

No. 752,999.

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M. P. OSBOURN.
OIL SEPARATOR.

APPLICATION FILED AUG. 6, 1903.

NO MODEL.

FIG. 1.

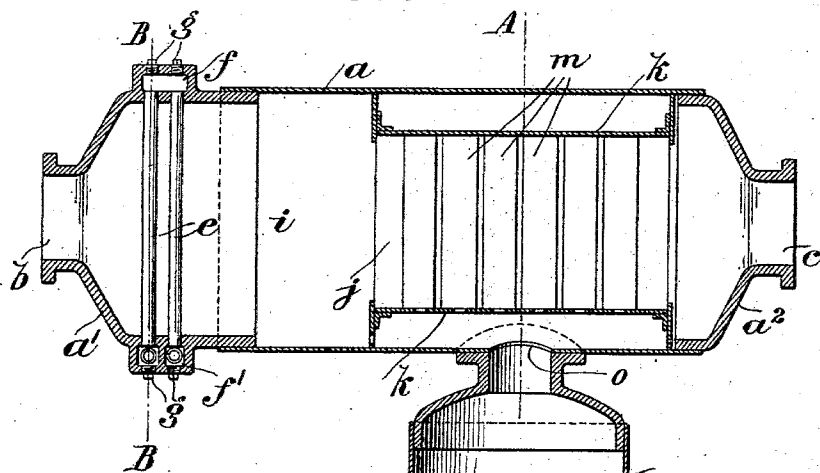


FIG. 2.

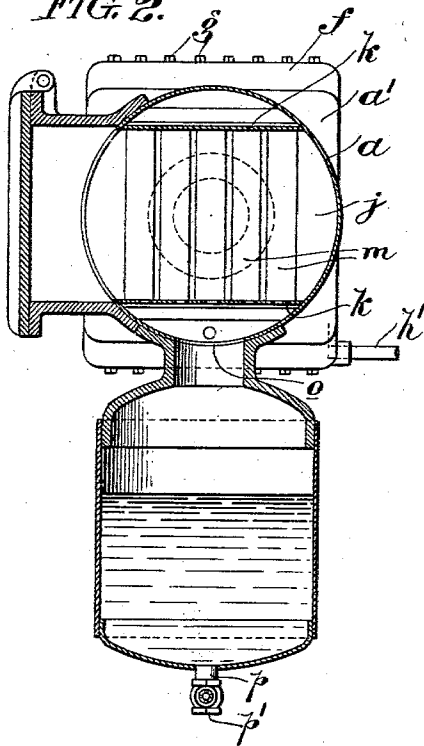
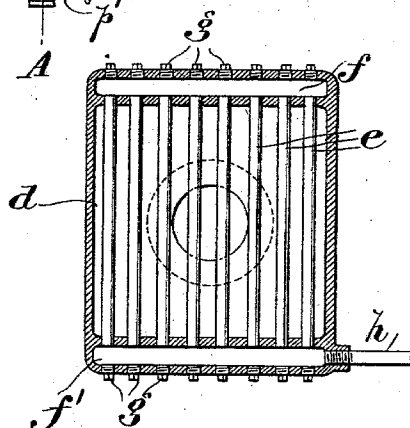


FIG. 3.



WITNESSES:

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MILLARD P. OSBOURN, OF MERCHANTVILLE, NEW JERSEY, ASSIGNOR
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OIL-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 752,999, dated February 23, 1904.

Application filed August 6, 1903. Serial No. 168,416. (No model.)

To all whom it may concern:

Be it known that I, MILLARD P. OSBOURN, of Merchantville, county of Camden, and State of New Jersey, have invented an Improvement in Oil-Separators, of which the following is a specification.

In separating oil from steam it has been found in many cases and with certain grades of oil that a large portion of the oil is vaporized and cannot be removed by the ordinary arrangement of baffles or baffle-plates. This difficulty is due to the high temperature of the steam and is aggravated when superheated steam is used. To overcome this difficulty, I lower the temperature of the steam by suitable water-cooled tubes immediately at its point of entrance to the separator, so that the oil becomes more or less condensed from its vaporous condition, owing to the lower temperature, and is more readily precipitated. To increase the precipitation of the oil from the steam after the temperature has been lowered, I employ an expansion-chamber into which the steam passes directly from the cooling-tubes. This expansion of the steam increases its volume and decreases its velocity, so that a large portion of the oil it contains will be precipitated to the bottom of the separator before the steam passes to the usual baffle-chamber.

