

H. F. MARANVILLE.
 OIL AND WATER SEPARATOR.
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911,314.

Patented Feb. 2, 1909.

Fig. 1

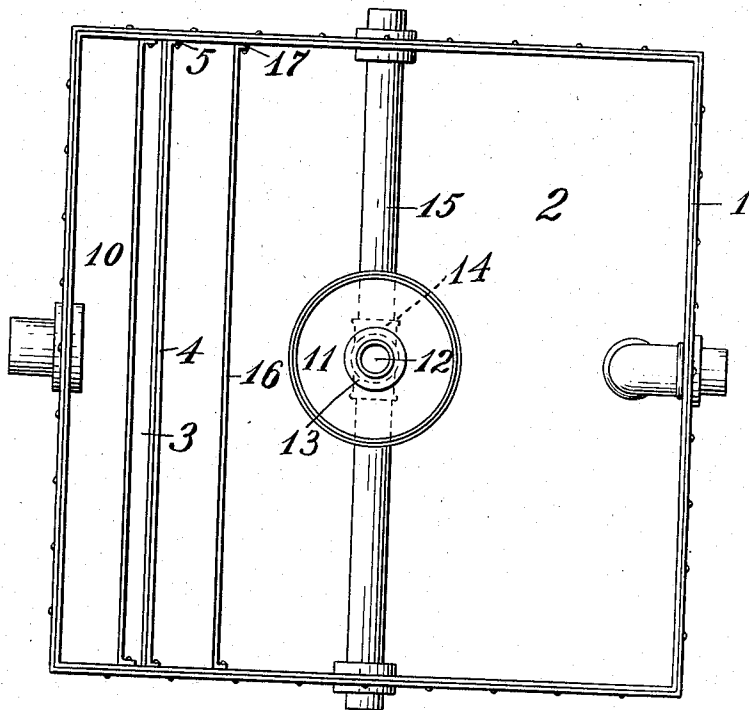
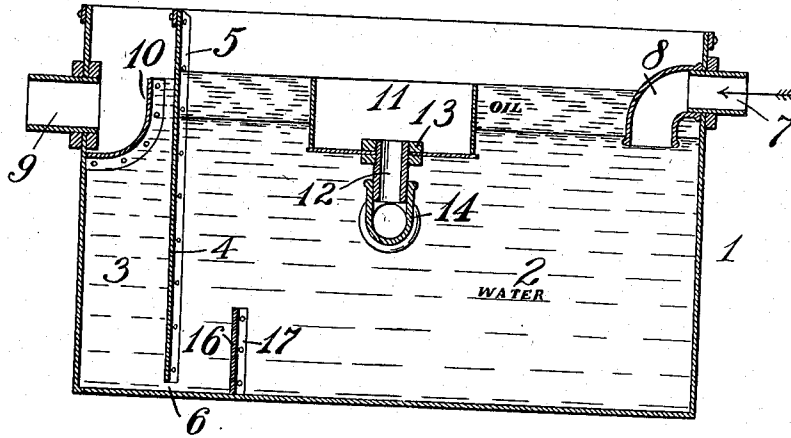


Fig. 2

Witnesses:

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UNITED STATES PATENT OFFICE.

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OIL AND WATER SEPARATOR.

No. 911,314.

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To all whom it may concern:

Be it known that I, HARVEY F. MARANVILLE, a citizen of the United States, residing at Akron, in the county of Summit 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, reference being had to the accompanying drawings.

My invention relates to oil-and-water separators and has for its object to provide an extremely simple but effective device of this kind that will absolutely separate the oil and water and prevent any oil (gasolene, naphtha, etc.) from being discharged with the water.

A further object of the invention is the provision of a self-contained device of this character that may be readily applied or connected to any convenient oil receptacle.

A still further object of the invention is to provide a device of this character that is adaptable to and equally efficient with different grades of oil, as engine oil, naphtha, gasolene, etc.

Generally speaking, the invention may be defined as consisting of the combination of elements, for the purposes specified, embodied in the claims hereto annexed.

In the drawings, Figure 1 represents a vertical sectional view through a separator constructed in accordance with my invention; and Fig. 2 represents a top plan view of the same.

