Jan. 8, 1929. 1,698,183

K. W. BARTLETT

LIQUID TREATING APPARATUS

Filed March 19, 1928

Fig. 1.

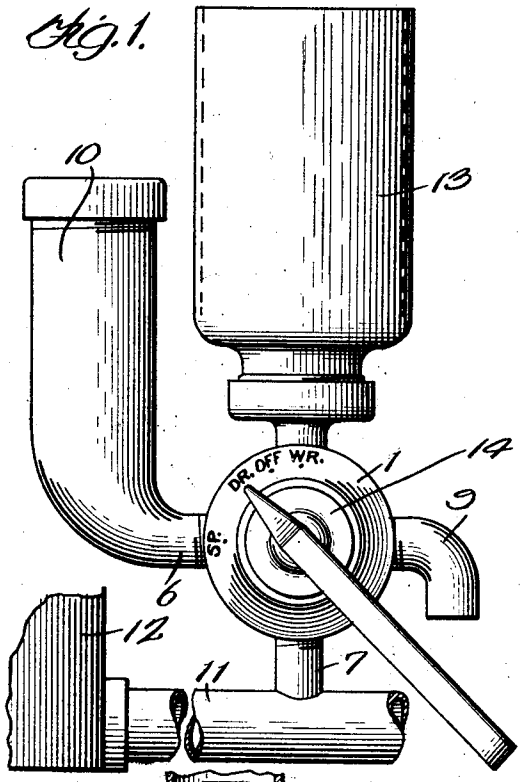


Fig. 2.

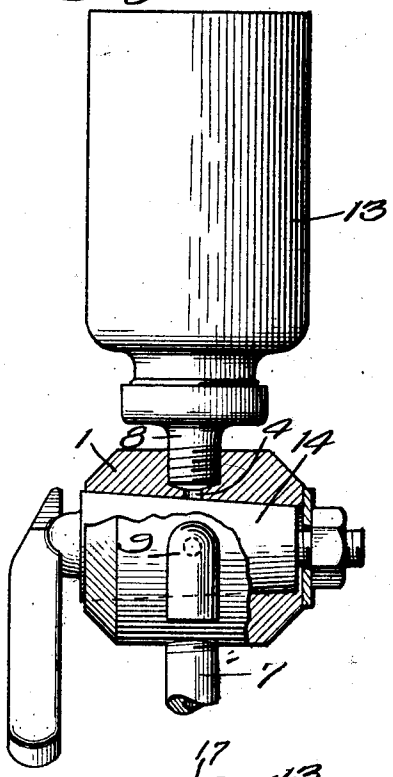


Fig. 3.

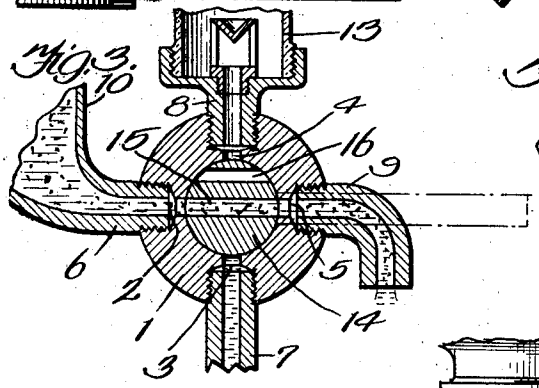


Fig. 4.

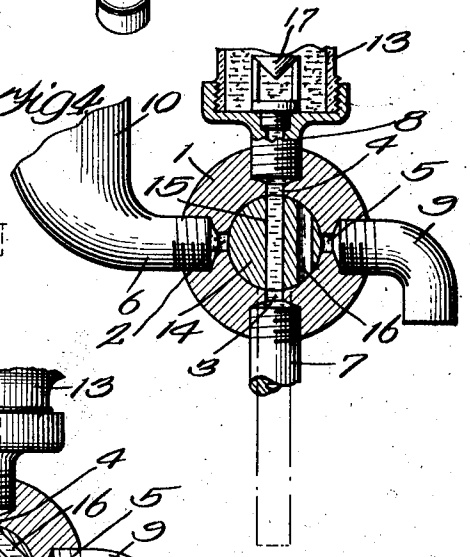
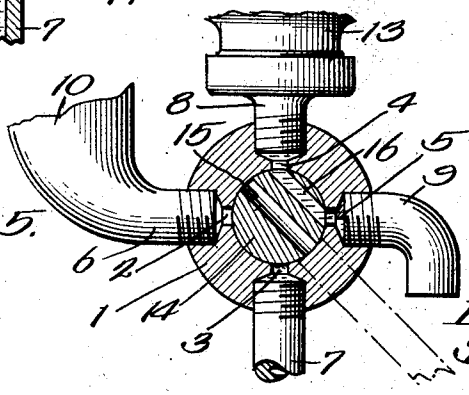


Fig. 5.



