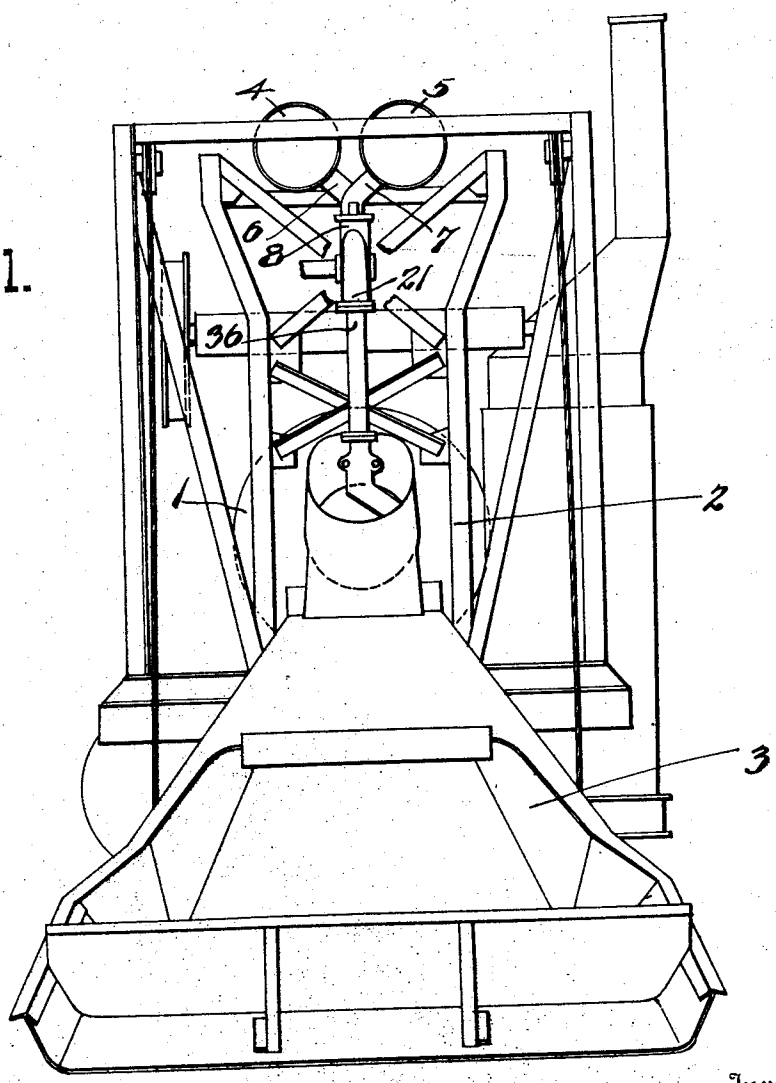
Aug. 7, 1928. 1,679,614

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MULTIPLE TANK WATER SUPPLY MECHANISM

Original Filed July 27, 1925 2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

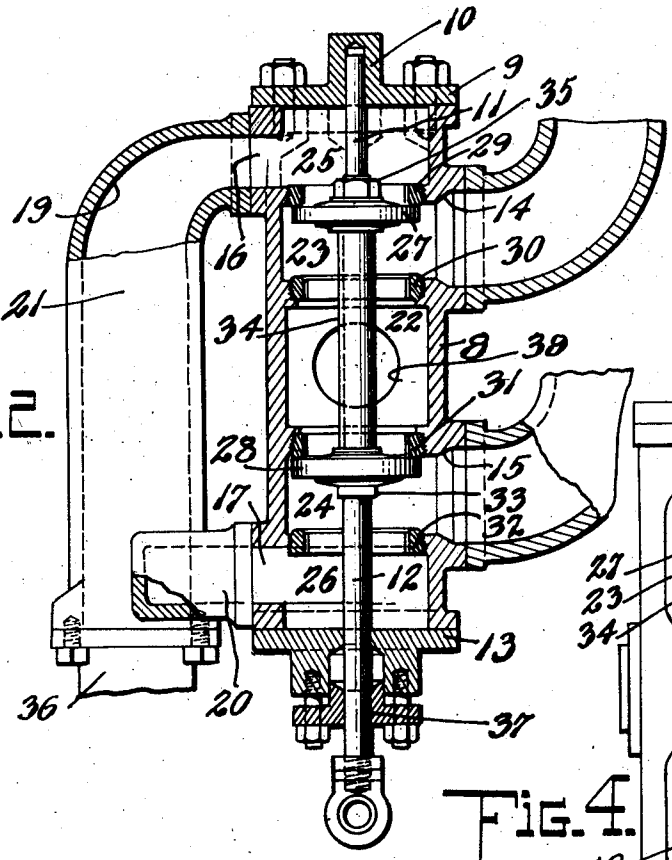


Fig. 4.

