Dec. 17, 1940. G. JAEGER 2,225,374

WATER-DISTRIBUTING SYSTEM FOR CONCRETE MIXERS

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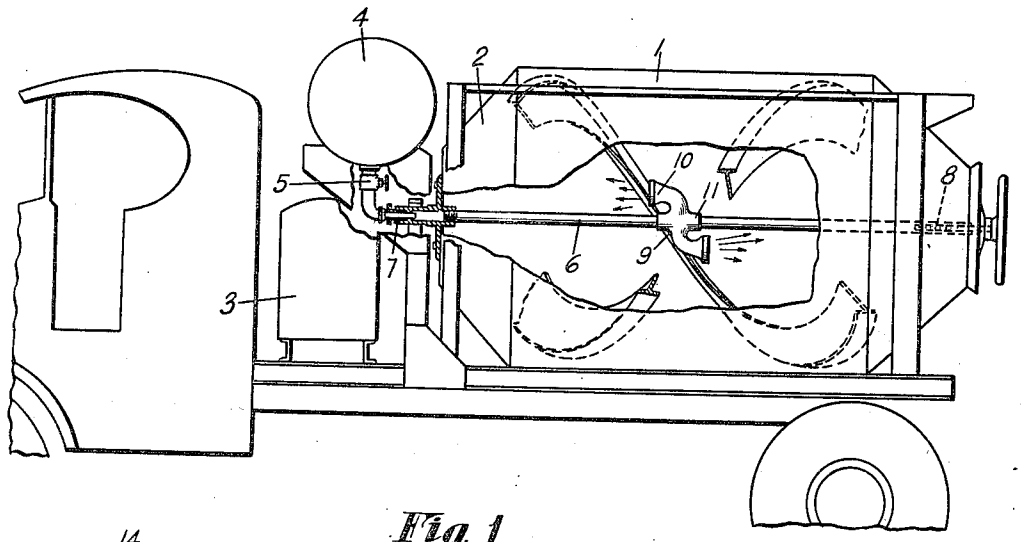


Fig. 1

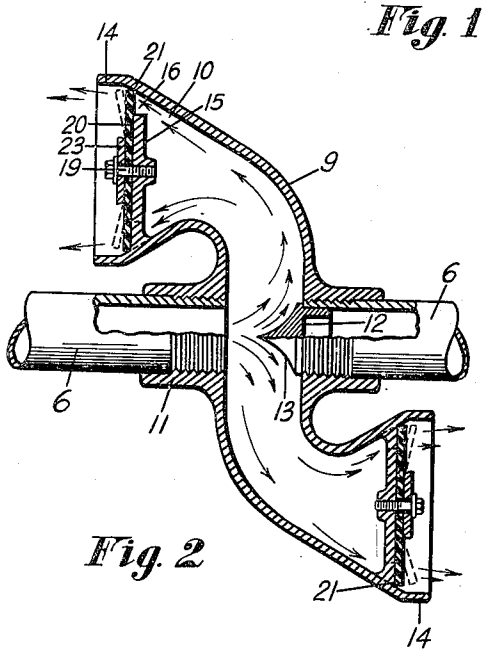


Fig. 2

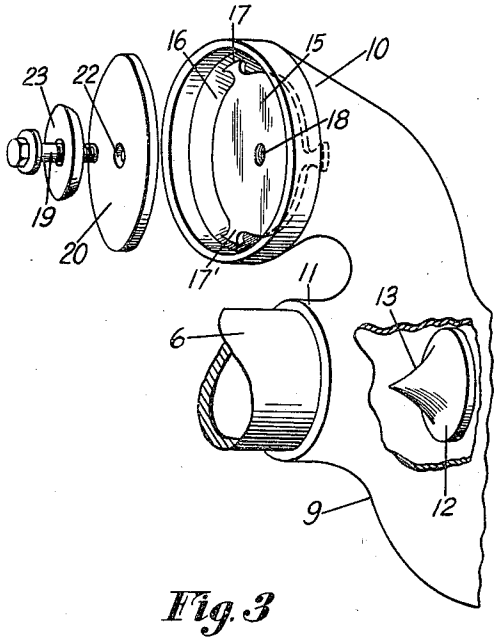


Fig. 3

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WATER-DISTRIBUTING SYSTEM FOR CONCRETE MIXERS

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5 Claims. (Cl. 259—168)

My invention relates to a water-distributing system for concrete mixers. It has to do, more particularly, with a water-distributing system adapted to be applied to the rotating drum of a concrete mixer, such as a truck mixer. However, it is to be understood that my invention is not necessarily limited to mixers for concrete but is applicable to mixers for other material and it is also not limited to the distribution of water in the mixer since it may be used for distributing other liquids.