Describing the parts by reference numerals, 1 represents a receptacle which may be of any desired shape in cross-section, being shown square in the drawing. This receptacle is divided into two compartments, 2 and 3, by a wall or partition 4. This wall or partition is secured to the side walls of the receptacle, as by means of side flanges 5 riveted thereto, and extends from near the top of the receptacle nearly to the bottom thereof to form a comparatively narrow or restricted passageway 6 beneath the same, by which communication is established between compartments 2 and 3. The partition or wall will be placed near one of the side walls of the receptacle and preferably parallel therewith, but sufficient space must be provided to accommodate sudden fluctuations or gushes in the supply to the compartment 2, as will be pointed out hereinafter.

Projecting through one of the side walls of compartment 2 is the inlet connection 7, through which oil and water are supplied, said connection being preferably provided with a down-turned discharge elbow 8 which dips below the level of the liquid in said compartment.

Projecting through the side wall of compartment 3 is the outlet connection 9 by which the water, after separation from the oil, is led to the sewer or other place of discharge.

10 represents a barrier or dam extending across the compartment 3 from below the outlet 9 above the top of the same, with its upper edge preferably parallel with the partition or wall 4. The upper surface of 10 is concave, providing a reservoir adjacent the outlet 9 whereinto water may flow from over the top of 10, and the upper edge of the same is slightly higher than the top of the outlet 9.

The oil outlet from the compartment 2 comprises a cup 11,—the bottom of which is adjustably connected to the outlet connection 12, as by a nut 13. The oil may be discharged by this connection into a tee 14 whence it may be distributed through branches 15 into conveniently located receptacles on each side of the receptacle 1.

Before placing the separator in operation, the top of the cup 11 will be set slightly above the top of 10. The receptacle will then be filled with water to a point at least above the bottom of the partition 4. It may be filled to its capacity (determined by the top of the barrier 10). Oil and water may then be introduced through the inlet 7, as by pumping. The oil, owing to its inferior gravity, will float on top of the water in the compartment 2, as indicated in Fig. 1. The top of the cup 11 is set slightly above the level of the top of 10. The height of the barrier 10 determines the "head" or height of the column of water in compartment 3, which in turn determines the height or head of the oil and water in 2. As the oil is lighter than the water, the height of the liquid in 2 will be greater than that of the liquid in 3. By setting the cup 11 with its top a little higher than the top of 10 and by extending the partition 4 downwardly a sufficient distance to provide considerable depth of liquid to the bottom edge thereof,

the device will automatically and absolutely separate the oil from the water. With a relatively shallow receptacle, as shown in the drawing, the partition will extend nearly to the bottom. By observing that the top of 11 is only a short distance above the top of 10, it will be absolutely impossible for any oil to pass into 3 and be discharged through the outlet 9, as the compartment 2 must be nearly filled with water to enable the column of water plus oil therein to balance the column of water in 3. In practice, with full-sized apparatus, by placing the top of 11 about $\frac{3}{8}$ " above the top of 10, there will be a depth of about three inches of oil on top of the water in 2, the depth of oil varying with the gravity thereof. For very light or very heavy oils, the cup 11 may be adjusted to accommodate the difference in the gravities thereof, but I have found the distance of $\frac{3}{8}$ " above the top of barrier 10 to accommodate all ordinary fluctuations in the gravities of the oils delivered into 2, (whether heavy oil, as engine oil, or light oil, as naphtha, gasolene, etc.)—without permitting any oil to pass below 4 and into 3.

The use of the barrier 10 maintains a constant head of water in 3, independent of the rate of flow through the outlet 9. With an outlet pipe leading from the side wall of compartment 3 and an irregular rate of flow of oil and water into 2, it will be evident that the level of the liquid in 3, and necessarily of that in 2, will fluctuate, making it difficult, if not impossible, to prevent the escape of water with the oil discharged through 11. The barrier 10, however, provides an extended trough communicating with 9 which will accommodate any unusual overflow of water from 10, due to gushes in the supply through the inlet 7, without any danger of backing up and varying the level of the water in 3.

The inlet 7 should be located considerably above the bottom of the partition 4, especially when provided with a downturned discharge end, to prevent any mingled oil and water from passing beneath the partition. To render it impossible for oil to pass under 4, due to the pressure under which oil and water may be supplied through the inlet 7, I may interpose a barrier 16 between the inlet and the bottom of the partition 4. This barrier is located adjacent the partition 4, projecting upwardly from the bottom of the receptacle and extending transversely thereof, having the ends attached to the side walls of the receptacle, as by side flanges 17 united thereto. Should the "head" or force of inflow through 7 be sufficient to carry any oil down toward the bottom of the receptacle and toward the passageway 6, the barrier 16 will deflect the same upwardly and thus prevent it from passing into the compartment 3.

