Oct. 17, 1950 H. C. VON SASPE 2,526,520

WATER TANK FOR CONCRETE MIXER, WITH MIXING-WATER AND FLUSHING-WATER COMPARTMENTS, AND A DISCHARGE VALVE FOR EACH COMPARTMENT

Filed April 10, 1945 4 Sheets-Sheet 1

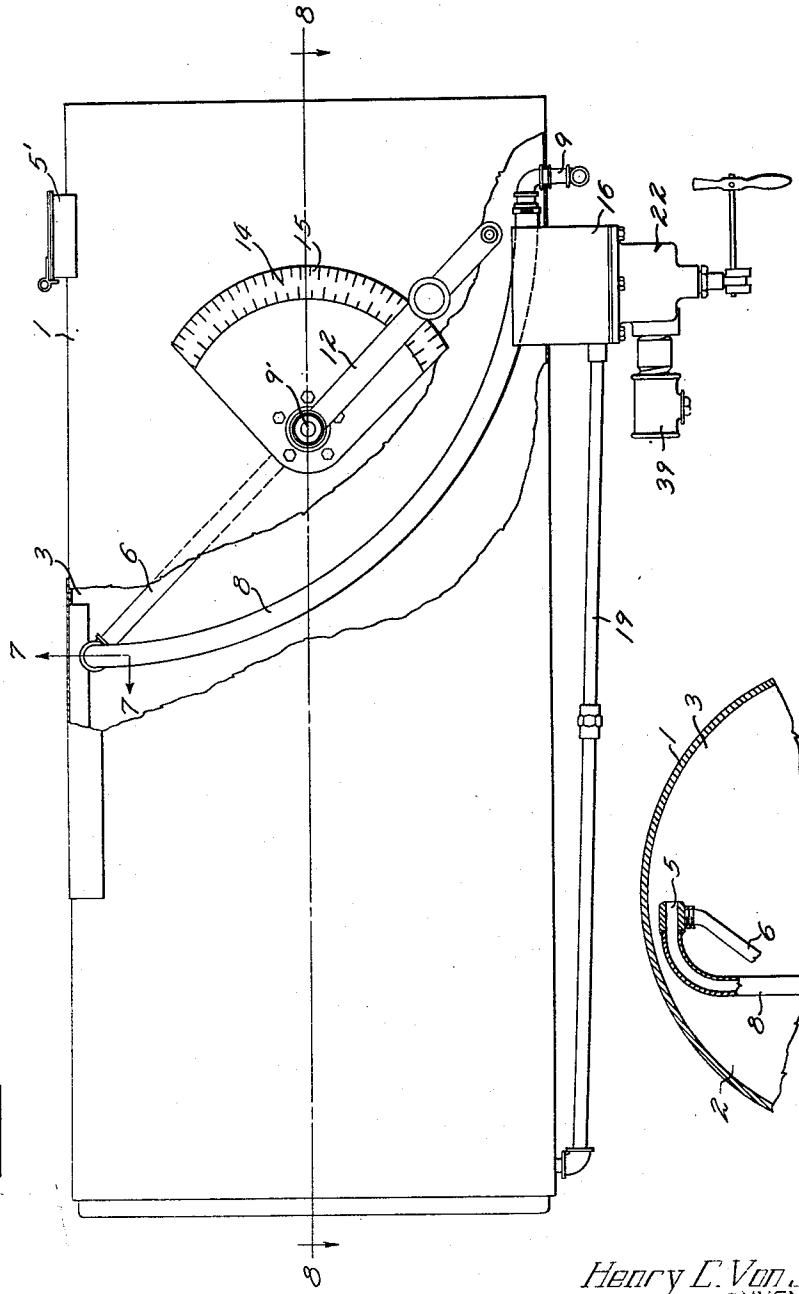


FIG. 1

FIG. 7

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Filed April 10, 1945 4 Sheets-Sheet 2