One of the objects of my invention is to provide a water-distributing system which is particularly applicable to concrete mixers wherein the mixing drum rotates and which is of such a nature that it will distribute the water throughout the mixing drum very efficiently and uniformly.

Another object of my invention is to provide a water-distributing system of the type indicated which is of a very simple structure and which is of such a nature that it will efficiently discharge the water in the loaded mixing drum without danger of the material in the drum rendering the water-distributing device inoperative.

A further object of my invention is to provide a water-distributing system for mixing drums embodying a water-distributing bell disposed within the mixing drum which is of such a nature that it will readily and efficiently open when water is supplied thereto and will close and seal itself when the flow of water thereto is interrupted.

A still further object of my invention is to provide a water-distributing bell of the type indicated provided with a sealing diaphragm adapted to be actuated to open and close the bell, the diaphragm being so mounted that it may be quickly and easily removed and renewed with the removal and replacement of a minimum number of parts.

In its preferred form, my invention contemplates the provision of a water system which is associated with a rotating mixing drum, such as the rotating drum of a truck mixer. A water pipe is axially disposed within the mixing drum and is mounted so that it will rotate with the drum. On this axially disposed water pipe at a point preferably midway between the ends of the drum I dispose a single casting which has a pair of water-distributing bells formed thereon. This casting is so shaped that a water bell is formed on each end thereof and each bell is spaced radially from the axially disposed water pipe. The casting is so mounted on the pipe that it will rotate with the pipe which, as previously stated, will rotate with the drum. One of the water bells has its discharge outlet directed towards one end of the mixing drum while the bell on the opposite end of the casting has its discharge outlet directed towards the opposite end of the drum.

When the drum rotates, these water bells will travel in a circular path around the axis of the mixing drum and will direct the water towards opposite ends of the drum. This will insure that the water will be distributed uniformly throughout the mixing drum. The fact that the water bells are spaced from the axis of the mixing drum and travel in a circular path will enhance this water-distributing action. Each of the water bells is of novel construction, being such that it will readily open when water is supplied thereto and will readily close and seal itself when the supply of water thereto is interrupted, so as to prevent the entrance of concrete thereinto. Furthermore, each water bell is so constructed that the sealing means which takes the form of a flexible diaphragm can be removed and replaced easily and quickly by the removal and replacement of a minimum number of parts.

The preferred embodiment of my invention is illustrated in the accompanying drawing wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a side elevation, partly broken away, illustrating a truck mixer having a water-distributing system according to my invention associated therewith.

Figure 2 is a sectional view taken through the casting upon which the water bells are formed.

Figure 3 is a perspective view of a portion of the casting illustrating how the diaphragm may be readily removed from the bell.

With reference to the drawing, in Figure 1, I have shown my water-distributing system applied to a mixer for concrete of the truck mixer type. However, it is to be understood that my invention is not limited to this particular type of mixer.

The truck mixer is shown as comprising a mixing drum 1 which is mainly of cylindrical form but has frusto-conical ends 2. This mixing drum is rotatably mounted on the truck chassis in the usual way. It is driven by a power unit 3 to which it is connected in the usual manner. A water tank 4 is supported at a comparatively high point on the truck mixer and is adapted to supply water for distribution in the mixing drum under a gravity pressure. However, in some instances, it may be desirable to provide a pump for this pur-

pose. A valve 5 may be provided for controlling the flow of water from the tank.

