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L. H. EICHELBERGER

APPARATUS FOR MIXING MATERIALS

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Fig. 2.

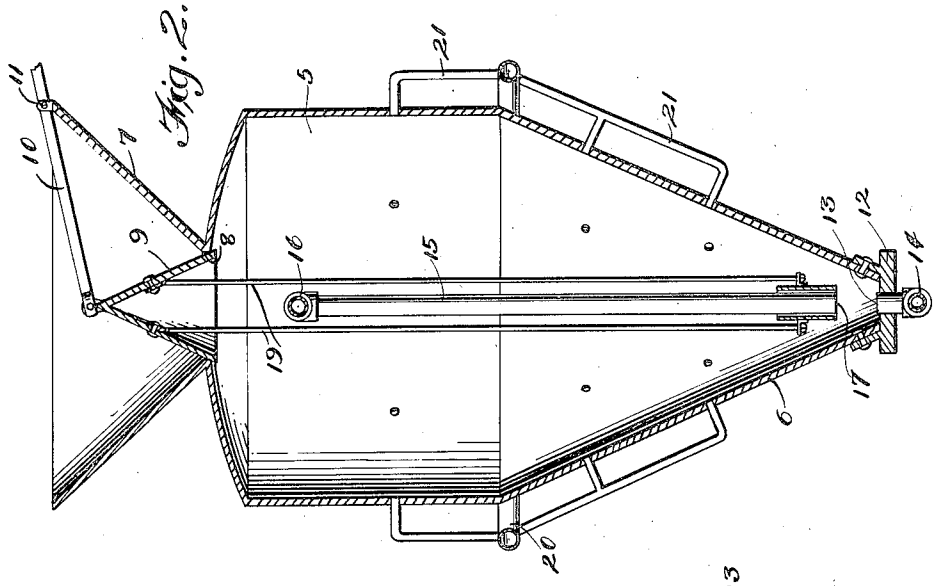
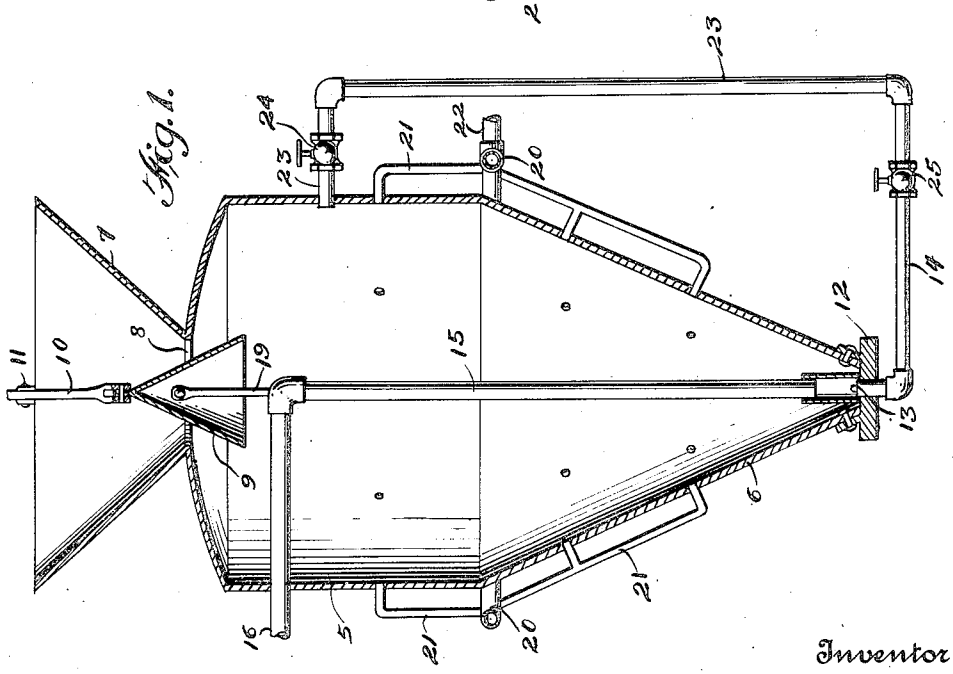


Fig. 1.