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UNITED STATES PATENT OFFICE.

KENT W. BARTLETT, OF HAMMOND, INDIANA.

LIQUID-TREATING APPARATUS.

Application filed March 19, 1928. Serial No. 262,806.

My invention relates to liquid treating apparatus and is inclusive of a source of the liquid that is to be treated, a source of the chemical that is to be employed in the treatment, a receiver into which both the chemical and liquid are to be received, and a valve structure controlling the passage of liquid and chemical to the receiver. This valve structure, in one position, receives and measures the portion of chemical that is to be passed to the receiver and, in another position, enables the flow of the liquid into the receiver, this liquid passing through the same valve port in which the measured quantity of chemical was trapped and forcing, or carrying therewith, the passage of this chemical into the receiver.

My invention is of particular utility in testing softened water with soap. When the invention is employed for testing purposes, the valve structure also desirably enables the discharge of the tested liquid from the receiver, to condition the receiver for the next testing operation.

The invention will be more fully explained in connection with the accompanying drawing in which Fig. 1 is a side elevation of the preferred embodiment of the invention, with a portion broken away; Fig. 2 is a view taken at right angles to the direction in which Fig. 1 is taken, parts being broken away; Fig. 3 is a horizontal sectional view through the valve which is shown as being adjusted to establish connection between the chemical source and the valve port in which a measured quantity of chemical is to be temporarily trapped; Fig. 4 is a view similar to Fig. 3 but showing the liquid source and receiver in communication with the chemical containing valve port; and Fig. 5 shows the receiver in communication with a vent or discharge port.

The valve structure includes a circular valve casing 1 having ports 2, 3, 4 and 5 extending therethrough into the interior or bore of the casing, these ports being distributed around the casing at 90 degree intervals. Pipes 6, 7, 8 and 9 are screwed into the casing, being respectively received in said ports. Pipe 6 is a continuation of a soap or chemical container or source 10. Pipe 7 branches from pipe 11 into which liquid, such as softened water, is supplied from a soft water tank of which a part 12 is illustrated. Pipe 8 leads to the bottom of a receiver or reaction chamber 13. Pipe 9 is a vent or discharge pipe through which liquid is discharged from the receiver after the testing has been accomplished.

The rotary valve 14 has a port 15 formed diametrically therethrough. Another port 16 is formed through the valve alongside of port 15. When the valve is adjusted as indicated in Fig. 3, soap or other chemical flows from the source 10 into port 15 and also into vent pipe 9. When port 15 is filled, the valve is turned into the position shown in Fig. 4 to bring the liquid source 12 into communication with port 15. It is understood that source 12 extends upwardly sufficiently to hold the liquid sufficiently above the source 13 to enable the liquid to force its way by gravity upwardly through port 15 and to the desired extent into receiver 13, the upwardly flowing liquid carrying the soap or chemical with it into the receiver. When sufficient liquid is passed into the receiver, the valve is turned to a position in which all ports are closed. After the reaction has occurred, the valve is turned to the position shown in Fig. 5 where the valve port 16 is shown in communication with ports 4 and 5 to empty the receiver through pipe 9, all other ports being closed. A baffle 17 prevents the jetting of incoming fluid over the open top of the receiver.

Changes may be made without departing from the invention.

Having thus described my invention, I claim:

1. Liquid treating apparatus including a valve having two ports passing therethrough; a valve casing having four ports extending therethrough to the space occupied by the valve; a source of chemical connected with one of the ports in the valve casing; a source of liquid to be tested connected with a second port in the valve casing; a receiver connected with a third port in the valve casing, the fourth port in the valve casing being a vent, the various ports in the valve and casing being related to each other and to the valve and casing to bring one of the valve ports into communication with the first and fourth ports in the casing and to close the remaining ports when the valve is in one position, to bring this valve port into communication with the second and third ports in the casing and to close the remaining ports when the valve is in a second position, to close all ports when the

valve is in a third position, and to bring the other valve port into communication with the third and fourth ports in the casing when the valve is in a fourth position, the remaining ports being then closed.

2. Liquid treating apparatus including a valve having a port passing therethrough; a valve casing having three ports extending therethrough to the space occupied by the valve; a source of chemical connected with one of the ports in the valve casing; a source of liquid to be tested connected with a second port in the valve casing; a receiver connected with a third port in the valve casing, the various ports in the valve and casing being related to each other and to the valve and casing to bring said valve port into communication with the first port in the casing and to close the remaining ports when the valve is in one position, to bring this valve port into communication with the second and third ports in the casing and to close the remaining ports when the valve is in a second position, and to close all ports when the valve is in a third position.

In witness whereof, I hereunto subscribe my name.

KENT W. BARTLETT.