is a perspective view of one of the blocks which can be produced in accordance with the invention.

With continuing reference to the accompanying drawings wherein like reference numerals designate similar parts throughout the various views, and with initial attention directed to Figure 14, reference numeral **20** generally designates one type of building unit or block which can be produced in accordance with the invention. This building unit **20** is a generally rectangular flat slab having a peripheral tongue as at **22** therein and having a suitably colored finished surface **24**. Various colors as may be desired may be utilized in the finishing of the surface **24**. Further, these colors may be modeled, marbled, or otherwise applied so as to enable a building of highly attractive appearance to be constructed utilizing these building blocks **20**. In order to produce the building blocks **20**, especially in a rapid and highly efficient manner the machine for producing blocks comprising the present invention and generally indicated by reference numeral **26** is utilized. This machine includes an endless belt **28** which is entrained about end wheel assemblies **30** and **32**.

Referring now more particularly to the detail views of the end wheel **30** as is shown in Figures 3 and 4, it will be noted that the end wheels **30** and **32** are mounted on shafts **34** and **36** respectively which are journaled in bearing blocks **38** and **40**. Each of the wheel assemblies **30** and **32** includes three disks **42**, **44**, and **46** each of which is provided with a series of annularly spaced notches **48**, **50** and **52** therein.

The machine **26** further includes a suitable framework **58** of desired construction which includes longitudinal members **60** and **62** which support guide rails **64** and **66**.

The endless belt conveyor **28** has a plurality of spaced ribs **70** extending from the opposite surfaces thereof in which axles **72** are positioned which axles carry rollers or wheels **74** and **76** engageable on the rail elements **78** and **80** forming portions of the generally C-shaped guide rails **64** and **66**. The guide rails **64** and **66** carry guide plates **82** and **84** which as can be seen best in Figure 13 may be provided with ribs or tongues **86** and **88** thereon for forming grooves in the mix deposited on the series of platens **90** which are placed on the conveyor belt **28** by any suitable means such as by hand or automatically.

Each of the platens rests on a plurality of ribs **70** and each includes a rear end wall **92** which is provided with opposing tongues **94** and **96** so that the peripheral groove **22** can be formed in the building block during the initial stages of setting thereof thus preventing the necessity of

cutting these grooves in the blocks and thus wasting material, as well as labor. The platens **90** are arranged in edge-to-edge abutting relationship and are adapted to pass beneath the hopper **98**. This hopper **98** is preferably mounted on supports **100** which carry a supporting ring **102** engageable with the conical surface **104** of the extension portion of the hopper. This extension portion may be adjustably detachably secured in place to the main portion **106** of the hopper by a plurality of set-screws **108** which clampingly engage the main portion **106** of the hopper.

Referring more particularly to Figures 1 and 5 through 8 of the drawings, it will be seen that the main portion of the hopper is supported against rotation and rests on bearings **110** carried in races supported by a peripheral plate **112** which has a ring gear **114** thereon adapted to be engaged by a gear **116** for rotating the plate **112**. This plate **112** carries a screw **118** for delivering mix from the material at an extraordinarily rapid rate downwardly onto a platen **90**. The screw **118** further rests on roller bearings **120** carried by a framework **122** which may be welded or otherwise secured to the rails **64** and **66**. Hence, since the gear **116** is driven by a shaft **126** which in turn is driven by a motor **128**, the motor **128** being suitably supported in any desired manner, mix may be delivered onto the platen at a high rate of speed in a quantity adequate to fill the platen as it is being moved by the belt. The mix delivered by the hopper **98** is sufficient to fill the platen to a level equal to the height of the side rails **82** and **84**. In order to tamp the mix deposited thereon to a suitable level so that finishing material can be applied on the mix, the tamper indicated at **140** is utilized. This tamper **140** is mounted on a shaft **142** freely vertically movable as by gravity within a slot **144** carried by supports **146** suspended from the ceiling or other suitable structure in which the machine **26** is located or by means of a ground supported yoke, not shown. The tamper **140** is a polygonal unit **148**, shown as a hexagonal shaped revolving drum having a plurality of flat sides, **150**, six in number, and a plurality of apices **152**. Each of the apices are provided with recesses **154** therein for accommodating the upper portions of the end walls **92** of the platens as can be best seen in Figure 10. As the endless belt **28** carrying the platens **90** moves along, gravity causes the tamper **140** to assume the position as is shown in Figure 9, further movement of the belt will engage the end wall **92** of a platen in a recess **154** in an apex **150** whereby ensuing movement of the belt will cause the tamper **140** to both rotate and rise in the slot **144**. This will occur until the platen slowly descends to again attain the position as is shown in Figure 9 tamping the mix downwardly due to the weight of the tamper **140**. It is noted that the plates **150** of the tamper are slotted as at **158** and **160** for reception of the side rails or plates **82** and **84**.

After the belt passes beneath the tamper, it then passes beneath a hopper **164** which has a control means mounted on a shaft **166** and including a gate **168** for controlling flow of material therefrom. The hopper **164** is adapted to be filled with finishing material **170** such as a fine grain cementitious mix or the like. This deposits a quantity of finishing material on the platens having the tamp mixed thereon as it passes. The hopper **164** may be mounted by means of supports or brackets **172**, the amount of flow from the hopper being controlled by the position of the handle **174**. By means of brackets **176** secured to studs **178** mounted on the side rails **82** and **84** or elsewise as may be desired is a guide **180** within which a leveling member **182** is adapted to be reciprocated. The leveling member is reciprocated by means of a motor **186** mounted on a bracket **188** adjacent the conveyor belt and which motor drives a shaft **190** on which there is secured an eccentric or cam **192** engageable between guides **194** and **196** on the leveling member **182**. Hence, rotation of the eccentric **192** will cause transverse oscillatory movement of the leveler **182** in a rapid manner thus providing a very smooth surface on the block being produced.

After the platen with the mix having the finishing material thereon moves from underneath the leveler **182**, it passes beneath means for coloring the finishing material generally indicated at **200**. This means preferably includes as can be best seen in Figures 1 and 2 a plurality of hoppers **202** which feed pumps **204** for blowers which supply air ladden coloring powder through a plurality of nozzles **206** and onto the finishing material on the block being produced. Of course, each of the hoppers **204** may be filled with different colored or varieties of coloring powder to thereby enable either single color or multi-colored, marbleized or the like finished surfaces to be obtained.

The belt is as can be best seen in Figure 1 driven by a motor **210**. Obviously, a pulley arrangement, not shown, may be utilized in lieu of the separate power motors.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be restorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

In a machine for producing building blocks an endless belt conveyor, said endless belt conveyor having a plurality of transverse ribs spaced along the length thereof, end mounting wheels having annularly spaced notches in the periphery thereof, said belt being entrained about said end wheels with said ribs being received in said notches, a plurality of platens removably supported on said conveyor, said platens resting on said ribs and being arranged in end to end abutting relationship, said platens each having a vertically extending rear end wall extending transversely with respect to said conveyor, a tamper, said tamper being a rigid polygonal shaped weight disposed for free floating vertical movement above said conveyor, said tamper having spaced recesses therein, said rear end walls of said platens engaging said tamper in the recesses therein for rotating said tamper to raise said tamper whereby gravity will cause said tamper to press down on the mix on the next successive platen, a pair of guide rails, said guide rails being disposed on opposite sides of said conveyor, a plurality of axles, carried by said ribs, and guide wheels on said axles, said guide wheels riding on said guide rails, a pair of side plates fixedly carried by said guide rails in alignment with said platens, said side plates having inwardly extending tongues thereon.

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