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HYDRAULIC SYSTEM FOR THE DISTRIBUTION OF OIL.

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927,008.

Patented July 6, 1909.

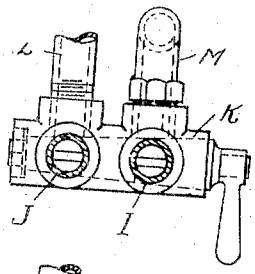


FIG. 3.

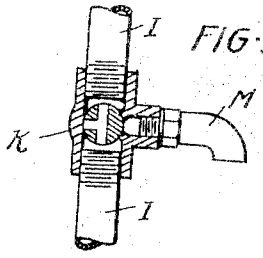


FIG. 2.

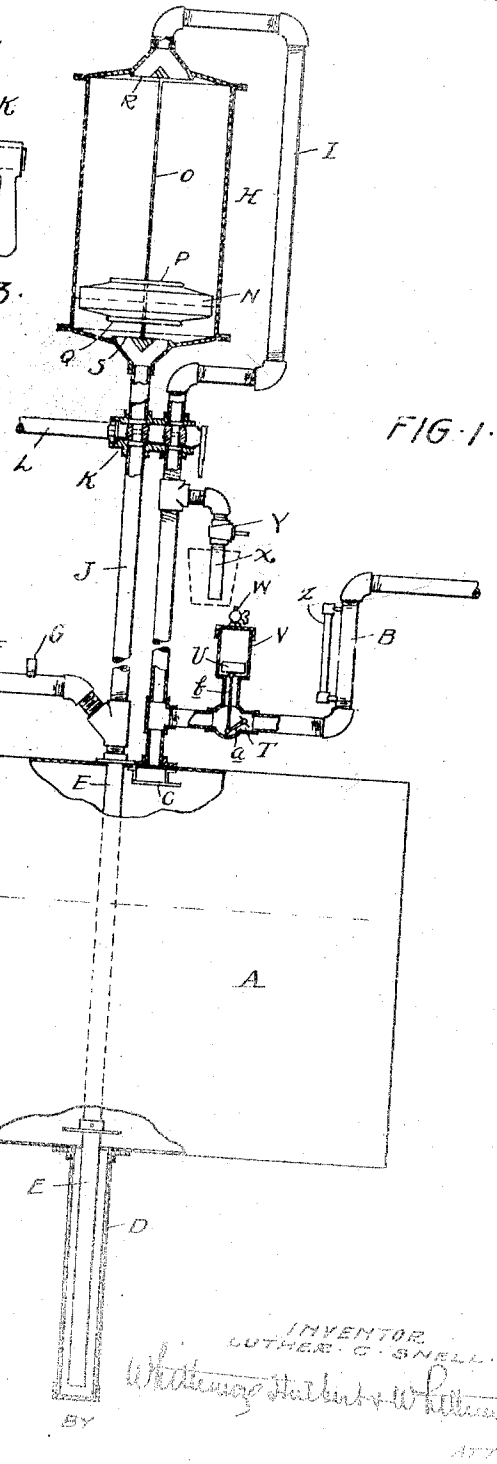


FIG. 1.

WITNESSES

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UNITED STATES PATENT OFFICE.

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HYDRAULIC SYSTEM FOR THE DISTRIBUTION OF OIL.

No. 927,008. Specification of Letters Patent. Patented July 6, 1909.

Application filed February 20, 1906. Serial No. 302,120.

To all whom it may concern:

Be it known that I, LUTHER C. SNELL, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Hydraulic Systems for the Distribution of Oil, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to systems for the distribution of oil, in which the oil in the storage tank is propelled to the point of consumption by hydrostatic pressure.

It is the primary object of the invention to avoid possibility of accident by limiting the quantity of oil that can be discharged through the tap.

It is a further object to avoid placing pressure upon the oil distributing connections; further, to prevent possibility of overfilling the storage tank.

With these objects in view, the invention consists in the construction as hereinafter described.

In Figure 1 of the drawings, the system is illustrated in vertical section; Fig. 2 is a cross section through the valve; and Fig. 3 is a plan thereof.

A is the storage tank, preferably located below the ground level and provided with a fill connection B. This connection enters the top or upper part of the tank and is preferably provided with a deflector plate C for causing the lateral discharge of the oil in entering the tank.

D is a depending water leg from the bottom of the tank, and E is the water inlet pipe which passes downward through the tank to near the bottom of this water leg D.

F is a discharge pipe connected with the water inlet pipe E and leading to the drain, and G is a vent in this discharge pipe for maintaining atmospheric pressure therein. The level of this discharge is so located as to limit the height to which the oil can be lifted hydrostatically. Thus the pressure developed in the tank can never be sufficient to force the oil upward in the oil distributing system against atmospheric pressure.

To lift the oil from the storage tank and propel it to the desired point of consumption, I make use of a siphon, together with a small tank or receptacle in which a limited quantity of oil may be filled by the action of the siphon.

As shown, H is the auxiliary tank or receptacle which is located at a point in proximity to the tap.

I is an oil supply pipe leading from the upper part of the tank A to the top of the auxiliary tank H, and J is a water-pipe leading from the bottom of the auxiliary tank H to the bottom of the tank A and connected to the water supply pipe E. Both of these pipes are valve-controlled, preferably by a double valve K which is of the three-way type. The ports in this valve are so arranged that in one position (indicated in full lines in the drawing), both of the pipes I J are opened, while in another position (indicated in dotted lines), both of the said pipes are cut off and the portions thereof above the valve are respectively connected to the water-supply pipe L and the tap M.