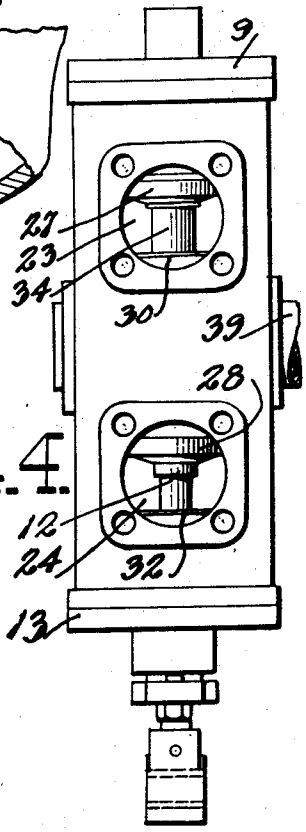
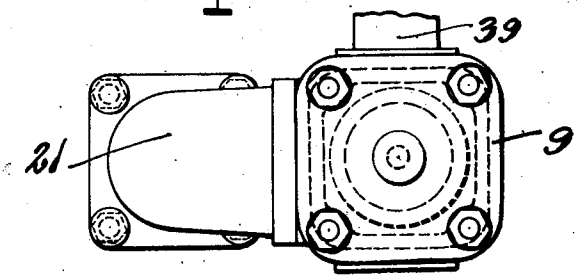


Fig. 3.



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UNITED STATES PATENT OFFICE.

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MULTIPLE-TANK WATER-SUPPLY MECHANISM.

Application filed July 27, 1925, Serial No. 46,313. Renewed October 14, 1927.

This invention embodies novel water supply means for concrete mixers. The equipment provided in accordance with the invention involves the use of multiple tank means or a plurality of water compartments, each adapted to furnish a measured quantity of water for a batch of solid aggregates supplied to a mixer. A primary object of the invention is to employ a peculiar valve device forming a part of the valve mechanism of the invention, the said valve mechanism being interposed between the multiple supply tank means and an outflow pipe which leads to the mixer and is common to said multiple tank means.

The novel design of the valves used is especially advantageous for causing less wear, and therefore renewals of valves are reduced materially, promoting the long life of the valve apparatus in a manner which will appear more fully hereinafter. A further object of the invention has been to produce an arrangement of valves whereby the pressure of the water from the main supply water line will act upon the valves with counterbalancing effects so that it is never necessary to adjust the valve means against the full pressure entering the valve casing from the main water line.

A further object of the invention resides in certain provisions made for facilitating the removal and renewal of the valve means, when after long use occasion may arise for such operation.

With the foregoing and other objects in view, a full understanding of this invention will be had upon reference to the following description in conjunction with the accompanying drawings, in the latter of which:

Figure 1 is a sort of diagrammatical view showing the adaptation of the invention to its use in connection with concrete mixing machines.

Figure 2 is a vertical sectional view taken through the valve casing and adjacent pipe connections.

Figure 3 is a top plan view of the same.

Figure 4 is a view looking toward the valve casing from the side thereof at which the water tank connecting pipes are arranged.

Referring to the drawings, the mixing machine diagrammatically illustrated involves the mixing drum 1 supported on a suitable frame 2 and adapted to be charged with solid aggregates by means of a loading skip 3, these parts being of conventional construction now in use and need not be described in detail.

At suitable points on the frame 2 of the machine, preferably near its upper portion, are located water measuring tanks 4 and 5. These measuring tanks 4 and 5 may each be equipped with water measuring appliances for measuring a predetermined quantity of water of sufficient amount necessary for admixture with a batch of solid aggregates that may be charged into the drum 1. The measuring means may be of any conventional type, and does not form a part of the present invention itself. In this connection reference is had to a typical measuring tank construction such as may be utilized, the same being shown in United States Letters Patent of Koehring Patent No. 1,149,922, issued August 10, 1915.

