

July 4, 1939.

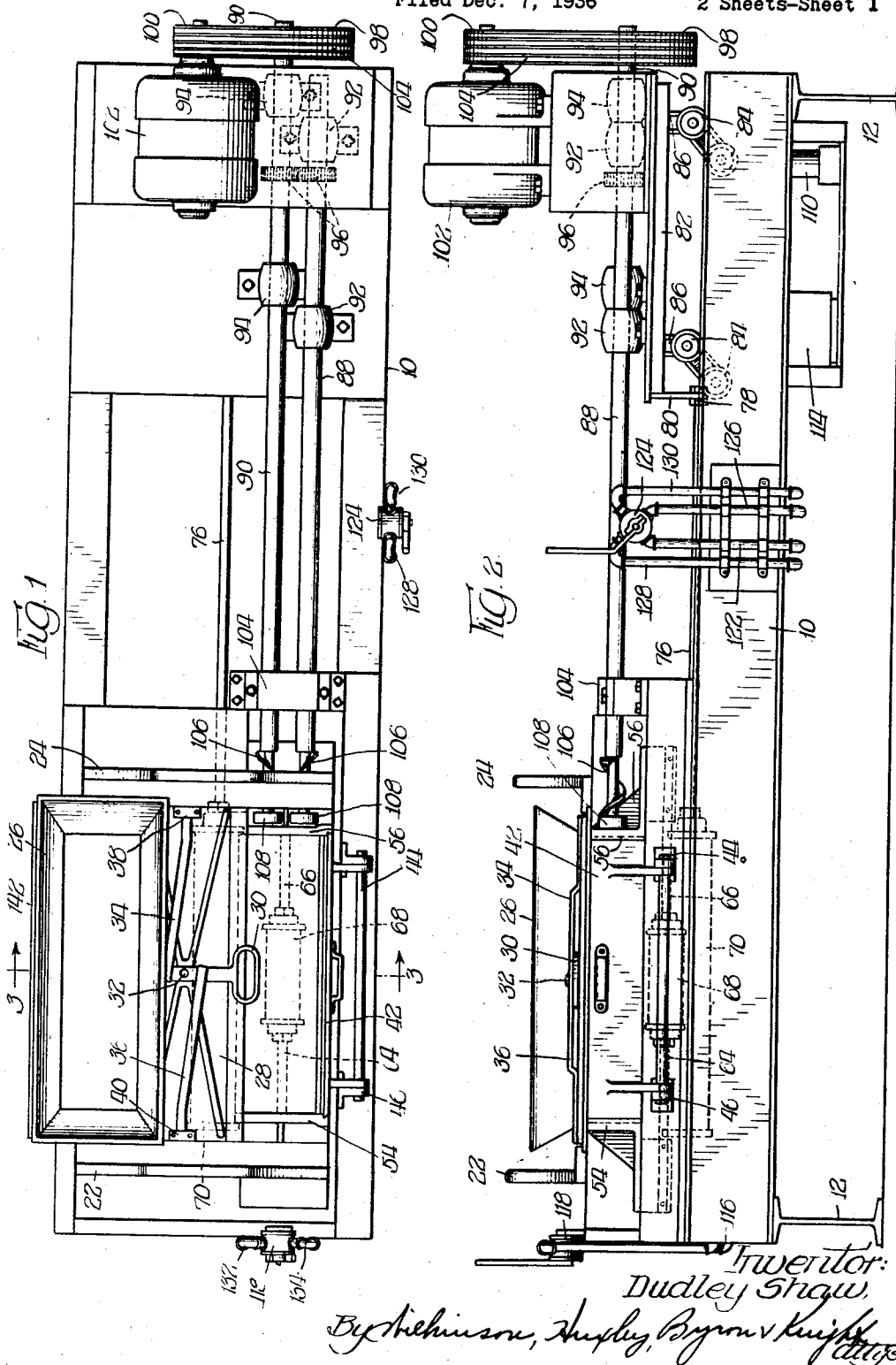
D. SHAW

2,164,953

BLOCK OR CONDUIT FORMING APPARATUS

Filed Dec. 7, 1936

2 Sheets-Sheet 1



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