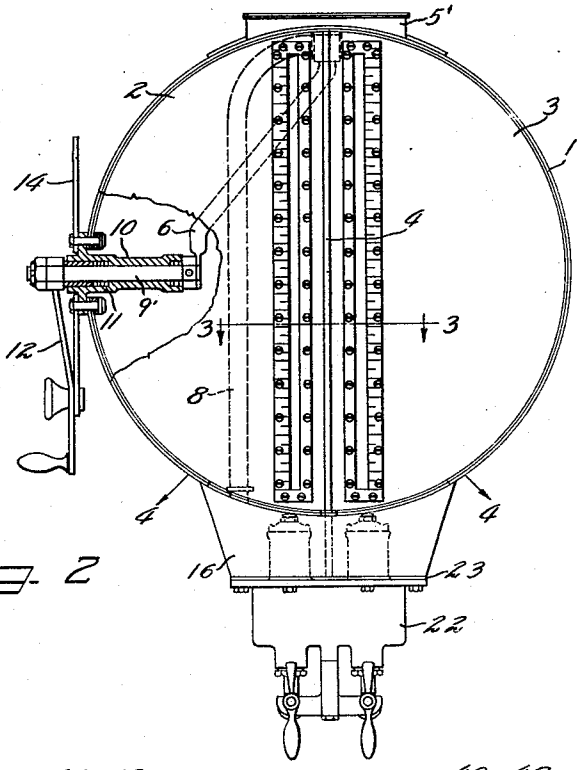


FIG. 2

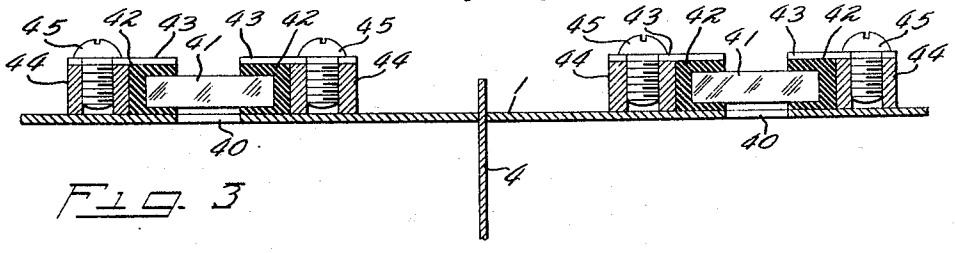


FIG. 3

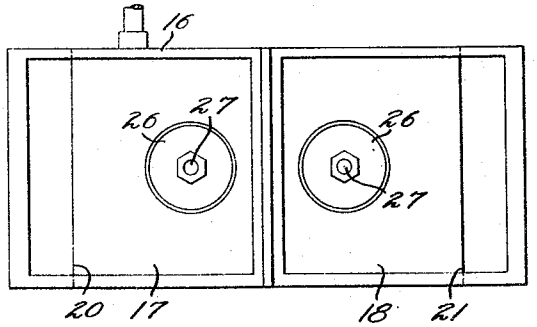


FIG. 4

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FIG. 6

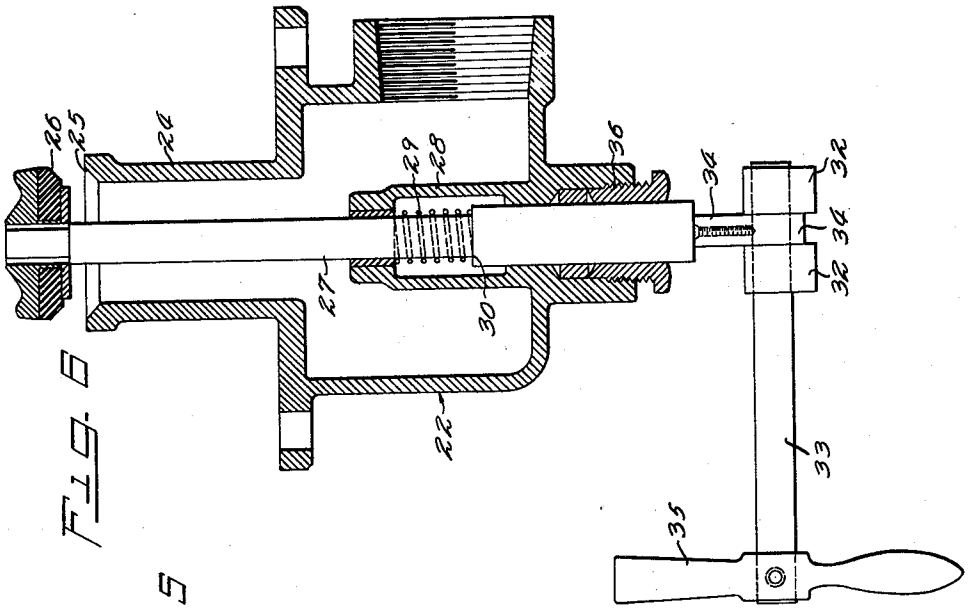
