

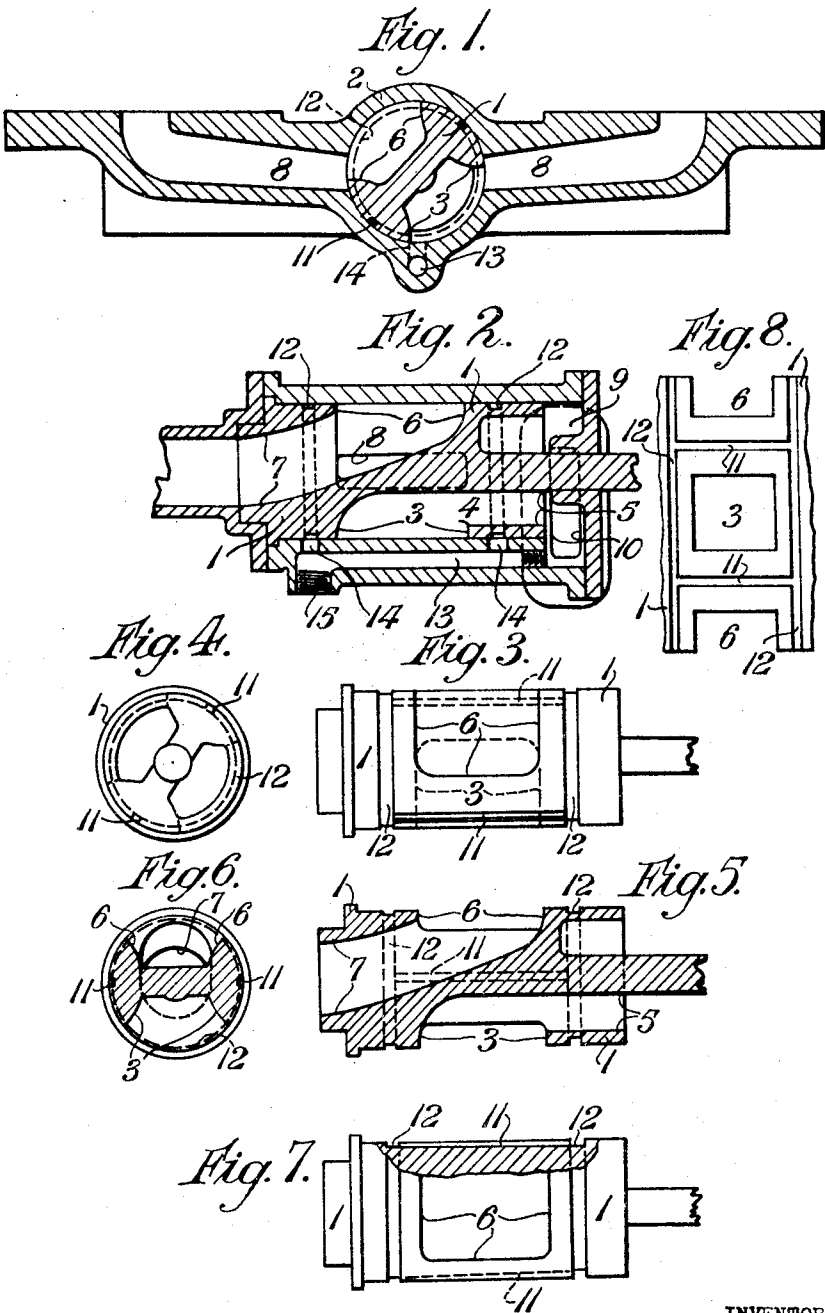
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PLUG COCK

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UNITED STATES PATENT OFFICE.

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PLUG COCK.

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This invention relates to improvements in plug cocks, and more particularly to means for preventing loss, due to leakage.

According to the present invention we provide a plug cock having a plurality of ports formed in its periphery with grooves or recesses formed in the periphery of the plug and extending completely around one or more of the ports, and means adapted to return any leakage liquid from grooves or recesses to a reservoir or the like.

In one form of construction, as applied to a four-way plug cock adapted to supply liquid to a pair of containers and to deliver it therefrom, one container being filled while the other is being emptied, the axis of the plug is horizontal; the ports communicating with the containers are located on the periphery of the plug, while the delivery outlet is coaxial with the plug.

The plug is provided with longitudinal grooves, located between the ports and communicating with circumferential grooves which are formed between the ends of the plug and the end walls of the ports, the said grooves being in communication with the suction side of a pump supplying liquid to said plug, or with the reservoir from which the liquid supplied to the plug cock is drawn.

In a plug cock constructed in this manner, it will be seen that provided the leakage past the plug is not greater than can be dealt with by the grooves and returned to the reservoir, no loss of liquid will occur. Moreover, since any leakage past the plug is for this reason recoverable, it is possible to employ a cylindrical plug, there being no longer any necessity to have a ground-in fit between the plug and the cock casing.

In a cock thus constructed, the plug can obviously be so made that it can be turned with the minimum of friction, and consequently is particularly suitable for apparatus in which the plug is turned automatically, as in the case of a curb-side petrol pump adapted to fill and empty a pair of containers alternately.

The invention is illustrated in the accompanying drawing, as applied to a four-way cock adapted to supply liquid to a pair of containers and to deliver it therefrom, one container being filled whilst the other is being emptied.

In this drawing, Figure 1 is a vertical section and Figure 2 a section at right angles to

Figure 1. Figure 3 is a front elevation of the plug, Figure 4 an end elevation thereof, Figure 5 a vertical section, Figure 6 a section at right angles to Figure 5, and Figure 7 a sectional plan. Figure 8 is a development of the plug cock.

