June 24, 1930. J. F. BURN ET AL 1,767,430

MEANS FOR SUPPLYING LIQUID TO DRUMS OF CONCRETE OR OTHER MIXING MACHINES

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Fig. 1.

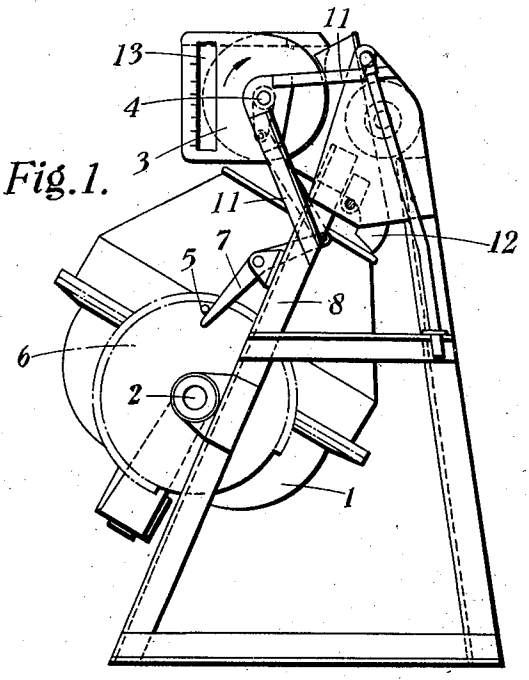
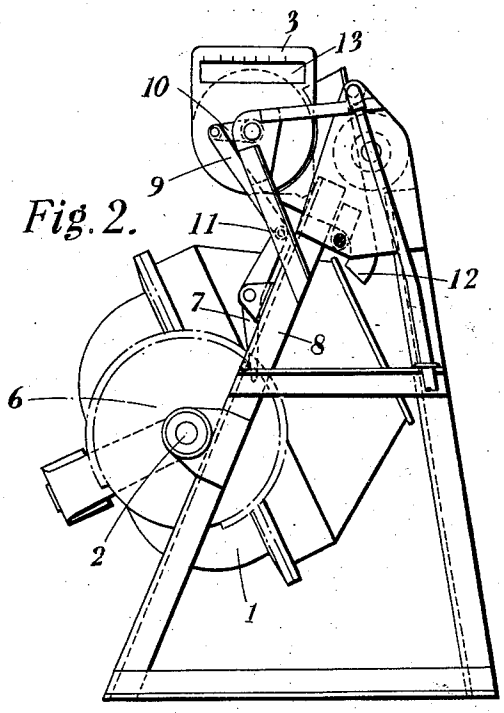


Fig. 2.



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Fig. 3.

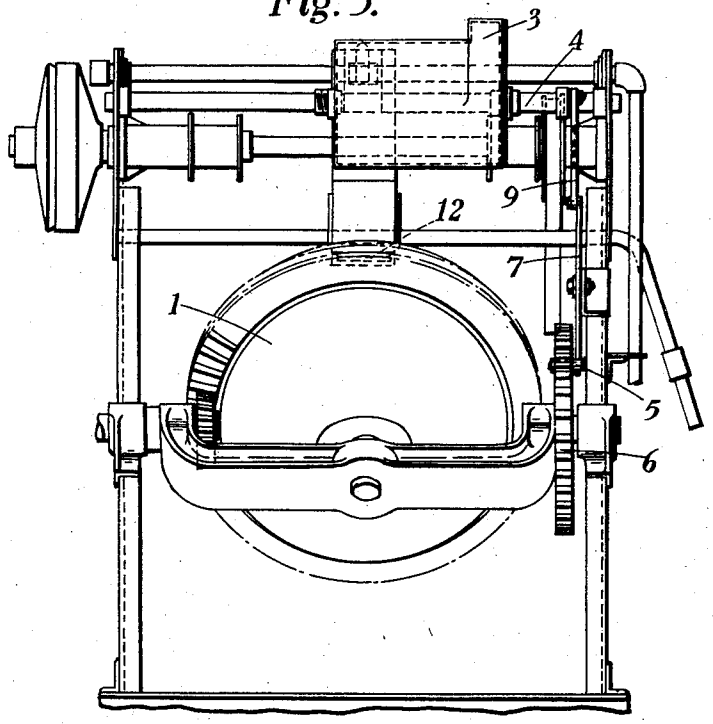


Fig. 4.

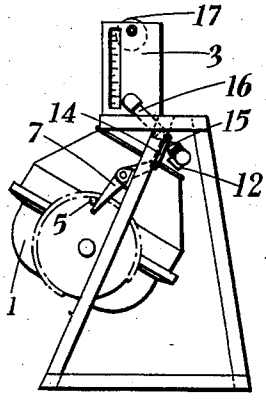


Fig. 5.