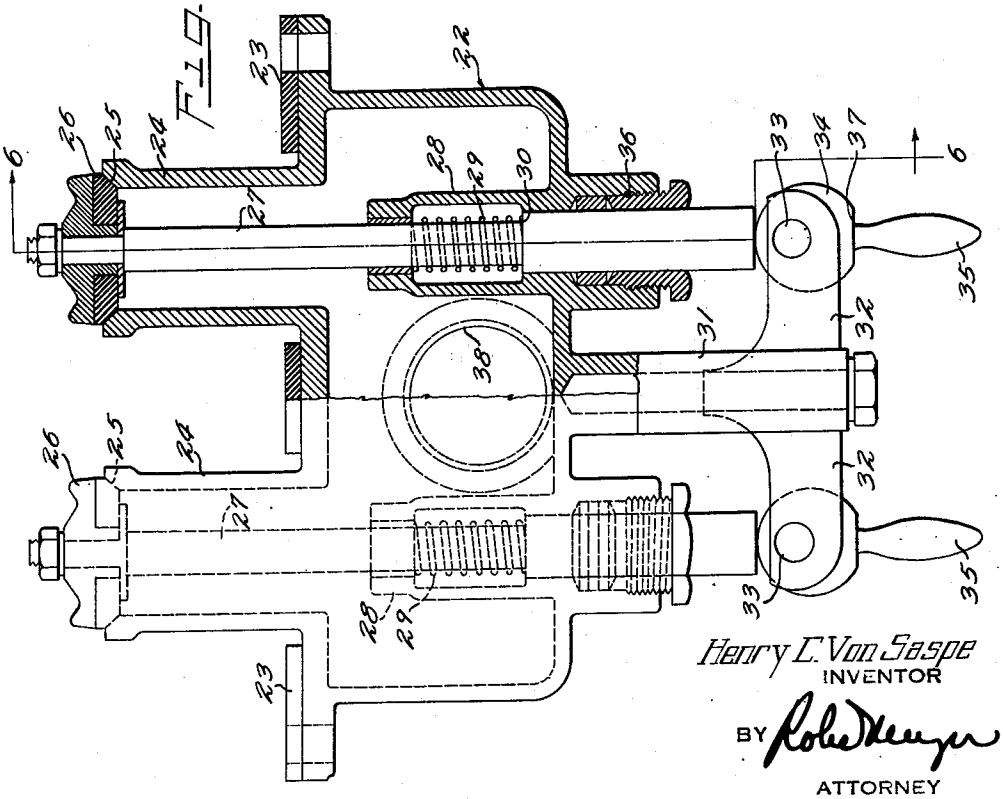


FIG. 5



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Oct. 17, 1950 H. C. VON SASPE 2,526,520

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Filed April 10, 1945 4 Sheets-Sheet 4