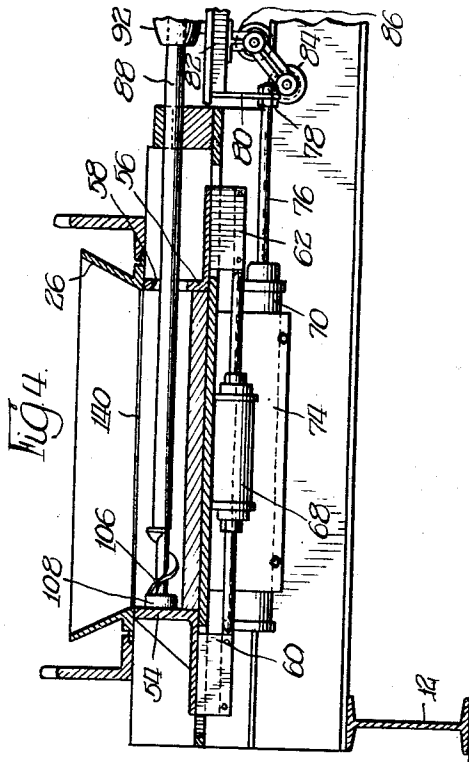
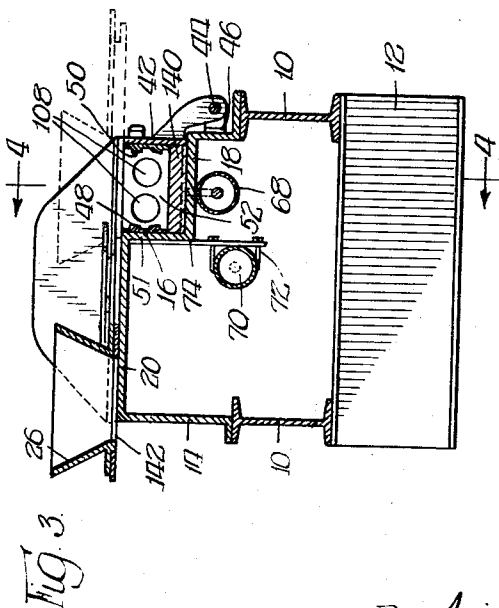
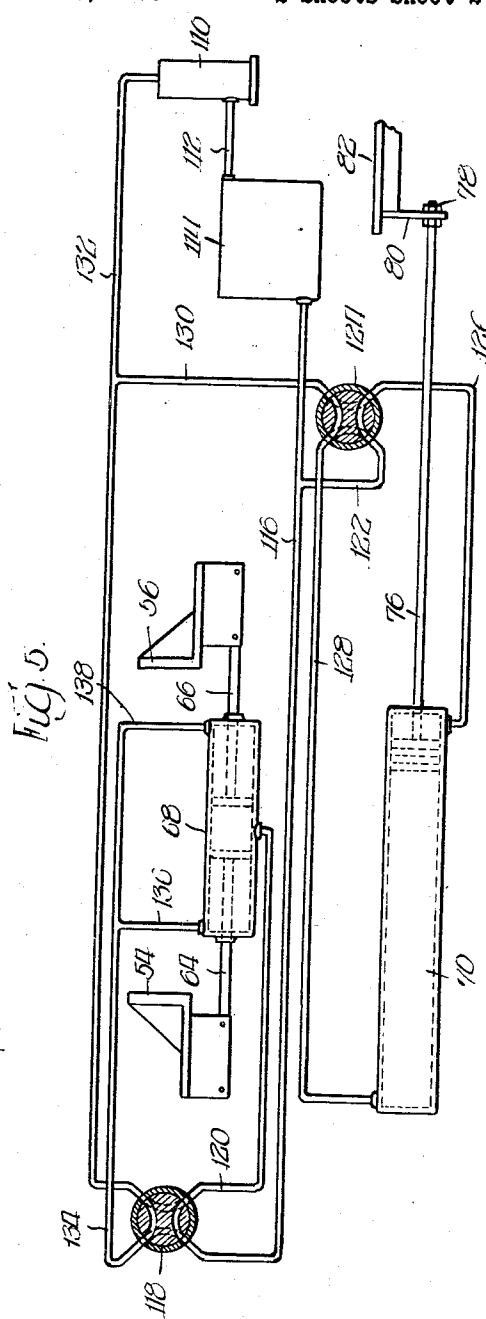
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,164,953

