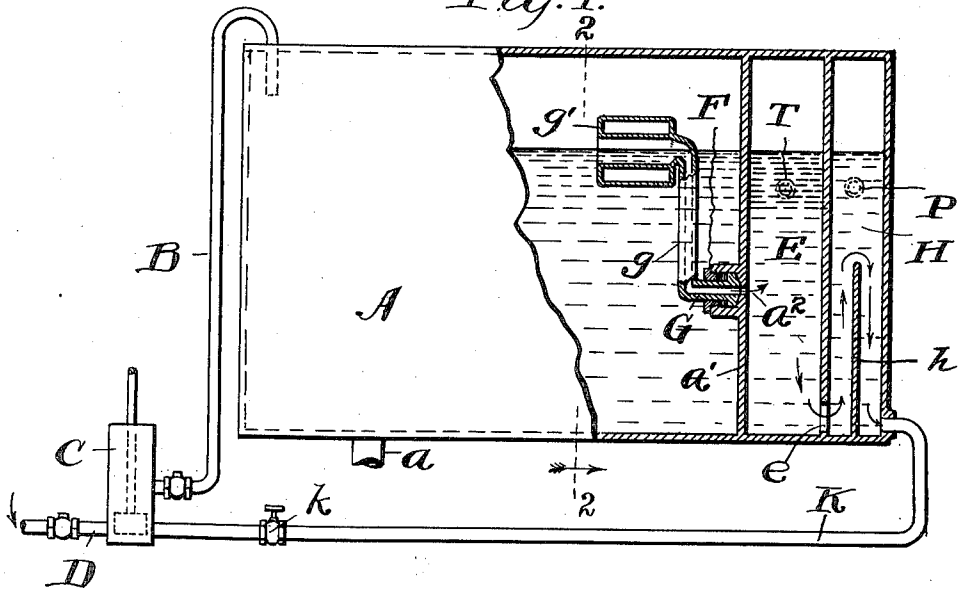
R. H. WHITE.

OIL AND WATER SEPARATOR.

APPLICATION FILED JAN. 6, 1910.

1,032,458. Patented July 16, 1912.

Fig. 1.



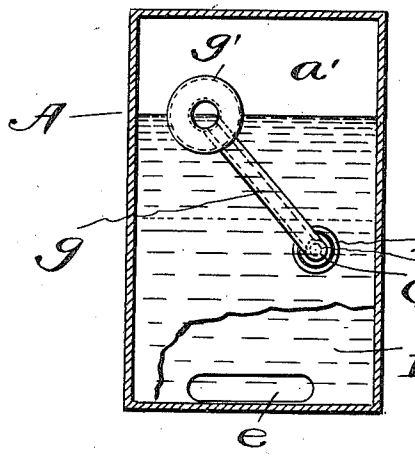


Fig. 2.

Witnesses.
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UNITED STATES PATENT OFFICE.

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OIL AND WATER SEPARATOR.

1,032,458. Specification of Letters Patent. Patented July 16, 1912.

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To all whom it may concern:

Be it known that I, ROLLIN H. WHITE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Oil and Water Separators, of which the following is a full, clear, and exact description.

In certain kinds of steam producing and using plants, the water after being converted into steam and used as such, is condensed and returned as water to the supply tank to be again used in the manner stated. Apparatus of this sort is to be found on steam automobiles; and it is for use on steam automobiles that the present invention is particularly, although not exclusively, adapted. The passage of the steam and water through the engine and condenser is responsible for the accumulation in said tank, to which the condensed steam is returned, of more or less oil and grease, which oil and grease accumulates in a surface layer of greater or less thickness. It is desirable that this oil or grease shall not accompany the water to the steam generator.

The object of this invention is to automatically remove the floating layer of oil and grease from the water in the supply tank, and to so segregate this grease from the water that it will not go with the water to the steam generator.

The invention is shown in the drawing, and is hereinafter described and defined in the appended claims.

In the drawing, Figure 1 is a side elevation partly sectioned of the preferred embodiment of the invention. Fig. 2 is a vertical section in the plane indicated by line 2—2 on Fig. 1.