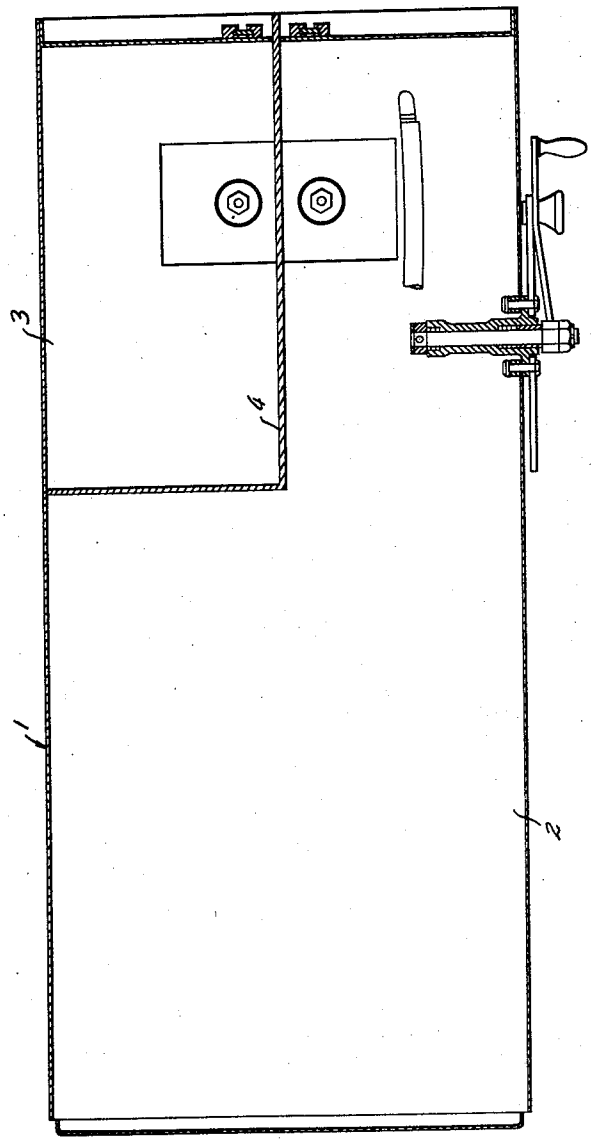


FIG. 8

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Patented Oct. 17, 1950 2,526,520

UNITED STATES PATENT OFFICE

2,526,520

WATER TANK FOR CONCRETE MIXER, WITH MIXING-WATER AND FLUSHING-WATER COMPARTMENTS, AND A DISCHARGE VALVE FOR EACH COMPARTMENT

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Application April 10, 1945, Serial No. 587,528

8 Claims. (Cl. 222—145)

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This invention relates to concrete mixers, and more particularly to a water tank for use in connection with such mixers.

An object of the invention is to provide a water tank structure which embodies a novel type of means whereby a quantity of water in the tank may be easily regulated to a definite predetermined quantity so as always to have the exact amount of water available for the particular mix of the batch of concrete being mixed.

Another object of the invention is to provide a novel type of water dispensing valves so constructed and arranged as to prevent freezing of the valves and the consequent interference with accuracy when using the device in cold weather.

Since concrete mixers usually travel over rough terrain near construction jobs, another object of the present invention is to provide means to maintain accuracy of the measuring device over a nominal slope of the mixer in any direction.

With these and other objects in view, as may appear from the accompanying specification, the invention consists of various features of construction and combination of parts, which will be first described in connection with the accompanying drawings, showing a water tank for concrete mixer, with mixing-water and flushing-water compartments, and a discharge valve for each compartment of a preferred form embodying the invention, and the features forming the invention will be specifically pointed out in the claims.

In the drawings:

Figure 1 is a side elevation of the improved water tank having a part thereof broken away.

Figure 2 is an end view of the improved water tank having a part thereof broken away and showing parts in section.

Figure 3 is a detail section through the tank taken on the line 3—3 of Figure 2 and showing the gauge glass structure.

Figure 4 is a detail view taken on the line 4—4 of Figure 2 and showing the top of the distributing chambers of the tank.

Figure 5 is a view partly in side elevation and partly in section of the improved anti-freeze distributing valve structure.

Figure 6 is a sectional view through the valve structure taken on the line 6—6 of Figure 5.

Figure 7 is a detail sectional view through a part of the tank structure taken on the line 7—7 of Figure 1.