BLOCK OR CONDUIT FORMING APPARATUS

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Application December 7, 1936, Serial No. 114,625

8 Claims. (Cl. 25—36)

This invention pertains to a block or conduit forming machine, and more particularly to a machine for forming blocks or conduits to be used in building structures.

5 It is an object of this invention to provide a substantially automatic machine for forming building or other blocks of a predetermined shape and size.

10 Another object of the invention is to provide a machine for forming concrete building blocks which machine, when in operation, requires the attention of only a single operator.

15 A further object is to provide a building block forming machine wherein uniform blocks of a predetermined size and shape may be readily produced.

A still further object of the invention is to provide a machine for making concrete or other conduits, or multiple conduits.

20 With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, which illustrate an embodiment of the device and wherein like reference characters are used to designate like parts—

30 Figure 1 is a top plan view of the building block forming machine embodying the invention;

Figure 2 is a front elevation of the machine illustrated in Figure 1;

35 Figure 3 is a transverse sectional elevation of the machine shown in Figures 1 and 2, the same being shown substantially in the plane as indicated by the line 3—3 of Figure 1;

40 Figure 4 is a fragmentary longitudinal sectional elevation taken substantially in the plane indicated by the line 4—4 of Figure 3;

Figure 5 is a diagrammatic representation of the fluid operating mechanism for controlling the machine illustrated in Figures 1 to 4 inclusive.

45 In building certain modern structures it has been found desirable to employ a concrete or other block of light yet strong construction and wherein concealed mortar joints are used. Such a block is the subject matter of Patent No. 2,025,529 to Scudder, granted December 24, 1935. In the molding of such a block it is desirable that as few molds as possible be used, and the blocks formed as rapidly as possible from these molds. The machine contemplated herein provides a
55 rapid means for forming the block with a mini-

um of labor necessary for operation of the machine.

The machine consists essentially of the bed plate 10 which may be disposed on supports 12, said bed plate being provided adjacent one end thereof with a fitting or structure 14 having provided thereon the elongated mold receiving portion 16 which is formed of the stepped mold portion 18 and the upper track or support portion 20. The track portion 20 may be provided with the spaced side members 22 and 24 between which the hopper 26 is adapted to slide, the hopper being provided with the projecting mold plate 28 on which the pivoted hand hold 30 is mounted. Said hand hold is pivoted as at 32 to the mold plate and is provided with the transversely disposed locking members 34 and 36 extending through the guides 38 and 40 and adapted to be moved to lock the mold plate and hopper in predetermined positions.

A mold side plate 42 is pivotally mounted as at 44 on the brackets 46 mounted on the plate 16, the plate 42 being so pivoted that it may be revolved around the pivot 44, such as in a clockwise direction as viewed in Figure 3, in order to be moved to inoperative position. The mold pieces 48 and 50 are suitably secured to the side 51 of the mold cavity 52 and the plate 42, respectively, or may be fixed with respect thereto. The mold cavity is provided with the closed end bracket 54 disposed at the outer end of said cavity, and the inner end bracket 56 which is suitably apertured as at 58, the end brackets 54 and 56 being secured as at 60 and 62 to the piston rods 64 and 66 mounted in the fluid operating cylinder 68, said cylinder being preferably secured to the structure 14 below the mold cavity.

It will thus be seen that the mold cavity 52 is adapted to be closed and locked by means of the mold plate 28 and the locking members 30, 34 and 36, and ingress may be had to the cavity through the hopper 26 which may likewise be locked in position above and in vertical alignment with the mold cavity. The fluid operating cylinder 70 is suitably secured as at 72 to the vertical anchor plate 74 provided on the structure 14. The piston 76 of said cylinder extends toward the opposite end of the bed plate and is secured as at 78 to the bracket 80 provided on the movable carriage 82.

