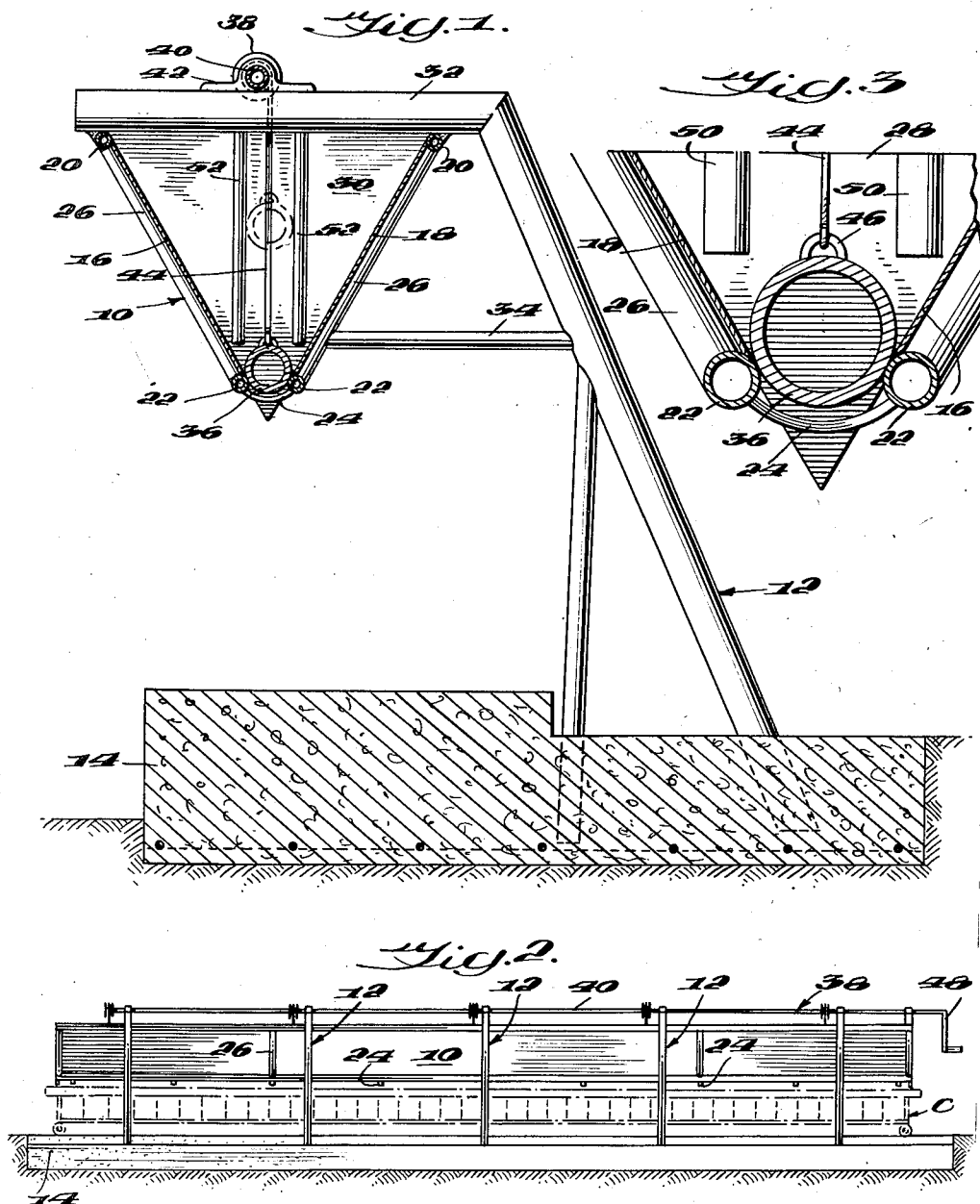


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A. H. STOCKMAR
 ARCULATE-EDGED DISCHARGE OPENING FOR HOPPER,
 AND AN ARCULATE CLOSURE FOR SAID OPENING
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Inventor

Albert H. Stockmar

By

Leech & Radue

Attorneys

UNITED STATES PATENT OFFICE

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ARCUATE-EDGED DISCHARGE OPENING
FOR HOPPER, AND AN ARCUATE CLOSURE
FOR SAID OPENING

Albert H. Stockmar, Villa Rica, Ga.