Figure 8 is a longitudinal section through the tank taken on line 8—8 of Figure 1.

Referring more particularly to the drawings, the improved water tank structure includes a

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tank 1 which may be cylindrical in shape or any other desired shape. The tank 1 is divided into two compartments 2, and 3 by a vertical partition 4 in the tank. One of these compartments, namely, the compartment 2 is provided for containing water to be mixed with the cement, sand, and other material to provide the proper concrete mix in the concrete mixer (not shown) with which the tank is associated, while the other compartment, namely, the compartment 3 is provided for containing a quantity of water for use in flushing or washing out the concrete mixer after the mix of concrete has been removed therefrom.

The tank 1 has a water inlet 5' which communicates with both compartments 2 and 3 and by means of which these compartments may be filled with water.

It is a well known fact that in mixing concrete mixes for different uses as well as in different quantities in a concrete mixer, predetermined quantities of water are required in proportion to the other ingredients of the mix to provide the desired mixture. Heretofore there have been various types of apparatus for regulating the quantity of water delivered to the mix, such as, for instance, telescoping pipes which are adjusted to different levels in the tank to provide for the outflow of substantially predetermined quantities. Such devices are impractical in actual use because, first, they are generally so located that the operator has difficulty in reaching them for adjustment and must put his hands through moving mechanical parts to reach them. This is dangerous and often results in accidents, then also the pipes become foul, causing them to stick and prevent proper adjustment.

The present invention provides a simple, novel type of means for providing a predetermined quantity of water in the compartment 2, which means is easily and accurately adjusted from the exterior of the tank so as to provide a predetermined quantity of water in the tank and prevent either an excess or insufficient quantity of water from being delivered to the concrete mixer. This means comprises an inlet coupling 5 which is carried by a swinging arm 6. The coupling 5 has one end open into the compartment 2, as clearly shown in Figure 7 of the drawings, so as to allow water to flow into the coupling. A flexible hose 8 is connected to the opposite end of the inlet coupling 5 and extends downwardly through the tank to an outlet coupling 9 at the bottom of the tank.

The arm 6 is connected to a stub shaft 9' which

is rotatably carried by a suitable enclosing bearing housing 10. The shaft 9' projects outwardly of the tank 1 through a packed joint 11, and it has an operating handle 12 mounted on its outer end. The lever 12 co-operates with a quadrant scale 14 carried by the tank 1. The scale 14 is graduated, as shown at 15, to indicate various gallonage quantities representing various contents of the compartment 2 of the tank corresponding to the position of the inlet coupling 5. When it is desired to have a predetermined definite gallonage of water for the mix, the lever 12 is moved to the indicated gallonage on the quadrant scale 14 which moves the inlet coupling 5 to a predetermined position within the compartment 2 corresponding to the indicated gallonage content of the compartment. After this adjustment is made, water is introduced into the compartment 2 through the inlet 5'; and when the level of the water in the compartment 2 reaches the inlet coupling 5, the water will begin to flow through the inlet coupling 5 and hose 8 outwardly through the outlet coupling 9, so that any water delivered to the tank in excess of the gallonage indicated by the quadrant scale will overflow from the compartment 2 through the outlet. Thus, only the required quantity of water is carried in the compartment 2 for delivery to the concrete mixer.

Inasmuch as only the required quantity of water for mixture with the solid ingredients of the cement is admitted to the tank, it is essential that it all be delivered to the concrete mixer. To accomplish this when the tank is inclined at a nominal slope the compartment 2 has a dispensing chamber 16 at one end and an auxiliary drain pipe 19 at the other end. This dispensing chamber 16 is divided into two compartments 17 and 18, one of which communicates with the compartment 2 in the tank, while the other communicates with the compartment 3. The compartment 17 which communicates with the compartment 2 has the auxiliary drain pipe 19 connected thereto which is connected to the bottom of the compartment 2 of the tank 1 at the end of the tank remote to the end near which the dispensing chamber 16 is located. This pipe 19 inclines slightly from its connection from the end of compartment 2 towards compartment 17 so as to provide a leveling flow of water into the compartment 17. The compartment 17 has a relatively large opening 20 in its top which opens directly into the compartment 2, while the compartment 18 has a relatively large opening in its top which opens directly into the flushing compartment 3.