In the drawings, Figure 1 is a longitudinal vertical sectional view of an oil-separator embodying my improvements. Fig. 2 is a transverse sectional view on the line A A of Fig. 1, and Fig. 3 is a similar view on the line B B of Fig. 1.

The body of the separator consists of the usual outer shell *a*, having heads *a'* *a''*, formed, respectively, with the inlet *b* and outlet *c*. Directly adjacent to the inlet *b* is arranged a series of tubes *e*, through which cool water is circulated to cool the steam at the point of entrance. In my preferred construction these pipes are arranged vertically in one or more rows and communicate at top and bottom with headers *f* *f'*, formed in the inlet-casting. The headers are shown formed with apertures closed by screw-plugs *g* in line with the tubes

to facilitate cleaning and the removal and replacement of the tubes. Water is supplied by a supply-pipe *h* and is discharged through a pipe *h'*. To save the heat given up by the steam through the cooling action of the tubes, the water which circulates through the tubes may be part of the feed-water which reaches the boiler.

Back of the cooling-tubes *e* is an expansion-chamber *i* of substantial length through which the steam passes before reaching the baffle-chamber *j* and is permitted to expand. This expansion of the steam increases its volume and decreases its velocity, and consequently the entrained oil and oily water will be more readily precipitated. Communicating directly with the expansion-chamber is the baffle-chamber *j'*, which may be of any suitable construction. As shown, it is formed within the body *a* by horizontal plates *k* *k*, between which are arranged a series of vertical baffles *m*, preferably of the standard Webster form.

n is a drip-chamber which communicates with the baffle-chamber through an opening *o* in the base of the shell *a*. The lower plate *k* is perforated, so that the oil and oily water extracted by the baffles *m* may pass to the outlet *o* and thence to the drip-chamber. The drip-chamber is provided with a discharge-outlet *p*, having a valve *p'*, which may be operated or controlled in any suitable manner to discharge the contents of the chamber *n* when they reach the proper level.

It will be noted that the cross-sectional area of the expansion-chamber *i* is greater than that of the inlet and of the baffle-chamber, so that the steam on passing between the cooling-tubes *e* is expanded in the chamber *i* before it passes to the baffle-chamber *j*.

By arranging the cooling-tubes *e* immediately adjacent to the inlet the steam passes between them directly on entering the separator and before reaching the expansion-chamber, so that the steam is cooled immediately on entering and is then expanded before it reaches the baffles *m*.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. In an oil-separator, the combination of a shell having an inlet and an outlet, a series of baffles located between said inlet and outlet, and water-tubes arranged within the shell transversely in front of the inlet and forming a screen of water-cooled tubes through which the steam passes on entering the separator and before reaching the baffles.

2. In an oil-separator, the combination of a shell having an inlet and an outlet, a series of baffles located between said inlet and outlet, and water-tubes arranged within the shell transversely in front of the inlet and forming a screen of water-cooled tubes through which the steam passes directly on entering the separator and before reaching the baffles, said shell being provided with an expansion-chamber between said water-tubes and baffles, whereby the steam is first cooled and then expanded before reaching the baffles.

3. An oil-separator consisting of an outer body having an inlet and an outlet, and having a baffle-chamber provided with baffles, the interior of the separator between the inlet and baffle-chamber being of larger cross-sectional area than the baffle-chamber and inlet to form

an expansion-chamber for the steam before it reaches the baffle-chamber.

4. In an oil-separator, the combination of an outer shell or body having an inlet and an outlet, and a baffle-chamber adjacent to the outlet formed by two parallel plates k k within the outer shell and baffles m extending between said plates, said outer shell being formed with an internal expansion-chamber i between the inlet and baffle-chamber.

5. In an oil-separator, the combination of an outer shell or body having an inlet and an outlet, a baffle-chamber adjacent to the outlet formed by two parallel plates k k within the outer shell and baffles m extending between said plates the lower plate k being perforated, and a drip-chamber n communicating with the baffle-chamber through an opening o in the base of the shell below the lower perforated baffle-plate k .

In testimony of which invention I hereunto set my hand.

MILLARD P. OSBOURN.

Witnesses:

PHILIP SCHMITZ,
JACOB SCHILLER.