The carriage 82 is suitably mounted to be moved on the rollers 84 pivoted to the pedestals 86 provided on said carriage, and the longitudinally extending shafts 88 and 90 (shown two in number) are journaled respectively at 92 and
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94 to said carriage and geared to be rotated together as at 96. The shaft 90 is provided with the pulley 98 which is connected to the pulley 100 of the electric motor 102 by means of suitable belt means 104. While an electric motor is shown, it is of course to be understood that any other suitable power means may be used. The shafts 88 and 90 are likewise journaled as at 104 to the bed plate and adjacent their ends said shafts are provided with the helices 106 and the end cylindrical portions 108 adapted to form packing and ironing means.

In order to provide control means for operation of the cylinders 68 and 70, a suitable pump 110 may be provided adapted to be connected through piping 112 to a source of fluid supply 114, the source of fluid supply being connected through the pipe 116 to the valve 118, which valve may be conveniently located adjacent the end of the bed plate, such as shown in Figures 1 and 2. One connection from said valve, such as the pipe 120, is connected to the cylinder 68 between the pistons of the piston rods 64 and 66. The branch pipe 122 is also connected to the pipe 116, said pipe 122 being connected to the valve 124 which may be conveniently located on the bed plate between the hopper and the carriage 82 such as also indicated in Figures 1 and 2.

One connection from the valve 124, such as the pipe 126, is connected adjacent one end of the cylinder 70, shown as the right end thereof. Another pipe 128 is connected adjacent the opposite end of the cylinder 70 and to the valve 124. The pipe 130 is connected to the valve 124 and to the pipe 132 connected at one end to the pump 110, and at its opposite end to the valve 118. Another pipe 134 is connected adjacent one end of the valve 118 and connected through branch pipes 136 and 138 to opposite ends of the cylinder 68.

Assuming that the machine is inoperative and it is desired to form a molded block of some material such as concrete, mold pieces 48 and 50 are placed in the required position, or are fastened in the mold cavity to one side 51 thereof, and to the mold side plate 42. It may be necessary to place in the mold cavity 52 the filler plate 140. The plate 42 may then be revolved about the pivot 44 to close the side of the mold cavity 52. The hopper 26 is then slid and locked in position above the mold cavity. Material either in the hopper or placed in the hopper is then permitted to flow downwardly into the mold cavity, the hopper being locked in position by means of the hand hold 30 and the locking members 34 and 36.

Prior to the introduction of material into the mold cavity, the valve 124 will have been operated to connect the pipes 116, 122 and 126, and the valve 118 will be operated to connect the pipes 116 and 134. The piston rod 76 will have been moved toward the left as viewed in Figures 1, 2 and 5, causing the helices 106 to be moved into a position as shown in Figure 4, that is, within the mold cavity and closely abutting the outer end bracket 54 which will have been moved into a position to close the mold cavity by the pistons 64 and 66. After introduction of the material into the mold cavity the hopper may be slid into a position where the mold plate 28 closes the mold cavity, being locked in this position by means of the members 30, 34 and 36.

The circuit to the motor 102 may then be closed, causing rotation of the shafts 188 and 190, and consequently the helices 106. It is pref-