A novel type of valve structure, as shown in Figures 5 and 6 of the drawings, is provided for dispensing the water from the compartments 17 and 18.

The valve structure 22 comprises a housing which is attached in any suitable manner by such as a gasket joint 23 to the bottom of the housing forming the dispensing chamber 16. The housing 22 of the valve structure has two cylindrical upwardly extending extensions 24, one of which extends into the compartment 17, while the other extends upwardly into the chamber 18; and dispensing valves are provided for independently dispensing the water from these two compartments. The valves are identical in construction, and consequently only one of them will be described.

The cylindrical extension 24 has an internal valvet seat 25 formed upon its upper end against

which a mushroom type valve member 26 seats to cut off the flow of water from the compartment 17 or 18 into the valve housing 22. The mushroom-type valve 26 is constructed and designed so as to prevent foreign matter such as small rocks or the like from accumulating on its top and from flowing into the valve housing 22 causing such foreign matter to settle or fall into the bottom part of the compartment 17 or 18 in which the valve is positioned. Such foreign matter may be flushed from the compartment periodically as required. A valve stem 27 is connected to the valve 26 and extends downwardly through the housing 22 and through a cylindrical extension 28 which extends upwardly into the housing from the bottom thereof. A tensioned spring 29 is mounted in the cylindrical extension 28 and engages against a shoulder 30 formed on the valve stem and against the inner upper end of the cylindrical extension 28. The spring 29 acts to hold the valve 26 on its seat 25. A supporting bracket 31 is carried by the valve housing 22 and has laterally extending arms 32 thereon, each of which carries a rotatable shaft 33. A cam 34 is mounted on the shaft 33 and it is manually rotated through the medium of the shaft 33 by a handle 35. The cam 34 engages the lower end of the valve stem 27 which projects out of the valve housing 22 through a packed gland 36, and the spring 29 serves to hold the outer end of the valve stem in engagement with the perimeter of the cam 34. The cam is rotated to move the valve 26 off its seat 25 to open the valve and permit water to flow into the valve housing 22. The cam has a flat surface 37 thereon so that when the valve 26 is moved to its maximum open position the flat surface 37 will engage the bottom of the valve stem 27, and the spring 29 urging the stem against this flat surface will cause a locking action to prevent accidental closing of the valve or vibration of the valve during the dispensing of the water from either the compartment 2 or 3.

The valve housing 22 has a single outlet 38 which opens into a suitable coupling 39 which in turn is connected by any suitable means to the interior of the concrete mixer (not shown). Thus then the valve 26, which is in communication with the compartment 17, is open all of the pre-measured quantity of water in the compartment 2 may be delivered to the concrete mixer. After the concrete mix has been removed from the concrete mixer, this valve 26 is closed, and the valve 26 which communicates with the compartment 18 is opened to allow the flushing water to flow from the compartment 3 into the concrete mixer (not shown) for flushing or cleaning the concrete mixer. The provision of the cylindrical extensions 24, and the positioning of the valves 26 in the center of the compartment 17 and 18 upwardly from the bottom of the compartment will prevent freezing of the valves, unless the entire water content of the compartment 17 and 18 is frozen solid which very rarely, if ever, occurs, and thus the valves are protected from freezing with the resultant undesirable features when mixing concrete in cold weather.