Within the mixing drum, a water pipe 6 is axially disposed. This water pipe has both its forward and rear ends carried by the mixing drum in such a manner that the pipe will rotate with the mixing drum. The forward end of the pipe 6 is connected by means of a swiveled connection 7 to the outlet pipe leading from the water tank 4. The rear end of the pipe 6 may carry, as indicated at 8, means for controlling the opening and closing of the discharge door provided at the rear end of the mixing drum.

Substantially midway between the ends of the pipe 6, which is preferably made in two sections, I mount a casting 9. The casting 9 carries water-distributing bells 10 on opposite ends thereof. The casting is provided intermediate its ends with oppositely extending internally threaded bosses 11 adapted to receive the threaded ends of the pipe sections of the pipe 6. The forward section of the pipe 6 will be the only section through which water flows. The forward end of the rear section of the pipe 6 is closed by means of a plug 12. This plug 12 has a conical surface 13 which is adapted to direct the water laterally towards opposite ends of the casting as it enters the casting from the forward section of the pipe 6, as indicated in Figures 2 and 3.

The casting 9 is preferably of the shape shown, although it need not necessarily be of such shape. As previously indicated, the water-distributing bells 10 are formed on opposite ends of the casting. As indicated in the drawing, the outlet of one of the water-distributing bells is directed towards the forward end of the mixing drum while the outlet of the other water-distributing bell is directed towards the rear end of the mixing drum. Thus, the water will be simultaneously directed towards both ends of the mixing drum. It will be apparent that each of the water-distributing bells is spaced radially from the axis of the mixing drum. The water-distributing bells will rotate with the mixing drum and will travel in a circular path. Although I have shown two of these water-distributing bells formed on the casting, it is to be understood that any desired number may be formed thereon. Also, it is not necessary that all the bells be formed as a single unit. It is possible to have the bells separate and even have them disposed at spaced points along the pipe 6, although I prefer the construction illustrated in the drawing. Also, it is possible to have the water bells at a slight angle, if desired, so that they will direct the water towards the sides of the mixing drum while simultaneously directing it towards the ends thereof.

Each of the water bells 10 is preferably of the construction illustrated in the drawing. Each bell comprises a bell-shaped body portion having its wider end directed outwardly. It has an annular outwardly directed flange 14 on the outer edge thereof. Disposed within the outer end of the bell substantially at the point where the flange 14 starts, is an integral wall or disk member 15. Arcuate spaces 16 are formed between the edge of this disk 15 and the wall of the water bell and are separated at circumferentially spaced points 17 by means of the integral lugs 17' which join the disk 15 to the body portion of the casting. This disk 15 is provided with a centrally disposed threaded opening 18 adapted to receive a bolt 19. A flexible diaphragm 20 is adapted to rest against the outer surface of the disk 15. This diaphragm 20 is of such diameter that its outer edge will rest on the wall of the bell, as indicated at 21 in Figure 2. The diaphragm 20 is held in position on the member 15 by means of the bolt 19 which passes through a centrally disposed opening 22 in the member 20. A metal washer or disk 23, which is of considerably less diameter than the member 20, bears against the outer surface of the member 20 and aids in securing it in position. As indicated by the dotted lines in Figure 2, when water is supplied to the water bell, it will pass from the bell through the arcuate spaces 16 forcing the outer periphery of the flexible diaphragm outwardly, permitting the water to be discharged outwardly from the bell. However, as soon as the water pressure is interrupted, the flexible diaphragm will automatically return to its original condition, sealing the water bell so that there will be no danger of the material being mixed entering the bell.

The diaphragm 20 is preferably made of rubber, although it may be made of other material. Because of the manner in which it is mounted, it need not be extremely flexible and will, therefore, wear better. However, when it does wear to such an extent that it becomes necessary to replace it, it may be replaced easily and quickly. It is merely necessary to remove the bolt 19 and the washer 23, replace the diaphragm with a new one, and then replace the bolt and washer.