Referring to the parts by letters A represents a feed water supply tank having a suitable outlet *a*, through which the water flows on its way to a steam generator. B represents a pipe through which the water produced by the condensed steam is returned to said supply tank after it has been transformed into steam and done its work. D represents the pipe which may lead from the condenser, and C represents a pump which may be of any suitable form by which the fluid may be pumped from the pipe D and discharged through the pipe B into the tank.

The apparatus to the extent above described is of conventional form.

Adjacent to tank A is a separating chamber E which in the construction shown is separated from the tank by a partition a' through which is the connecting passageway a^2. A rock shaft G is mounted in a stuffing box F on the tank side of this partition in communication with the passageway a^2. This shaft G has a crank arm g, which extends upward at an angle therefrom, and carries at its outer end a float g'. The float is tubular and so is the arm g and shaft G, so that there is formed through their parts a duct which communicates at its lower end with the separation chamber E, through the passageway a^2. This float is arranged so that the opening through it is substantially horizontal, and the buoyancy of the float is such that it will float on the liquid in the tank with a part of its open center dipping slightly below the surface layer of oil on the liquid in the tank. This oil layer may, therefore, float through the duct formed as stated. In fact, it will so flow until the liquid level in the tank and chamber E substantially aline, and thereafter, provided water be withdrawn from the separating chamber E.

There is an outlet *e* from the lower part of the chamber E. This outlet preferably connects with another chamber H which serves partly as a supplemental separating chamber. A partition *h* is placed in this chamber so as to compel the water to flow by the tortuous path shown by the arrows on Fig. 1 into a pipe K connected with the chamber H near the lower end thereof. This pipe may be connected with the pump C. The size of this pipe K at some part thereof, at least, must be such as to regulate the flow of the liquid through it, so that that flow shall be at such rate that the oil in the mixture of oil and water which flows through the duct in the float crank arm and shaft referred to, will have an opportunity to rise to the top of the liquid in the chamber E; or, at least, in the chamber H. Preferably a valve *k* is put into the pipe K by which to restrict its effective cross sectional area so as to make it easy to regulate the rate of flow through it.

The shaft G being free to rock in the stuffing box F, it is evident that whatever may be the level of the liquid in the tank

A within reasonable limits the float will always occupy substantially the position shown and above described. A mixture of oil and water from the surface of the liquid in the tank A will be constantly flowing through the described duct into the separating chamber E, and from thence into the supplemental separating chamber H. The oil will rise to the surface of the liquid in these two chambers and may be withdrawn from time to time through pipes indicated by T, P, in dotted lines on Fig. 1.

Having described my invention, I claim:

1. The combination of a water tank, a separation chamber, an open ended tubular float in said water tank, a duct connecting the open center of said float and said separation chamber, an outlet pipe connected with the lower end of said separation chamber, a pump connected with said pipe, and a pipe connecting the said pump and tank.

2. The combination of a tank, a separating chamber, the outlet of which is from the lower part of said chamber, of a rock shaft mounted on a substantially horizontal axis and an arm connected with said rock shaft and extending upward therefrom within the tank at an angle, and a float fixed to the upper end of said arm, said float and arm and rock shaft having through them a duct through which liquid from the tank may flow into said separation chamber, a supplemental separation chamber in connection with the main separation chamber and having its outlet near its lower end, and a vertical partition extending upward from the bottom of the supplemental separation chamber between the inlet and outlet thereof.

3. The combination of a tank, a separating chamber, the outlet of which is from the lower part of said chamber, of a rock shaft mounted on a substantially horizontal axis and an arm connected with said rock shaft and extending upward therefrom within the tank at an angle, and a float fixed to the upper end of said arm, said float and arm and rock shaft having through them a passageway through which liquid from the tank may flow into said separation chamber, a pipe communicating with the outlet of the separation chamber, a pump connected with said pipe, and a pipe connecting the pump and the water tank.

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

ROLLIN H. WHITE.

Witnesses:
E. L. THURSTON,
H. R. SULLIVAN.