For the purpose of determining the quantities of water in the compartments 2 and 3, a novel type of gauge glass is provided which is clearly shown in Figures 2 and 3 of the drawings. One end of the tank 1 is provided with a pair of slots 40, one on each side of the compartment 4. These slots extend approximately the entire height of the tank. Transparent gauge glasses

41 are outside the end of the tank and in alignment with the slots 40 so that the quantity of water in the compartments may be viewed through the gauge glass. The gauge glasses 41 are flat and rectangular, and they have their edges seated in rubber gaskets 42 which are held flat and tightly against the end of the tank 1 by clamping plates 43. The clamping plates 43 are attached to attaching strips 44 which may be welded or otherwise rigidly attached to the end of the tank, one on each side of each of the slots 40 by means of suitable clamping bolts 45. Thus flat sight gauges are provided which project only a short distance outwardly from the ends of the tank, and which gauge glasses are protected from falling stones, foreign matter, or branches of trees while the concrete mixer is in transit by means of both their flat construction and the provision of the clamping plates and attaching strips, and also by the projecting portion of the tank shell, as clearly shown in Figure 8 of the drawings. Also these gauge glasses are free from the inaccurate readings and disadvantages caused by the usual type of cylindrical gauge glass commonly in use in that they are not subject to the freezing of the water contents of the cylindrical glasses, and they are also not subject to breakage as are the cylindrical glasses.

Owing to the quantity regulating mechanism including the inlet coupling 5 and overflow hose 8, care need not be taken when filling the compartments 2 and 3 from the single inlet 5, as any surplus water which might splash over into the compartment 2, either during filling or during travel of the mixer, will be discharged from the compartment 2, leaving only the desired measured quantity of water in compartment 2. Also, any water lost through the overflow outlet due to splash while the concrete mixer is traveling will be compensated for by splash entering the compartment 2 from the flush or wash water compartment 3.

It will be understood that the invention is not to be limited to the specific construction or arrangement of parts shown, but that they may be widely modified within the invention defined by the claims.

What is claimed is:

1. In a water tank structure for concrete mixers, a water-containing tank, quantity regulating means for regulating the quantity of water contained in the tank including an overflow outlet member, a pivoted arm in the tank and connected to the overflow outlet member for varying the position of the overflow outlet member to regulate the quantity of water in the tank, an operating arm carried by the tank and outside thereof, said operating arm connected to said pivoted arm for moving the overflow outlet member to various elevations within the tank to regulate the gallonage content of the tank, a flexible hose connected to said overflow outlet member and to an outlet in the tank to carry off any surplus water above the gallonage predetermined by the setting of the overflow outlet member, a box forming an outlet chamber opening into the tank and connected to the lowermost part of the tank near one end thereof, and an auxiliary drain pipe connected to said outlet chamber and to the lowermost part of the tank at the end remote from the outlet chamber.

2. In a water tank structure for concrete mixers, a water-containing tank, quantity regulating means for regulating the quantity of water contained in the tank, adjustable means for setting

said regulating means to predetermine the quantity of water in the tank, a box forming an outlet chamber opening into the tank and connected to the lowermost part of the tank near one end thereof, an auxiliary drain pipe connected to said outlet chamber and to the lowermost part of the tank at the end remote from said outlet chamber, a valve housing connected to said outlet chamber and having an outlet opening, a valve for controlling flow of water through said outlet opening, said valve being an upwardly opening valve positioned well above the bottom of the outlet chamber to prevent foreign material flowing from the chamber with the water.

3. In a water tank structure for concrete mixers, a water-containing tank, quantity regulating means for regulating the quantity of water contained in the tank, adjustable means for setting said regulating means to predetermine the quantity of water in the tank, a box forming an outlet chamber opening into the tank and connected to the lowermost part of the tank near one end thereof, an auxiliary drain pipe connected to said outlet chamber and to the lowermost part of the tank at the end remote from said outlet chamber, a valve housing connected to said outlet chamber and having an outlet opening, a valve for controlling flow of water through said outlet opening, said valve being an upwardly opening valve positioned well above the bottom of the outlet chamber to prevent foreign material flowing from the chamber with the water, a valve stem, a cam engaging said stem for opening said valve, a spring for closing said valve, and locking means on said cam and co-operating with said stem for holding said valve in open position.