erable, however, that the motor be continuously operated in order to save current cost, as rather heavy starting current is required, which continuous operation gives a slight packing effect prior to the hopper 26 being slid back and the top or mold plate 28 being in position to close the mold cavity. The valve 124 may then be shifted so that the pipes 116, 122 and 128 are then connected to slowly move the piston rod 76 toward the right as viewed in Figures 1, 2, 4 and 5, consequently moving the rotating shafts toward the right, causing suitable apertures to be formed in the block, and also causing the block being formed to be tightly packed by the ironing or packing action of the members 108. Waste will be extruded through the aperture 58, and suitably caught in an adjacent receptacle. The above operation of the valves and piping system for controlling operation of the pistons 68 and 79 assumes that the pump 110 applies pressure to the fluid in the tank or reservoir 114. If a suction type of pump is used at 110, the valves of course must be operated in a different manner. For example, in order to move the brackets 54 and 56 to close the mold cavity, the valve 118 must be moved to connect the pipe 132 with the pipe 134 and branch pipes 136 and 138. To move the carriage 82 from a position such as shown in Figure 4 where the shafts are within the mold cavity to the extended position where the helices are removed from the mold cavity, the valve 124 must be moved so that the pipe 130 is connected to the pipe 128. Connection of the pipe 132 through the valve 118 to the pipe 120 will cause the brackets 54 and 56 to be moved to inoperative position, and connection between the pipe 130 through the valve 124 to the pipe 126 will cause the carriage 82 to be moved toward the left as viewed in the figures. It is also appreciated that an operable closure member may be provided for the hopper 26 such as shown, as the slide 142 for controlling the flow of material from the hopper into the mold cavity.

After suitable packing has taken place the valve 118 is moved to a position to connect the pipe 116 with the pipe 120, causing outward movement of the pistons 64 and 66 to move the brackets 54 and 56 away from the mold cavity. The hopper will have been slid to a position where the mold plate is removed from its closure position above the mold cavity, whereupon the front plate 42 may be revolved to released position to permit removal of the formed block from the mold cavity.

While the machine illustrated shows only a pair of shafts and means for forming block or conduit apertures, it is appreciated that any number may be used, suitable bearings and motor connections being provided, and it is to be understood that I do not wish to be limited by the exact embodiment of the device shown, which is merely by way of illustration and not limitation, as various and other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. In a device of the character described, the combination of a bed plate having an elongated stepped mold portion, a plate hinged to said bed plate adjacent said stepped portion and movable to seat on said stepped portion to form a side thereof, movable members disposed on said bed plate for forming opposite ends of said mold portion, means for controllably moving said

movable members, a hopper slidably mounted on said bed plate and movable to be disposed in vertical alignment with said mold portion, a mold plate on said hopper movable therewith to be disposed above and to close said mold portion, means for moving and locking said hopper and mold plate in selected positions, a slidable carriage mounted on said bed plate and movable with respect to said mold portion, means for moving said carriage, a plurality of shafts journaled on said bed plate and carriage and movable with said carriage, said shafts having ends adapted to extend through apertures in the adjacent movable member into said mold portion, said ends each having an end cylindrical portion and an adjacent helical portion for forming apertures and packing the block to be formed in said mold portion, power means on said carriage for rotating said shafts, and means for selectively moving said carriage.

2. In a device of the character described, the combination of a bed plate having an elongated stepped mold portion, a plate hinged to said bed plate adjacent said stepped portion and movable to seat on said stepped portion to form a side thereof, movable members disposed on said bed plate for forming opposite ends of said mold portion, means for controllably moving said movable members, a hopper slidably mounted on said bed plate and movable to be disposed in vertical alignment with said mold portion, a mold plate on said hopper movable therewith to be disposed above and to close said mold portion, means for moving and locking said hopper and mold plate in selected positions, a slidable carriage mounted on said bed plate and movable with respect to said mold portion, means for moving said carriage, a shaft journaled on said bed plate and carriage and movable with said carriage, said shaft having an end adapted to be extended into said mold portion, said end having an end cylindrical portion, and an adjacent portion for forming apertures and packing the block to be formed in said mold portion, power means on said carriage for rotating said shaft, and means for selectively moving said carriage.

3. In a device of the character described, the combination of a bed plate having an elongated stepped mold portion, a plate adapted to be disposed to form a side thereof, movable members disposed on said bed plate for forming opposite ends of said mold portion, means for controllably moving said movable members, a hopper slidably mounted on said bed plate and movable to be disposed in vertical alignment with said mold portion, a mold plate on said hopper movable therewith to be disposed above and to close said mold portion, means for moving and locking said hopper and mold plate in selected positions, a slidable carriage mounted on said bed plate and movable with respect to said mold portion, means for moving said carriage, a shaft journaled on said bed plate and carriage and movable with said carriage, said shaft having an end adapted to be disposed through an aperture in the adjacent movable member into said mold portion, said end having an end cylindrical portion and an adjacent helical portion for forming apertures and packing the block to be formed in said mold portion, power means on said carriage for rotating said shaft, and means for selectively moving said carriage.