1 is a cylindrical plug which is horizontally mounted in a casing 2, and is formed with an inlet port 3 in communication through a passage 4 with an inlet 5, and with an outlet port 6 in communication with an outlet 7 coaxial with the axis of the plug. The inlet port 3 and the outlet port 6 are adapted alternately to be placed in communication with passages 8 which direct the fluid to and from the containers, the arrangement being such that when the plug is in the position shown in Figure 2, fluid passes from a chamber 9, provided with an inlet pipe 10 in communication with a pump (not shown) through the inlet 5, passage 4, port 3 and right hand passage 8 to one of the containers, and simultaneously fluid passes from the other container through the left hand passage 8, outlet port 6, and outlet 7, and when the plug 1 is rocked in a clockwise direction (as seen in Figure 1) through 90°, that container which was being filled now discharges, and that container which was discharging is now filling.

11 are longitudinal grooves which are located between the inlet port 3 and the outlet port 6, and are in communication with circumferential grooves 12 formed between the ends of the plug 1 and the end walls of the ports 3 and 6; 13 is a passage which through holes 14 communicates with the grooves 12, and 15 is a connection to which is secured a pipe (not shown) adapted to lead any liquid from the passage 13 to a reservoir or to the suction side of the pump.

It will be seen that since the inlet port 3 is completely surrounded by the grooves 11 and 12, any liquid which might otherwise leak either along the plug or into the outlet port 6 is trapped and returned to the reservoir or pump, and that as a result, the plug may be made so that it can be turned with a minimum of friction and consequently is particularly suitable for apparatus in which the plug is turned automatically, as in the case of a curb-side petrol pump.

What I claim is:—

1. In a plug cock the combination of a plug, a plurality of ports formed in the periphery of said plug, grooves formed in the periphery

of said plug and extending completely around said ports, and means adapted to place said grooves in communication with a reservoir.

2. In a plug cock, the combination of a plug, a plurality of ports formed in the periphery of said plug, circumferential grooves in the periphery of the plug and located between the ends of said plug and the end walls of said ports, longitudinal grooves in the periphery of the plug located on each side of one of said ports and in communication with said circumferential grooves, and means adapted to place said grooves in communication with a reservoir.

3. In a plug cock, the combination of an inlet port formed in the periphery of the plug, an outlet port formed in the periphery of the plug, a port in communication with said inlet port, a port in communication with said outlet port, circumferential grooves in the periphery of the plug located between the ends of said plug and said inlet and outlet ports, longitudinal grooves in the periphery of the plug located between said inlet and outlet ports and in communication with said circumferential grooves, and means adapted to place said grooves in communication with a reservoir.

4. In a plug cock, the combination of a plug, a plurality of ports formed in the periphery of said plug, grooves formed in the periphery of said plug and extending completely around said ports, a drain passage, ports in the casing of said plug cock, in communication with said passage, and in communication with said grooves.

5. In a plug cock, the combination of a plug, a plurality of ports formed in the periphery of said plug, circumferential grooves in the periphery of the plug and located between the ends of said plug and the end walls of said ports, longitudinal grooves in the periphery of the plug located on each side of one of said ports and in communication with said circumferential grooves, a drain passage, and ports in the casing of said plug cock, in communication with said passage and in communication with said grooves.

6. In a plug cock, the combination of an inlet port formed in the periphery of the plug, an outlet port formed in the periphery of the plug, a port in communication with said inlet port, a port in communication with said outlet port, circumferential grooves in the periphery of the plug located between the ends of said plug and said inlet and outlet ports, longitudinal grooves in the periphery of the plug located between said inlet and out-

let ports and in communication with said circumferential grooves, a drain passage, and ports in the casing of said plug cock, in communication with said passage and in communication with said grooves.

7. A plug cock having an inlet port in the periphery of said plug cock and adapted alternately to be placed in communication with a pair of containers, a port adapted to be placed in communication with a fluid supply means and located in the plug cock, a passage connecting said last mentioned port to said inlet port, an outlet port formed in the periphery of said plug cock and adapted alternately to be placed in communication with said containers, a port located in said plug cock, a passage connecting said last mentioned port to said outlet port, circumferential grooves in the periphery of said plug cock and located between said inlet and outlet ports, and the ends of said plug cock, longitudinal grooves in the periphery of said plug cock and located between said inlet and outlet ports and in communication with said circumferential grooves, and means adapted to place said grooves in communication with a reservoir.

8. In combination a plug cock, a casing within which said plug cock is rotatably mounted, an inlet port in the periphery of said plug cock and adapted to be placed alternately in communication with a pair of containers, a port adapted to be placed in communication with said fluid supply means and located in the plug cock, a passage connecting said last mentioned port to said inlet port, an outlet port formed in the periphery of said plug cock and adapted alternately to be placed in communication with said containers, a port located in said plug cock, a passage connecting said last mentioned port to said outlet port, circumferential grooves in the periphery of said plug cock and located between said inlet and outlet ports and the ends of said plug cock, longitudinal grooves formed in and extending to the periphery of said plug cock and located between said inlet and outlet ports and in communication with said circumferential grooves, ports in said casing in communication with said grooves and means adapted to place said ports in communication with a reservoir.

In testimony that I claim the foregoing as my invention, I have signed my name this 15th day of December, 1927.

JOSEPH LAWSON.