4. In a water tank structure for concrete mixers, a water-containing tank, quantity regulating means for regulating the quantity of water contained in the tank including an overflow outlet member, a pivoted arm in the tank and connected to the overflow outlet member for varying the position of the overflow outlet member to regulate the quantity of water in the tank, an operating arm carried by the tank and outside thereof, said operating arm connected to said pivoted arm for moving the overflow outlet member to various elevations within the tank to regulate the gallonage content of the tank, a flexible hose connected to said overflow outlet member and to an outlet in the tank to carry off any surplus water above the gallonage predetermined by the setting of the overflow outlet member, a box forming an outlet chamber opening into the tank and connected to the lowermost part of the tank near one end thereof, an auxiliary drain pipe connected to said outlet chamber and to the lowermost part of the tank at the end remote from the outlet chamber, a valve housing connected to said outlet chamber and having an outlet opening, a valve for controlling flow of water through said outlet opening, said valve being an upwardly opening valve positioned well above the bottom of the outlet chamber to prevent foreign material flowing from the chamber with the water.

5. In a water tank structure for concrete mixers, a water-containing tank, quantity regulating means for regulating the quantity of water contained in the tank, outlet means for said tank including, a box forming an outlet chamber connected to the lowermost part of said tank, a valve housing attached to said box and having a cylindrical extension projecting upwardly into the outlet chamber, an internal valve seat formed

on the upper end of said cylindrical extension, a valve for co-operating with said internal valve seat, a valve stem connected to said valve and extending through and outwardly of said valve housing, said valve housing having an outlet, a rotary cam supported by the housing outwardly thereof and engaging the outwardly projecting end of the valve stem, a spring engaging the valve stem for holding the valve seated, said cam being rotatable to open the valve, and a flat surface on the cam co-operating with the projecting end of the valve stem and with said spring to lock said valve in open position.

6. In a water tank structure for concrete mixers having a main compartment for mix water and a wash compartment for wash water, outlet means for said main compartment and said wash compartment, said means including a box forming an outlet chamber having two outlet compartments, one of the outlet compartments communicating with said main compartment and one communicating with said wash compartment, a valve housing attached to said box and having hollow extensions projecting upwardly into each of the outlet compartments, internal valve seats formed on the upper end of said extensions, valves for cooperating with said valve seats, said valves opening into a common chamber within the housing having an outlet, said housing having extensions projecting into said last mentioned chamber, valve stems connected to the valves and extending through said last mentioned extensions to the outside of the housing springs cooperating with flanges on said stems and shoulders in said extensions to urge the valves to the closed position, rotary cams supported by the housing outwardly thereof and engaging the outwardly projecting ends of the valve stems, said cams being rotatable to open the valves, flat surfaces on said cams cooperating with the projecting end of the valve stem and with said spring to lock said valves in the open position, and means for rotating said cams individually.

7. In a water tank structure for concrete mixers, a water tank having a partition therein to form a mixing-water containing compartment and a wash-water containing compartment, a dispensing chamber attached to the bottom of said water tank and provided with a partition therein forming dispensing chambers open constantly one to said mixing water containing compartment and the other to said wash-water containing compartment, a dispensing valve housing attached to said dispensing chamber and having an inlet for each of said compartments in said dispensing chamber and a common outlet, inlet extensions formed on said valve housing and extending upwardly into the dispensing housing an operable distance above the bottom of the dispensing chamber, and valves carried by said valve housing for controlling flow of water from said dispensing housing compartments into said valve housing.

8. In a water tank structure for concrete mixers, a water tank having a partition therein to form a mixing-water containing compartment and a wash-water containing compartment, a dispensing chamber attached to the bottom of said water tank and provided with a partition therein forming dispensing chambers open constantly one to said mixing-water containing compartment and the other to said wash-water containing compartment, a dispensing valve housing attached to said dispensing chamber and having an inlet for each of said compartments in said dispensing chamber and a common outlet, inlet extensions formed on said valve housing and extending upwardly into the dispensing housing an appreciable distance above the bottom of the dispensing chamber, valve seats formed on the inner ends of said inlet extensions, valves for seating on said valve seats, and means for moving said valves off of or on to said valve seats for controlling the flow of water from said compartments in the dispensing chamber into said valve housing.

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