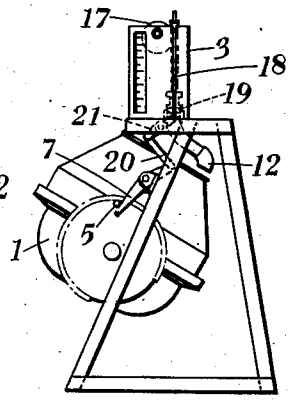
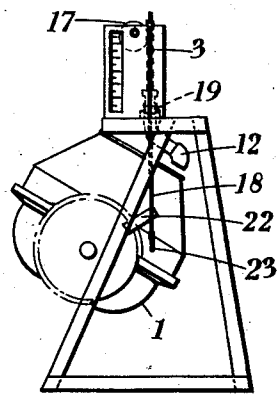


Fig. 6.



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UNITED STATES PATENT OFFICE

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MEANS FOR SUPPLYING LIQUID TO DRUMS OF CONCRETE OR OTHER MIXING MACHINES

Application filed February 7, 1929, Serial No. 338,297, and in Great Britain January 17, 1928.

This invention consists of improvements in means for supplying liquid to mixing machines, such as concrete mixers, and it relates to the operation of causing the liquid to enter the mixing vessel automatically at the most suitable moment without prolonging the working time of the machine or making any extra demand upon the driving power employed in the same. Though our invention will here be described in connection with the use of water in a concrete mixer, it is to be understood that it is not restricted to such an application, because it could easily be adapted for other purposes, including tar and bitumen mixing, mortar mixing and various kinds of contractors' work.

The quantity of water used in concrete mixers varies from time to time according to circumstances, such as weather, temperature, humidity or dryness of the atmosphere, pressure of the supply and the condition of the sand and the aggregate, which will absorb more or less water according to their porosity and existing moisture content, the only fairly constant ingredient being the cement, the proportion of water for which can be gauged beforehand. We may find it convenient, therefore to measure the volume of water simply by means of a hand-operated valve or the like and a suitable dial enabling it to be adjusted according to circumstances, though an automatic measuring device is not excluded if, in certain cases, this may be deemed more suitable for the purpose. The water level may be indicated by a glass plate let into a slit in the side of the tank which will avoid the risk of breakage attendant upon the use of an external gauge glass.

For ordinary purposes, an efficient sluice valve is proposed, conveniently within reach of the operator's hand so that he can measure the quantity of water about to go into the drum according to the scale on his tank. This valve will be large enough and suitable for the lowest of pressures and at the same time can be replaced by a hand pump, if desired.

By way of illustration a few typical examples of our invention are shown in the accompanying drawings, reference being made to these in the further description which follows.

Figure 1 is a side elevation of an "open drum" mixer in association with a tipping water tank the various parts being shown more or less diagrammatically.

Figure 2 represents the same mixer after the movable parts have moved.

Figure 3 is a view at right angles to Fig. 2.

Some alternative forms are illustrated in side elevation in the three small remaining figures, all illustrating "open drum" mixers, combined with a non-tipping water tank.

Figure 4 showing a discharge cock,

Figure 5 a discharge plug, and

Figure 6 a pull-rod discharge device.

Describing one application and form of our invention with reference to Figures 1, 2 and 3, by way of example, and without entering into unnecessary detail, we propose to proceed as follows. A concrete mixing machine of the frusto-conical open drum type is taken this type having provision for swinging the drum 1 about a horizontal axis 2, in the well known manner. This action of swinging the drum from its discharge position into its charging position, at a suitable moment, causes a water tank 3, conveniently pivoted above it at 4, to tip over and discharge its contents into the drum 1, the pivots 4 being mounted in bearings carried by bracket arms 11 on the main frame 8. The mechanism for tipping the tank automatically comprises a stud 5, (e. g. a pin fitted with a roller) attached to the drum segment 6, and a rocking lever 7 mounted on a member of the frame 8 in such a manner that when the said stud 5 hits one end of the lever 7 the other end swings the opposite way. This other end is connected by a hinged link 9 to a small radial arm 10 (Fig. 2) rigid with one of the pivots 4 of the tank 3, so that the latter is forced to tip over under the impulse of the pressure of the stud 5, the power involved in this being trifling. Figure 2 shows the tank 3 in its tipped position. A delivery

chute 12 is mounted between the tank 3 and the drum 1, such chute being adapted to guide the water which pours from the mouth of the tank 3 as the latter is rotated, so that the water is discharged into the open drum 1.