When the mixing drum is charged with material, it will lie in the bottom portion of the drum, usually filling substantially half of the drum. When the mixing drum is rotated, the pipe 6 will rotate therewith. Consequently, the water-distributing bells will also rotate therewith. These bells being radially spaced from the axis of the mixer will travel in a circular path. The water is supplied to these bells from the tank 4. It will pass into the casting 9 and will be directed in opposite directions by the surface 13 to the oppositely disposed water bells 10. When the water enters the bells, it unseats the diaphragm, allowing the water to flow from the bells. The water will be directed by one of the bells towards one end of the mixing drum and by the other of the bells towards the opposite end of the mixing drum. Because the water bells are spaced from the axis of the mixing drum and rotate through a circular path, they will more efficiently distribute the water. When one of the bells is in the material in the bottom of the mixing drum, the other bell will be out of the material. The moving water bells actually cut paths through the material being mixed and, consequently, the water can leave the bell even while it is passing through the material. Thus, with this arrangement, discharge of the water into the loaded drum can be accomplished quickly. As soon as the flow of water to the bell is interrupted, the diaphragm 20 will seat, effectively sealing the bells against entrance of material thereinto. However, in case any material ever does enter the bells, it can be readily flushed therefrom.

Although I have specified that the pipe 6 and the water bells rotate with the drum, my invention is not limited to a mixer wherein the drum rotates. It may be applied to a mixer where the drum does not rotate. In this instance, it would be desirable to have the water pipe 6 rotatably mounted in the drum so that the water-distributing bells would still trav-

el in a circular path within the drum. In fact some features of my invention can be used on a mixer where the water-distributing device does not rotate but the mixer drum does.

Many other advantages will be apparent from the preceding description, the drawing and the following claims.

Having thus described my invention, what I claim is:

1. Apparatus of the type described comprising a mixing drum, means for distributing water within the drum, said means comprising a water-supply pipe disposed axially within the drum, said mixing drum being mounted for rotation about its axis, said pipe being supported within the mixing drum for rotation therewith, a plurality of water-distributing members carried by said pipe, each of said members extending radially outwardly from said pipe and having an outlet portion spaced radially from said pipe and directed towards one end of the drum, the outlet portions of said members being oppositely directed so that water will be simultaneously supplied to both ends of the drum.

2. A water-distributing member for mixers or the like comprising a hollow body portion having a discharge end, a disk disposed at the discharge end and formed integral with the body portion, openings being provided in said disk adjacent the periphery thereof for permitting water to flow outwardly past said disk, a flexible diaphragm adapted to rest normally against said disk and to seal said openings, and means for securing said flexible diaphragm in position against said disk, said means comprising a member connected to said disk and bearing against the central portion only of said diaphragm.

3. A water-distributing member for mixers or the like comprising a hollow body portion having a discharge end, a disk disposed at the discharge end and formed integral with the body portion, openings being provided adjacent the periphery of said disk for permitting water to flow outwardly past said disk, a flexible diaphragm adapted to rest normally against said disk and to seal said openings, and means for securing said flexible diaphragm in position against said disk, said means comprising a removable member connected to said disk and bearing against the central portion only of said diaphragm.

4. In a mixer, a rotatable drum, a fluid supply system therefor comprising an eccentrically positioned discharge terminal within the drum and mounted for rotation therewith and pipe connections for conducting water from a source of supply to said discharge terminal comprising a central supply pipe and a branch pipe leading from the central supply pipe to said terminal whereby said central supply pipe will swing said discharge terminal and said branch pipe downwardly in an arc during a portion of the rotation of the drum so that any head of liquid available at the central supply pipe for causing discharge will be increased during the movement of the discharge terminal through that portion of the batch in the lower half of the drum.

5. In a mixer, a rotatable drum, a fluid supply system therefor comprising an eccentrically positioned discharge terminal within the drum and mounted for rotation therewith, said terminal being disposed at an angle so that it will direct the water towards the side wall of the drum, and pipe connections for conducting water from a source of supply to said discharge terminal comprising a central supply pipe and a branch pipe leading from the central supply pipe to said terminal whereby said central supply pipe will swing said discharge terminal and said branch pipe downwardly in an arc during a portion of the rotation of the drum so that any head of liquid available at the central supply pipe for causing discharge will be increased during the movement of the discharge terminal through that portion of the batch in the lower half of the drum.

GEBHARD JAEGER.