4. In a device of the character described, the combination of a bed plate having an elongated stepped mold portion, a plate adapted to be dis-

posed to form a side thereof, members disposed on said bed plate for forming opposite ends of said mold portion, a hopper slidably mounted on said bed plate and movable to be disposed in vertical alignment with said mold portion, a mold plate on said hopper movable therewith to be disposed above and to close said mold portion, means for moving and locking said hopper and mold plate in selected positions, a slidable carriage mounted on said bed plate and movable with respect to said mold portion, means for moving said carriage, a shaft journaled on said bed plate and carriage and movable with said carriage, said shaft having an end adapted to be disposed through an aperture in the adjacent end member into said mold portion, said end having an end cylindrical portion and an adjacent helical portion for forming apertures and packing the block to be formed in said mold portion, power means on said carriage for rotating said shaft, and means for selectively moving said carriage.

5. In a device of the character described, the combination of a bed plate having an elongated stepped mold portion, a plate adapted to be disposed to form a side thereof, members disposed on said bed plate for forming opposite ends of said mold portion, means for filling said mold portion, a mold plate movable to be disposed above and to close said mold portion, means for moving and locking said mold plate in selected positions, a slidable carriage mounted on said bed plate and movable with respect to said mold portion, means for moving said carriage, a shaft journaled on said bed plate and carriage and movable with said carriage, said shaft having an end adapted to be disposed through an aperture in the adjacent end member into said mold portion, said end having an end cylindrical portion and an adjacent helical portion for forming apertures and packing the block to be formed in said mold portion, power means on said carriage for rotating said shaft, and means for selectively moving said carriage.

6. In a device of the character described, the combination of a bed plate having an elongated stepped mold portion, a plate hinged to said bed plate adjacent said stepped portion and movable to seat on said stepped portion to form a side thereof, movable members disposed on said bed plate for forming opposite ends of said mold portion, means for controllably moving said movable members, a hopper slidably mounted on said bed plate and movable to be disposed in vertical alignment with said mold portion, a mold plate on said hopper movable therewith to be disposed above and to close said mold portion, means for moving and locking said hopper and mold plate in selected positions, a slidable carriage mounted on said bed plate and movable with respect to said mold portion, means for moving said carriage, a plurality of shafts journaled on said bed plate and carriage and movable with said carriage, said shafts having ends adapted to extend into said mold portion, said ends each having boring and packing means thereon, power means on said carriage for rotating said shafts, and means for selectively moving said carriage.

7. In a device of the character described, the combination of a bed plate having an elongated stepped mold portion, a plate hinged to said bed plate adjacent said stepped portion and movable to seat on said stepped portion to form a side thereof, movable members disposed on said bed plate for forming opposite ends of said mold

portion, means for controllably moving said movable members, a hopper slidably mounted on said bed plate and movable to be disposed in vertical alignment with said mold portion, a mold plate on said hopper movable therewith to be disposed above and to close said mold portion, means for moving and locking said hopper and mold plate in selected positions, a slidable carriage mounted on said bed plate and movable with respect to said mold portion, means for moving said carriage, a shaft journaled on said bed plate and carriage and movable with said carriage, said shaft having an end adapted to be disposed in said mold portion, said end having boring and packing means thereon, power

means for rotating said shaft, and means for selectively moving said carriage.

8. In a device of the character described, the combination of a bed plate having an elongated mold portion, means for filling said mold portion, means for closing the mold portion after filling, a slidable carriage mounted on said bed plate and movable with respect to said mold portion, a shaft journaled on said carriage and movable therewith, said shaft having an end adapted to be disposed in said mold portion, said end having boring and packing means thereon, and power means mounted on said carriage for rotating said shaft.

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