By the arrangement just described, when the valve is in the position indicated in dotted lines, water under pressure enters through the pipe L and passes into the lower end of the auxiliary tank H, forcing out any oil that may be contained therein through the pipe I to the tap M. On the other hand, when the valve is in the position indicated in full lines, free communication is established between the auxiliary tank H and the main tank A, with the result that the greater specific gravity of the water will cause it to descend through the pipe J, siphoning the oil upward through the pipe I and into the upper part of the auxiliary tank H. With such an apparatus, if the operator is careful to properly manipulate the valve K, the tank H may be successively filled and emptied until the supply in the main tank A is exhausted, while at no time is there a pressure developed upon the oil pipe I, between the valve K and the tank A, which is in excess of atmospheric pressure. If, however, the valve K is not turned into the position indicated in full lines at the proper time, the water entering through the supply pipe L, after filling the auxiliary tank H, may pass upward into the oil pipe I and fill the latter also, thereby discharging water from the tap. Again, if the valve K during the siphoning operation is not turned to the dotted position at the proper time, the oil, after filling the tank H, will pass downward into the pipe J. Both of these difficulties I have avoided by placing within the auxiliary tank H a float N constructed to be maintained between the oil

and water, and, by providing this float with valves which automatically cut off connection between the tank and the water and oil pipes.

As shown, O is a guide stem passing axially and vertically through the tank H. Upon this guide stem the float N is loosely sleeved and guided and at the top and bottom of the float are arranged respectively the valve faces P Q.

R S are valve seats formed at the top and bottom of the tank and respectively surrounding the inlets from the pipes I J. Thus the disk P will be pressed against the seat R before water can reach the pipe I and the disk Q will rest upon the seat S before oil can reach the pipe J.

As has been stated, the tank A is filled from the connection B. To prevent possibility of over-filling the tank and forcing oil out through the water inlet pipe E and discharge pipe F to the drain, I arrange an automatic valve T in the pipe B. This valve is operated by a float U in a casing V forming a riser from the pipe B, the valve being preferably of the butterfly type and operated by a rock arm *a* and link *b* connecting to the float. The proportion of parts is such that before the oil filled into the tank A can displace the water in the well or water-leg D, the hydrostatic pressure of the water in the inlet pipe E will be sufficient to raise the oil level above the tank A, filling the casing V. Thus, as the oil rises in this casing, the float U will be lifted, operating the butterfly-valve T, so as to close the fill connection B. In case of any leakage through the valve, this is prevented from further displacing the water in the water-leg D by providing a vent, such as W, for the casing V, which will permit an overflow.

In use when oil is drawn from the tap M, it sometimes occurs that a greater supply is drawn than is needed. To return this into the tank A, I provide a connection X to the pipe I, between the valve K and the tank A, said connection being itself controlled by a valve Y and preferably extending downward. Whenever the operator wishes to return oil drawn to the tank, he inserts the lower end of the pipe X into the receptacle containing the oil and then opens the valve Y, whereupon the suction which is always maintained upon the pipe I below the valve K will draw into said pipe the oil in said receptacle.

I preferably arrange a transparent gage Z in connection with the oil inlet pipe B which will indicate the height of the oil during the filling operation and enable the operator to cut off the supply after the closing of the automatic valve T.

What I claim as my invention is,—

1. The combination with a receptacle having a water connection at one end and an oil connection at the opposite end thereof, through which connections the receptacle is alternately filled with water and oil, of automatic means for preventing the liquid from one connection entering the opposite connection.

2. The combination with a receptacle having a water connection at its lower end and an oil connection at its upper end, of means controlling the water connection, whereby said receptacle is alternately filled with water therefrom and filled with oil upon the discharge of the water by siphonage, of automatic means for preventing the passage of the one liquid into the connection for the other liquid.

3. The combination with a receptacle having a water connection at its lower end and an oil connection at its upper end, of a float in said receptacle adapted to be maintained between the oil and water, and means operated by said float when at either end of said receptacle for cutting off communication with the connection thereto.

4. The combination with a receptacle having a water connection at its lower end and an oil connection at its upper end, of a float in said receptacle adapted to be maintained between the oil and water, and valves automatically operated by said float respectively when at opposite ends of said receptacle to cut off communication with the connections thereto.

5. The combination with a storage tank, of a receptacle above said tank, connections between the upper ends of said tank and receptacle and the lower ends thereof respectively, a water supply connection to the connection between the lower ends of said tank and receptacle, an oil discharge connection to the connection between the upper end of said tank and receptacle, a single valve controlling said connections, and a float in said receptacle for cutting off communication between the same and connections at the opposite ends thereof, for the purpose described.

6. The combination with a storage tank and a receptacle above the same, of a connection therebetween through which said receptacle is filled from said tank by siphonage, and a valve-controlled pipe in said connection for returning oil to said storage tank.

7. The combination with a storage tank, a receptacle thereabove and a valve-controlled connection between said receptacle and tank through which the former is filled from the latter by siphonage, of a pipe connecting with said connection below the valve, and a valve in said pipe whereby oil may be returned therethrough by suction to said storage tank.

8. The combination with a storage tank and a water supply connection thereto for maintaining a constant hydrostatic pressure thereon, of an oil supply connection and a valve in said connection automatically con-

trolled by variation in the height of the combined water and oil column sustained by said hydrostatic pressure.

9. The combination with a storage tank and a water connection thereto for maintaining a constant hydrostatic pressure thereon, of an oil supply connection above said tank, a riser from said connection, a float in said riser, and a valve controlling said connection automatically operated by said float during fluctuations in the height of oil in said riser.

10. The combination with an oil-distributing system, of automatic means for lifting the oil by suction, and a valve-controlled inlet pipe connected to said system through which the oil may be returned.

In testimony whereof I affix my signature in presence of two witnesses.

LUTHER C. SNELL.

Witnesses:
JAMES P. BARRY,
EDWARD P. AULT.