The water tanks 4 and 5 are respectively equipped with water outflow pipes 6 and 7. The pipes 6 and 7 lead downwardly from the tanks 4 and 5 to a valve casing 8 of peculiar construction. The said casing 8 is provided with a top plate 9 bolted or otherwise attached thereto, to close its upper end, and formed with a guide member 10 cooperative with a guide stem 11 at the upper end of a valve rod 12 which operates within the casing 8 but passes through a bottom closure plate 13 at the lower extremity of said casing. The valve rod 12 may be connected to be manually operated, or under certain conditions may be operated by the skip 3, in order to shift the valve means on said rod up and down for purposes made more clear hereinafter. The valve casing 8 has inflow ports 14 and 15 with which, respectively, the pipes 6 and 7 are connected. The inflow ports 14 and 15 are spaced a short distance from the ends of the casing 8, being closer together than are the outflow ports 16 and 17 which are preferably located on the casing 8 at the side opposite the ports 14 and 15. Said ports 16 and 17 are respectively near the upper and lower ends of the casing and a manifold member 19 leads downwardly from the port 16, having a coupling extension 20 with the port 17 and forming an outflow passage 21 which conducts water from the valve casing 8 to the mixing drum 1 of the mixing machine. The

valve casing 8 is provided with a central water supply chamber 22, adjacent inflow chambers 23 and 24 and end outflow chambers 25 and 26. The said various chambers are so located as to be connected up or separated from one another by means of valves 27 and 28 which operate reciprocally within the casing 8. The valve 27 is movable between an upper valve seat 29 and a lower valve seat 30, said valve seats being located at opposite ends of the upper inflow chamber 23. The valve 28 is adapted to reciprocate between valve seats 31 and 32 which are located at opposite ends, so to speak, of the inflow chamber 24. The said valves 27 and 28 are of a larger diameter, of course, than are their valve seats for which reason to facilitate introduction and removal of the valves in respect to the casing 8, the various seats 29, 30, 31 and 32 are made removable. Each seat is preferably comprised of an annular body screwed into a threaded opening formed in the annular wall of the casing 8.

The valves 27 and 28 are of like constructions. Each valve is made up of a body disc or discs removably fitted upon the valve rod 12 by the provision of a shoulder 33 on the rod 12, having an abutting relation with the bottom of the valve 28. A sleeve 34 is mounted upon the rod 12 with its lower end abutting against the upper side of the valve 28 and its upper end cooperating with the underside of the valve 27. Above the valve 27 there is screwed upon the rod 12 a clamping nut 35 which nut firmly holds the valves 27 and 28, and their cooperating abutting parts just described in proper assembled positions upon the rod 12. Removal of the valves 27 and 28 may be effected by detaching the lower plate 13 of the casing 8, unscrewing the valve seats 30, 31 and 32, and displacing the valve rod with said valves thereon, through the lower end of the casing 8.

The lower end of the manifold 19 providing the outflow passage 21 is connected with a pipe 36 by which the water entering the passage 21 may be conducted to the mixing drum 1. Or, the said manifold 19 may be of sufficient length to lead directly into the mixing drum. The foregoing is immaterial in the purview of the invention. A stuffing box 37 may be provided in the lower closure plate 13 of the casing 8.

At one side of the central water supply chamber 22 is provided a water supply port 38 with which is connected a pipe 39 leading from the main water supply line availed of to provide a water supply to the mixing machine. The water enters the chamber 22 through the port 38 and pipe 39 at varying pressures dependent upon that of the supply line. Obviously the water so far as it acts upon the valves 27 and 28 produces thereagainst substantially counterbalanced forces because the pressure areas of the valves upon which the water effectively acts are the same until the valves are seated one way or the other, whereupon the pressure acting to hold the valve in its seated position is somewhat greater than that acting to unseat it. Throughout the movement of the valve means therefore, the water pressure entering at the water port 38 acts with equal forces upon the valves 27 and 28, under which conditions there is produced a comparative ease of the operation of the valve rod 12 under practical conditions of use.

In the operation of the invention, and bearing in mind that the tanks 4 and 5 might be a single tank structure divided into two water compartments, it will be apparent that when the valves 27 and 28 are arranged in the positions of Figure 2, the water is passing from the tank 5 through the pipe 7, through the water inflow chamber 24 to the outflow port 17 and through the extension 20, passage 21 and pipe 36 to the mixing drum. In this way a measured quantity of water is conducted from the tank 5 to the drum and while the above operation takes place, the water supply chamber 22 is connected with the inflow chamber 23, the pipe 6 and tank 4 so that the tank 4 is being refilled or has been filled owing to the connection thereof with the main water line supply pipe 39. Let us suppose that the valve rod 12 is pulled downwardly to seat the valve 27 against the seat 30 and the valve 28 against the seat 32. Then the water will flow from the tank 4 through the chamber 23 up to the chamber 25, out through the passage 21, down through the pipe 36 to the mixing drum. At this time, of course, the supply line port 38 is cut off from the tank 4 and pipe 6, but at this time also, the water supply chamber 22 is in communication with the chamber 24, pipe 7 and the tank 5 and is refilling or has refilled said tank 5 in an obvious manner.