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UNITED STATES PATENT OFFICE.

LEWIS HAY EICHELBERGER, OF BALTIMORE, MARYLAND.

APPARATUS FOR MIXING MATERIALS.

Application filed October 20, 1922. Serial No. 595,718.

To all whom it may concern:

Be it known that LEWIS HAY EICHELBERGER, a citizen of the United States, residing at Baltimore, in the State of Maryland, has invented certain new and useful Improvements in Apparatus for Mixing Materials, of which the following is a specification.

This invention relates to an improved apparatus for mixing, agitating and discharging materials under pressure, and is particularly adapted for mixing or agitating fluid or semi-fluid materials such as concrete, paint and similar materials and then forcing the material from the apparatus by a jet of fluid pressure.

One object of the invention is to provide an improved apparatus whereby the material may be readily mixed by the action of fluid pressure; then forced from the mixing chamber also by the action of fluid pressure which latter is supplied in a manner to prevent the material from arching in the mixing receptacle and thereby interfering with the discharge thereof.

The invention is illustrated in the accompanying drawing in which—

Fig. 1. shows the improved apparatus in sectional elevation and in condition for charging and mixing materials, and

Fig. 2. illustrates the hopper; the upper and lower walls of the mixing receptacle; the discharge tube and the cut-off valve in the open position ready to discharge the mixed material from the receptacle.

Referring to the drawing the numeral 5, designates a receptacle, preferably with a tapering lower end 6, and provided with a flaring hopper 7, at its upper end in the base of which there is a feed opening 8, through which the materials may pass into the receptacle.

A cone valve or plug 9, is located between the hopper and receptacle with its tapering end projecting upwardly through the feed opening 8, and the upper end of said cone-valve is connected to the inner end of an operating lever 10, which latter is pivoted at 11, to the edge of the hopper wall. Obviously, by rocking the lever, the cone valve may be depressed to uncover the feed-opening, or, be elevated, to close the latter as desired.

The lower tapered end 6, of the receptacle is closed by a plate 12, and an up-turned discharge-end 13, of an air-supply pipe 14, enters from the under side of said plate so as to direct a supply of air under pressure upwardly, for a purpose presently to be explained.

A pipe 15, extends upwardly through the center of the receptacle and at a point beneath the cone-valve said pipe has a lateral bend 16, which passes through the wall of the receptacle and leads to a place of discharge. The lower end 17, of the pipe 15, terminates at a point somewhat spaced or elevated with respect to the bottom plate 12, and around said end I provide an annular sleeve 18, of sufficient length to bridge the space between the lower end 17, of the pipe and the plate 12, whereby to cut off communication between the interior of the receptacle and the said pipe for reasons presently to be described.

The sleeve 8, while closely fitting the pipe-end 17, is sufficiently free to be moved vertically thereon and two rods 19, have their lower ends connected to the sleeve at diametrically-opposite sides of the latter, and these rods extend vertically at opposite sides of the pipe 15, and have their upper ends connected to the cone-valve. By means of the rod connections between the cone-valve and sleeve, the valve and sleeve will be raised and lowered simultaneously, so that when the cone is lowered to open the feed opening 8, the sleeve will be lowered to close communication between the pipe and the interior of the receptacle. When the cone-valve is moved to the closed position the sleeve will be moved to the open position.

Around the receptacle I provide a circular pipe or header 20, from which a series of small pipes 21, branch and enter the wall of the receptacle. The branch pipes being distributed so that jets of air may be directed into the receptacle at numerous places. A supply-pipe 22, connects with the header and supplies the latter with compressed air at the desired pressure.