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This invention relates to improvements in hopper constructions and particularly to a type of hopper which may be used in discharging a plastic material such as wet poured concrete into molds.

It is a general object of this invention to provide a hopper which may be used to fill simultaneously a plurality of molds arranged side by side or one or more elongated molds.

In its more specific aspects, the invention includes provisions for a hopper valve construction which may be easily operated to give a readily controlled, free flow of wet poured concrete or similar material.

A further object of this invention is to provide a valve construction which may be adapted generally to purposes for which an elongated discharge opening or slot is essential.

More specifically stated, it is the object of this invention to provide a valve construction including a parallel pair of seat members having arcuate surface portions for seating a cylindrical, valve closure member, and means for maintaining the valve closure member in alignment with the seat members as the valve is opened and closed.

These and other features of improvement contributing to ease of operation, and dependability in use will be apparent from the following detailed description of a preferred embodiment of the hopper construction taken in connection with the accompanying drawings, in which:

Fig. 1 is an end elevation, partly in section of the hopper construction and its support;

Fig. 2 is a rear elevation of the hopper showing a plurality of molds in position for filling; and

Fig. 3 is an enlarged detail section showing the valve construction.

In Figs. 1 and 2, a trough-shaped hopper 10 is suspended in a horizontal position from a plurality of spaced cantilever supporting frames 12, 12 embedded in a concrete anchoring base 14.

Referring to Fig. 1, it will be noted that the hopper 10 has a pair of downwardly converging sides 16 and 18, formed preferably of relatively light sheet metal, and integrally secured, as by welding, to a pair of upper longitudinal members 20, 20, which may conveniently be tubular pipes as shown.

A corresponding pair of close spaced and parallel lower longitudinal members 22, 22 are maintained in fixed relation by a number of metal strips or spacer pieces 24, 24, which may be welded in place. The trough frame is com-

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pleted by lateral frame members 26, 26 extending between the upper and longitudinal frame members 20 and 22 on the outside of the trough sides 16 and 18. As indicated in Fig. 2, additional sets of lateral frame members may be necessary between the ends of the hopper when the latter is of considerable length. The hopper 10 is completed by sheet metal ends 28, 30 of triangular shape. These ends 28 and 30 are integrally secured to the sides 16 and 18 and the several hopper frame members by welding or other convenient means.

Each cantilever supporting frame 12 includes a horizontal arm 32 to which the upper edges of the hopper 10 are secured, as by welding, and a strut 34 which may be secured by welding to an adjacent lateral frame member 26 a short distance above the bottom of the hopper.

As shown best in Fig. 3, a cylindrical valve member or pipe 36 extends lengthwise of the hopper 10 and is seated on convex arcuately curved surfaces of the lower longitudinal frame members 22, 22, the valve pipe 36 in this instance spanning and being of appreciably larger diameter than the frame members 22, 22. While the lower longitudinal members 22, 22, defining a lengthwise rectangular slot in the hopper 10, are cylindrical because made from lengths of pipe, it is essential only that they be of such shape in cross-section as to provide arcuate valve seat members along the respective lower edges of the hopper sides 16, 18. It will also be apparent that the basic requirements for the valve closure member 36 are that it be cylindrical or arcuate where it engages the valve seat members, that it span those members, and that it be free from interference with the metal spacer strips 24, 24, which are bent downwardly for this reason in the illustrative embodiment.

In addition to providing a self-centering seat for the valve closure member 36, the parallel longitudinal pipes 22, 22 give the most efficient orifice flow for a given slot width and produce a desirable lateral divergence of the discharge jet of wet pouring concrete mix, providing as they do rounded lip orifice portions extending beyond the bottom of the hopper 10. The cylindrical valve member 36 besides cooperating as indicated with the valve seat member 22, 22 has a cross-section which permits it to be moved easily through the plastic mix in the hopper 10.