When the valve 27 is in the position of Figure 2, it is obvious that the water from the main supply line cannot enter the tank 5 because the valve 28 is seated against the seat 31 and cuts off the supply of water in the chamber 22 from the tank 5.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:

1. In water supply means for concrete mixing machines, in combination, a valve casing comprising a central water supply chamber to receive some water from a main water supply line, valves arranged in said casing at opposite ends of said chamber, valve seats in said casing arranged in pairs at opposite ends of said chamber, the seats of each pair being located upon opposite sides of one of the valves, water inflow ports communicating with the casing between the

valve seats of said pairs of seats, water outflow chambers, one located at the outer side of the outermost of one pair of valve seats and the other located at the outer side of the outer one of the other pair of valve seats, outflow passage means connected with the outflow chambers, and means for operating the valves.

2. In means of the class described, in combination, a valve casing having a main line water supply port, valves at opposite sides of said port and movable so as to maintain positions always on opposite sides of the port, a pair of valve seats for each valve between which the valve operates, water inflow ports communicating with the casing at points between the valve seats, water outflow ports communicating with the casing at points beyond the valve seats which are more remote from the water supply port and means for operating the valve.

3. Valve means of the class described, comprising a casing having separate water inflow pipes connected therewith, a water main line supply port communicating with the casing between said inflow pipes, an outflow chamber adjacent to each inflow pipe but more remote from the water supply port than the inflow pipe connection therewith, valves mounted in the casing, valve seats intermediate each valve and the water supply port, a valve seat intermediate each valve and the adjacent outflow chamber, said valve seats and valves being adapted to engage face on, and means for operating the valves to establish communication between an inflow pipe and the water supply port while said inflow pipe is cut off by a valve from the adjacent water outflow chamber, and the other inflow pipe is cut off from communication with the water supply port while in communication with the adjacent water outflow chamber.

4. Valve means of the class described, comprising a casing having separate water inflow pipes connected therewith, a water main line supply port communicating with the casing between said inflow pipes, an outflow chamber adjacent to each inflow pipe but more remote from the water supply port than the inflow pipe connection therewith, valves mounted in the casing, valve seats intermediate each valve and the water supply port, a valve seat intermediate each valve and the adjacent outflow chamber, said valve seats and valves being adapted to engage face on, and means for operating the valves to establish communication between an inflow pipe and the water supply port while said inflow pipe is cut off by a valve from the adjacent water outflow chamber, and the other inflow pipe is cut off from communication with the water supply port while in communication with the adjacent water outflow chamber, the means for operating the valves comprising a rod on which the valves are removably mounted and means for holding the valves in place on said rod.

5. Valve means of the class described comprising a casing having a water supply port at its central portion, valve seats at opposite sides of said port and within the casing, a valve seat adjacent to each of the valve seats aforesaid, spaced therefrom, a valve between each of the last mentioned valve seats and its particular adjacent valve seat, water inflow pipes communicating with the casing at points between each set of valve seats on opposite sides of the water supply port, an outflow passage means leading from the casing and having controlled communication with the inflow pipes by means of said valves.

6. Valve means of the class described comprising a casing having a water supply port at its central portion, valve seats at opposite sides of said port and within the casing, a valve seat adjacent to each of the valve seats aforesaid, spaced therefrom, a valve between each of the last mentioned valve seats and its particular adjacent valve seat, water inflow pipes communicating with the casing at points between each set of valve seats on opposite sides of the water supply port, an outflow passage means leading from the casing and having controlled communication with the inflow pipes by means of said valves, means to actuate the valves comprising a rod extending longitudinally of the casing therein, detachable means securing the valves on the rod so that the valves coact with the valve seats by engagement face on therewith, the valve seats being of smaller diameter than the valves and being removably mounted in the casing for detachment therefrom to permit removal of the valves.

In testimony whereof I affix my signature.

ERICH H. LICHTENBERG.