The tank 3 will be left reposing at an angle which allows it to discharge its contents completely whilst the drum 1 is charged with the solids and returned to its proper position (approximately at right angles to the position shown in Fig. 2) for the mixing operation by which time, or at any earlier stage, the water tank 3 will have been restored to its original upright or horizontal position as seen in Fig. 1. Should it be desired to add a little water after the mix has been effected the same tipping mechanism can be utilized in a limited degree by the operator tilting the drum back and thereby slightly tipping the tank 3 so as to cause some water to overflow. Whilst the mix is taking place in the drum 1, the water tank 3 can be recharged with water. The level of the water is perceivable through a gauge glass 13. If it is desirable, the water in the tank 3 can be measured by an independent method, or can be charged direct into the tank from the main pressure until the desired amount is again registered on the glass indicator plate 13. The supply of water can be fed through a pump from the existing water main through an overhead tank, or from some previously arranged measuring device.

Some of these alternative arrangements are illustrated in Figures 4, 5 and 6.

In Fig. 4, the lever 7^a is shown connected to an arm 14 controlling a cock 15 placed between the tank's outlet pipe 16 and the delivery chute 12 which in this form is equivalent to a nozzle. The tank 3^a may be kept supplied with water by the usual ball float 17 or in any other manner.

In Fig. 5 an external pull rod 18 is shown which in known manner lifts an internal plug valve 19 when the rod 18 is pulled, the connection between the lever 7^b and the rod 18 being made through levers 20 and 21, so that the pressure of the stud 5^b against the lever 7^b causes the latter to swing upon its pivot and thereby open the plug valve 19 and so cause the water to be discharged into the drum 1^b through the chute or nozzle 12^b. The stud 5^b shown in the other figures is replaced in Fig. 6 by a radial finger 22, and the pull rod 18^c for lifting the plug 19^c has a turned-up end 23 which is adapted to be engaged by the finger 22^c as the drum 1^c swings into its position for receiving its charge, the water being delivered through the nozzle 12^c in a similar manner to the previous arrangement, a ball float 17^c being shown in this case also.

Our invention is capable of further variation without departing from its essential feature, which is the provision of an automatic fluid delivery apparatus for use with concrete or other mixers.

We claim:

1. The combination of an oscillating mixing drum having an opening for the entry and discharge of material to be treated and means for supplying liquid to the drum through said opening comprising a member having a liquid outlet positioned to deliver liquid to said opening when by the oscillation of the drum said opening is brought opposite said outlet and means to control the supply of liquid to said outlet comprising an element connected with and moving with the drum in its oscillations and a movable element supported independently of the drum into contact with which said drum element is brought to move the same when said drum opening is presented in liquid-receiving position to said outlet.

2. A mechanism as in claim 1 in which the liquid outlet has a fixed position.

3. A mechanism as in claim 1 in which the cooperating elements of the liquid control are a lever and a stud connected with the drum, the lever having an arm in the path of movement of said stud.

4. The combination of an oscillating mixing drum, having an opening to receive material to be operated on, a source of supply of liquid, means to direct liquid from such source, to the drum opening when the latter by oscillation of the drum is brought contiguous thereto, and liquid flow control means comprising an element connected with and moving with the drum, and a movable element supported independently of the drum having a part in the path of movement of the drum connected element, into and out of contact with which the latter moves by the drum oscillation.

5. The combination of an oscillating mixing drum, having an opening to receive material to be operated on, a liquid holding tank with a liquid outlet mounted to swing in opposite directions to move such outlet to and from discharge position, said drum being movable to and from position to receive liquid coming from such outlet, and means to swing said tank in the direction to place its outlet in discharge position when the drum is moved into liquid receiving position.

6. The combination of an oscillating mixing drum, having an opening to receive material to be operated on, a liquid holding tank with a liquid outlet mounted to swing in opposite directions to move such outlet to and from discharge position, said drum being movable to and from position to receive liquid coming from such outlet, means to swing said tank in the direction to place

its outlet in discharge position when the drum is moved into liquid receiving position, comprising a stud carried by the drum and a lever connected with the tank and having an arm in the path of said stud.

7. The combination of an oscillating mixing drum, having an opening to receive material to be operated on, a liquid holding tank with a liquid outlet mounted to swing in opposite directions to move such outlet to and from discharge position, said drum being movable to and from position to receive liquid coming from such outlet, means to swing said tank in the direction to place its outlet in discharge position when the drum is moved into liquid receiving position, said tank swinging in the opposite direction by gravity.

In witness whereof we have signed this specification.

JOHN FAULDER BURN.
JOHN STUART LANCASTER.