A multiple windlass 38 comprising a windlass shaft 40, extending lengthwise above the hopper 10 and supported in bearings 42, 42 on frame arms 32, is used to raise and lower the valve member 36

through a plurality of individual cables 44, 44 having their lower ends secured at spaced points to the valve member 36 by means such as an eye 46. As will be apparent from a consideration of Fig. 2, rotation of the windlass shaft 40 by means of a crank 48 extending from one end will cause the several cables 44 to wind or unwind to raise or lower the valve closure member 36 evenly. This flexible hoist means of support for the valve pipe 36 and the viscous nature of the material which is to be fed from the hopper 10 makes it desirable to provide restraint against lateral movement as the valve pipe 36 is moved up and down. The desired restraining may be accomplished by welding a pair of parallel guides in the form of small pipe sections 50, 50 or 52, 52 to the respective hopper ends 28 and 30. These guides are identically arranged to extend from the top of the hopper nearly to the bottom, as shown in Fig. 1, are spaced so as to receive the ends of the pipe 36 with only a small amount of clearance, and are effective as soon as the pipe 36 has risen appreciably from its seated position on the lower longitudinal members 22, 22. The sliding engagement of cylindrical pipe 36 with the cylindrical guide 50 or 52 results in a minimum of sliding friction. In Fig. 1, the pipe 36 is shown by dotted lines in elevated position between the guides 52, 52.

When a wheeled rack or conveyor of concrete molds C is moved under the hopper 10, as illustrated in Fig. 2, it will be possible to fill the entire set of molds uniformly and without spillage, as the hopper 10 and the conveyor supported molds are substantially coextensive in length and the molds may be readily centered beneath the discharge opening of the hopper. Assuming that the hopper is first filled with the amount of wet poured concrete necessary to fill the molds, the operator will turn the crank 48 to operate the multiple windlass and raise the cylindrical valve member 36 uniformly above its seated position to permit discharge of the concrete uniformly into each of the molds or throughout the length of the set of molds. If desired, a measured amount of concrete sufficient only to fill the molds exactly may be placed in the hopper before the valve member 36 is operated. Upon release of the windlass crank 48, the valve pipe 36 will move freely and accurately in alignment with the slot of hopper 10 and into its original seated position.

While there has been described a preferred embodiment of this invention and one field of use in which it possesses a high degree of utility, it is not intended that the scope of the invention should be limited to any particular form of construction or arrangement of parts other than as may be required by the scope of the following claims:

Having thus described my invention, what I claim as novel and desire to secure by Letters Patent of the United States is:

1. Concrete pouring apparatus comprising a trough-shaped hopper having a rectangular slot extending lengthwise of the bottom with a pair of parallel cylindrical members defining the sides of the slot, a cylindrical valve closure member of greater diameter than said parallel members constructed and arranged to seat on said parallel members and close said slot, a multiple windlass secured to the valve closure member at spaced points throughout its length and operable to control movement of the closure member to and from its slot closing position, and a vertical pair of parallel guides secured inside each end of the hopper and arranged to receive the corresponding end of the closure member.

2. Concrete pouring apparatus comprising a trough-shaped hopper formed by downwardly converging opposite sides and triangular ends, a parallel pair of longitudinal pipes secured respectively to the lower edges of said sides to define a rectangular slot with a convex arcuate valve seat member on each side, a valve closure member in the form of a pipe of greater diameter than said longitudinal pipes constructed and arranged to rest on said valve seat members and close said slot, means for elevating said valve closure member evenly, and a vertical pair of parallel guide pipes secured to the inside of each triangular end and arranged to guide opposite ends of said valve closure member in a plane aligned with said slot.

3. Concrete pouring apparatus comprising a hopper having converging side portions defining an elongated discharge slot; a parallel pair of elongated members extending along the respective edges of said slot as continuations of the corresponding inner surfaces of the side portions; and an elongated internal valve closure member having a cylindrical portion adapted to seat on said elongated members to close said discharge slot, said elongated members each being of convex and arcuate shape in the portion engaged by said valve closure member and having said shape continuing outwardly beyond said hopper to form a rounded lip orifice portion.

ALBERT H. STOCKMAR.

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