AUTOMATIC WATER DRAIN FOR OIL TANKS

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To all whom it may concern:

Be it known that I, JOHN ADAIR JOLLY, a citizen of the United States, residing at Long Beach, in the county of Los Angeles and State of California, have invented new and useful Improvements in Automatic Water Drains for Oil Tanks, of which the following is a specification.

This invention relates to drains for oil tanks, and has for its object to provide an automatically acting water drain for oil tanks.

As is well known water forms a constituent of the products of nearly all oil wells, and this water naturally settles to the bottom of the storage tanks containing the oil.

My present invention consists of means for automatically withdrawing the water from a tank.

Other objects and advantages will be made manifest in the following specification of an embodiment of the invention illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of a storage tank in which the invention is combined.

Fig. 2 is a vertical section of the water draining apparatus showing the control valve in closed position.

Fig. 3 is a similar section showing the control valve in open position.

Fig. 4 is a section horizontally on the line 4—4 of Fig. 2.

A storage tank T is here shown as provided with the usual main draining valve M for discharging the tank. A drain pipe D leads from the main valve M, and in my invention a drain pipe 2 is connected to the pipe D and is provided with an automatic drain valve 3 from which leads a pipe 4 connecting to the drain pipe D which latter may be provided with an intermediate valve 5 between the pipe connection 2 and the connection 4. The main valve M, in my invention, is normally open and the intermediate valve 5 is closed so that drain is automatically accomplished through the pipe 2 and the automatic drain valve 3.

To accomplish the automatic opening and closing of the automatic valve 3, this latter is connected by a link 6 to a float 7 which is operative in a float chamber 8 through the bottom of which the link 6 operates. The float chamber is substantially closed and has an overflow pipe 9 leading from its upper portion and a valved drain pipe 10.

Above the float chamber 8 is a controlling chamber 11 communicating with the float chamber 8 through a port 12 which is closable by a suitable valve 13. The valve is shown as of a needle or conical plug type and has a stem 14 to the upper end of which is connected a member 15 which is of such buoyancy as to float in water, but is sufficiently heavier than oil to prevent its ascending in oil. In other words, the specific gravity of the member 15 is less than that of water and is equal to or greater than that of oil which is to be stored in the tank T, so that the member 15 becomes a float as to the water which passes into the control chamber 11 through a connecting pipe 16 leading to the lower portion of the tank so as to transfer water W therefrom to the controlling chamber 11. The top of the controlling chamber is connected by an oil transfer pipe 17 leading from the tank T at a level above the desired water level in the tank T.

From the above it will be seen that in the absence of water to a predetermined level in the tank and controlling chamber 11, the valve 13 will be seated by its member 15 against which the member 15 which, being heavier than the oil, will sink in the oil accumulated in the chamber 11. As water accumulates in the tank T it will rise to an equal level in the chamber 11 and after passing a predetermined level will lift the relatively buoyant member 15, and this will operate to open the automatic controlling valve 13. The opening of this valve results in the flow of water from the controlling chamber 11 down into the float chamber 8 and the escaping water will accumulate in this chamber, with the result that the float 7 will be elevated and the valve 3 will be opened and water will be drained through the drain connection 2 from the tank. An overflow of water from the float chamber is provided through the outlet 9, and the valve in the drain pipe 10 is adapted to be so set as to provide for the gradual running out of the water from the float chamber as soon as the automatic controlling valve 13 is again seated.

From the above it will be seen that I have provided a very simple, reliable and automatically operative means for sub-
stantially continuously draining water as it may accumulate in well storage tanks.

It is understood that this apparatus may be utilized for draining any liquid substance where there are substances in a common vessel having different specific gravities.

Further embodiments, modifications and variations may be resorted to within the spirit of the invention as here claimed.

What is claimed is:

1. Apparatus for automatically substantially continuously draining water in tanks containing oil as the water separates from the oil, comprising a water chamber and float operated drain valve therein, and an oil chamber having float means controlled by variation of water level in the tank for controlling the opening and closing of the drain valve.

2. Apparatus for automatically substantially continuously draining water in tanks containing oil as the water separates from the oil, comprising a float operated drain valve and a chamber therefor, and float means controlled by variation of water level in the tank for controlling flow of water to said chamber for the opening and closing of the drain valve, the said float means being disconnected from the drain valve.

3. Apparatus for automatically substantially continuously draining water in tanks containing oil as the water separates from the oil, comprising a water chamber and float operated drain valve therein, and an oil chamber having float means controlled by variation of water level in the tank for controlling the opening and closing of the drain valve, the said float means being combined with and opening and closing a controlling valve in said oil chamber.

4. An apparatus for automatically draining water from an oil tank and comprising a drain pipe connected to the tank, a float chamber, a valve in the drain pipe, a float in said chamber connected to said valve, and water controlled means for admitting water to the float chamber so as to open the valve.

5. An apparatus for automatically draining water from an oil tank and comprising a drain pipe connected to the tank, a float chamber, a valve in the drain pipe, a float in said chamber connected to said valve, water controlled means for admitting water to the float chamber so as to open the valve, said means including a controlling chamber connected to the tank so as to receive water and oil therefrom, and a valve device in the controlling chamber operative by the accumulation of water to admit water to the float chamber.

6. In combination with an oil container, a controlling chamber having water and oil supply connections with the container whereby water may flow into the chamber to a level equal to that in the container, a float controlled valve for discharging water from the chamber, a float chamber to which the discharged water from the controlling chamber passes, and a float in the float chamber connected to a drain valve for controlling draining of water from the container.

In testimony whereof I have signed my name to this specification.

JOHN ADAIR JOLLY.