A pipe 23, extends from the upper portion of the receptacle and extends down to and connects with the air supply pipe 14,—a valve 24, being provided in the pipe 23, to control the passage of air through the latter.

A valve 25, is also provided in pipe 14, to control the passage of air to the discharge-end 13, of said pipe.

In the operation of the apparatus, all air will be cut off, cone-valve 9, will be lowered to uncover feed opening 8, and

sleeve 18, will be lowered to close communication between pipe-end 17, and the interior of the receptacle. The materials to be mixed will then be fed into the receptacle through the feed opening 8, after which air will be admitted through the branch pipes 21, from the header 20. This air under pressure is utilized to agitate and mix the mass. when the mixing operation is completed, cone-valve 9, will be raised to close feed opening 8, and to elevate sleeve 18, and open the lower end of pipe 17, into the receptacle. Valves 23 and 25, will then be opened so as to permit the passage of air through pipes 14 and 23, and the air supplied on top of the mass by pipe 23, will force the materials down in the receptacle while the air passing from the discharge-end 13, of pipe 14, enters the lower end 17, of pipe 15, and draws the material from the receptacle up through pipe 15, and laterally by pipe 16, to a point of discharge.

By providing pressure on top of the mass and discharging from the bottom of said mass, liability of the mass to arch in the receptacle and thereby fail to feed down to the lower end, is avoided.

The operation of mixing and discharging is quickly carried on with no moving mechanisms except the valve 9, and sleeve 18.

Having described my invention, what I claim is,—

1. In an apparatus for handling materials the combination with a receptacle having a contracted portion, of a discharge pipe on the interior of the receptacle with its lower end terminating slightly above the lower end of the contracted portion and said pipe passing through the wall of the receptacle and leading to the exterior thereof; valve means for controlling the inlet of material to the receptacle; means at the lower end of said discharge pipe for cutting off communication between said pipe-end and the interior of the receptacle and means for admitting fluid under pressure into the receptacle beneath the said lower end of the discharge pipe to force the materials from the receptacle up through said discharge pipe.

2. In an apparatus for handling materials the combination with a receptacle having a contracted portion, of a discharge pipe on the interior of the receptacle with its lower end terminating slightly above the lower end of the contracted portion and said pipe passing through the wall of the receptacle and leading to the exterior thereof; valve means for controlling the inlet of material to the receptacle; a sleeve movable on the lower end of said discharge-pipe for closing communication between said end and the interior of the receptacle, means for moving said sleeve and means for admitting fluid under pressure into the receptacle at said sleeve and pipe-end to force material from the receptacle up through said discharge-pipe.

3. In an apparatus for mixing materials the combination with a receptacle having an inlet for materials, of a discharge pipe communicable with the interior of the receptacle and extending to the exterior of the latter; valve means at the said inlet; means for cutting off communication between the discharge pipe and the interior of the receptacle; means for agitating the material in the receptacle; means for connecting the valve means and the pipe cut off means whereby to open one and close the other, and pressure means for drawing material from the receptacle and discharging it through said pipe.

4. In an apparatus for mixing materials the combination with a receptacle having an inlet for materials, of a discharge pipe terminating in the receptacle near the bottom of the latter; valve means at the receptacle inlet; means movable with respect to the pipe to control communication between said pipe and the interior of the receptacle; connections between said valve means and said movable means to operate them simultaneously and fluid pressure means for conveying the materials through said discharge pipe.

5. In an apparatus for mixing materials the combination with a receptacle having a tapered lower end and having a filling opening at its upper end, of a discharge pipe in the receptacle and terminating in the tapered lower end; a valve controlling the filling opening; a sleeve on the lower end of the pipe to close the latter from communication with the interior of the receptacle; connections between the sleeve and the valve to operate them simultaneously and means for directing a blast of fluid under pressure into the discharge pipe to draw material from the receptacle.

In testimony whereof I affix my signature.

LEWIS HAY EICHELBERGER.