The embodiment of my invention herein set forth will automatically and absolutely separate the oil and water and will permit only water unmingled with oil to flow from outlet 9. This is of great importance, as many cities have stringent regulations against discharging oil into their sewer systems. By my invention, however, the outlet 9 may discharge into a sewer without any danger of carrying oil thereto.

I claim:—

1. An oil-and-water separator comprising a compartment provided with an inlet for oil and water and a second compartment communicating at its lower portion therewith and provided with an outlet for water, a dam extending from below the water outlet as far as the top of the same and forming with a wall of the second compartment a trough or receptacle communicating with said outlet, and an outlet for oil in the former compartment having its upper end above the top of said dam, substantially as specified.

2. An oil-and-water separator comprising a pair of communicating compartments, one of said compartments being provided with an inlet for oil and water and the other being provided with an outlet for water and with means for maintaining a constant level of water therein, irrespective of variations in the supply thereto, and an oil outlet pipe leading from the first compartment and having a cup threaded on its upper end, substantially as specified.

3. An oil-and-water separator comprising a receptacle having a partition dividing the said receptacle into a water compartment and an oil and water compartment, said partition extending downwardly to a point adjacent to the bottom of said receptacle, said receptacle being provided with an oil outlet in the oil and water compartment, an inlet connection for oil and water carried by a wall of the oil and water compartment and having a downwardly directed discharge portion, and a barrier extending upwardly from the bottom of the water and oil compartment between the said partition and the oil and water connection, said barrier extending beyond the lower end of the partition and terminating between the lower end of said partition and the oil outlet, substantially as specified.

4. An oil and water separator comprising two communicating compartments, one for oil and water and the other for water alone, the former compartment being provided with an inlet for oil and water and an outlet for oil and the latter compartment being provided with an outlet for water, the oil and water inlet having a downwardly-directed discharge end located below the level of the oil outlet, and a single barrier interposed between the passageway connecting

the two compartments and the oil and water inlet, said barrier having its top below the oil outlet, substantially as specified.

5 An oil-and-water separator comprising a receptacle provided, adjacent to one wall thereof, with a partition extending downwardly nearly to the bottom of the receptacle and dividing the same into a relatively narrow water compartment and a relatively
10 wide oil and water compartment, a barrier in the latter compartment located adjacent to the partition and extending upwardly from the bottom of the receptacle to a point above the lower end of the partition and
15 below the oil outlet, an outlet for oil in the oil and water compartment, and an inlet connection in the wall opposite the first-mentioned wall of the receptacle, said inlet
20 discharge portion extending below the level of the oil outlet, substantially as specified.

6. An oil-and-water separator comprising a pair of communicating compartments, one of said compartments being provided with
25 an inlet for oil and water and the other being provided with an outlet for water and with means for maintaining a constant level of water therein, irrespective of variations in
30 the supply thereto, and an oil outlet pipe leading from the first compartment and having a cup vertically adjustable thereon, substantially as specified.

7. An oil and water separator, comprising
35 two compartments communicating near the bottoms of said compartments, one of the compartments being provided with an inlet for oil and water and the other provided

with an outlet for water, an oil outlet pipe leading from the first-mentioned compartment, and a cup mounted upon said pipe. 40

8. An oil and water separator comprising two compartments communicating near the
45 bottoms of said compartments, one of the compartments being provided with an inlet for oil and water and the other provided with an outlet for water, an oil outlet pipe leading from the first-mentioned compartment, and a cup adjustably mounted upon
said pipe.

9. An oil and water separator comprising
50 two communicating compartments, an inlet for oil and water in one compartment and an outlet for water in the other, a dam for maintaining a constant head of liquid in the
55 compartments, and an oil outlet in the first compartment comprising a pipe having a cup-shaped receiver.

10. An oil and water separator comprising
60 two communicating compartments, an inlet for oil and water in one compartment and an outlet for water in the other, a dam for maintaining a constant head of liquid in the
65 compartments, an oil outlet in the first compartment comprising a pipe having a cup-shaped receiver, and a barrier interposed between the passageway connecting the two
compartments and the water and oil inlet.

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

HARVEY F. MARANVILLE.

Witnesses:

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