

No. 665,841.

Patented Jan. 8, 1901.

H. TEN WINKEL.
OIL EXTRACTOR.

(Application filed Sept. 28, 1900.)

(No Model.)

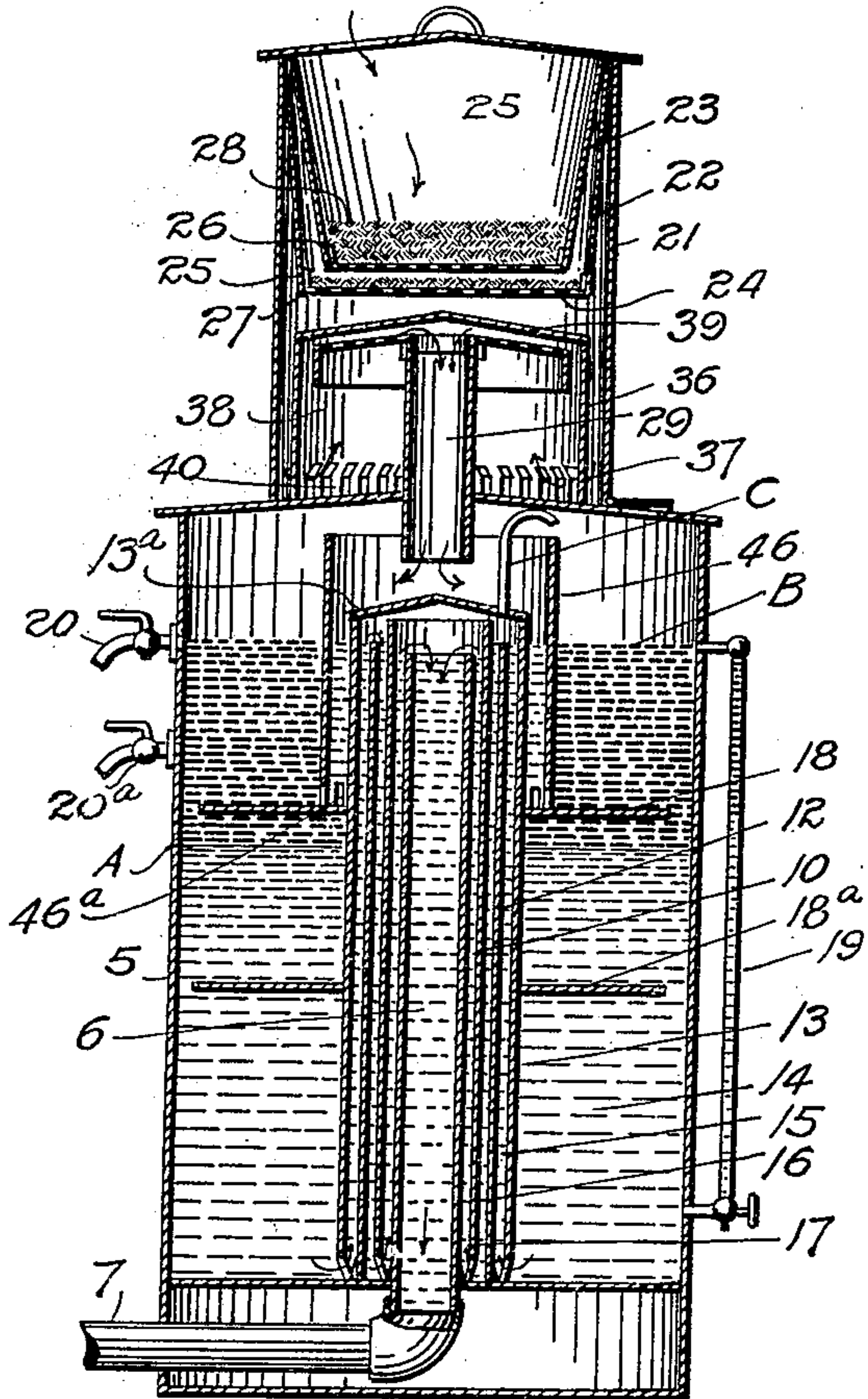


FIG. 1

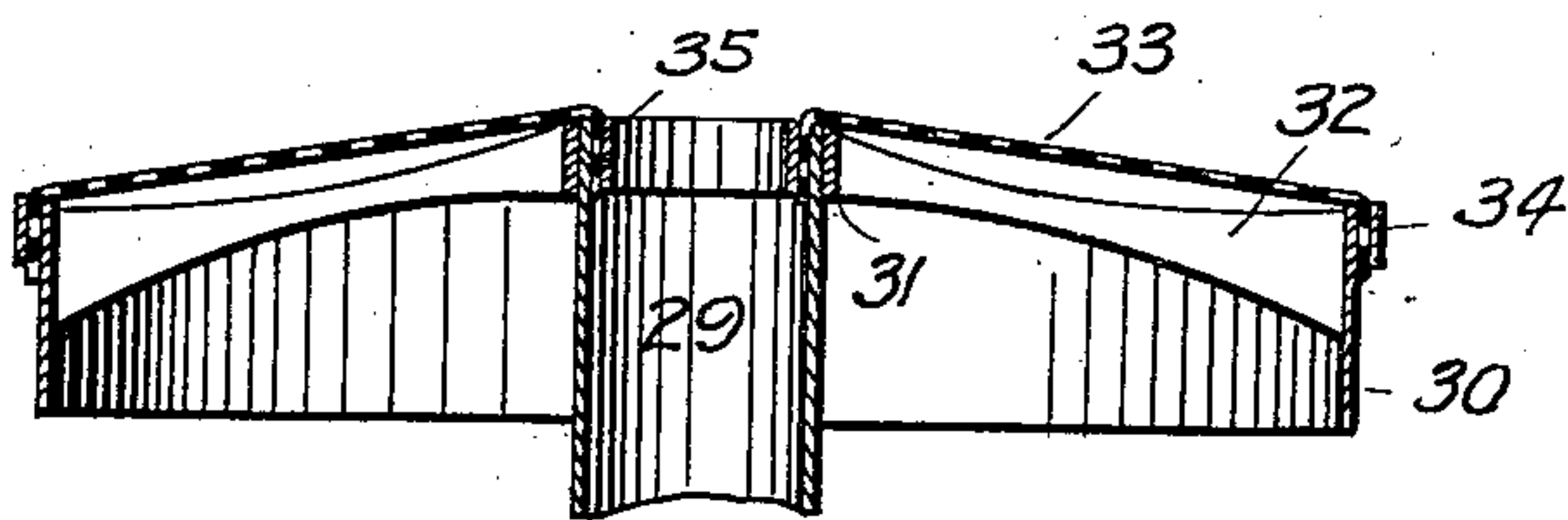


FIG. 2

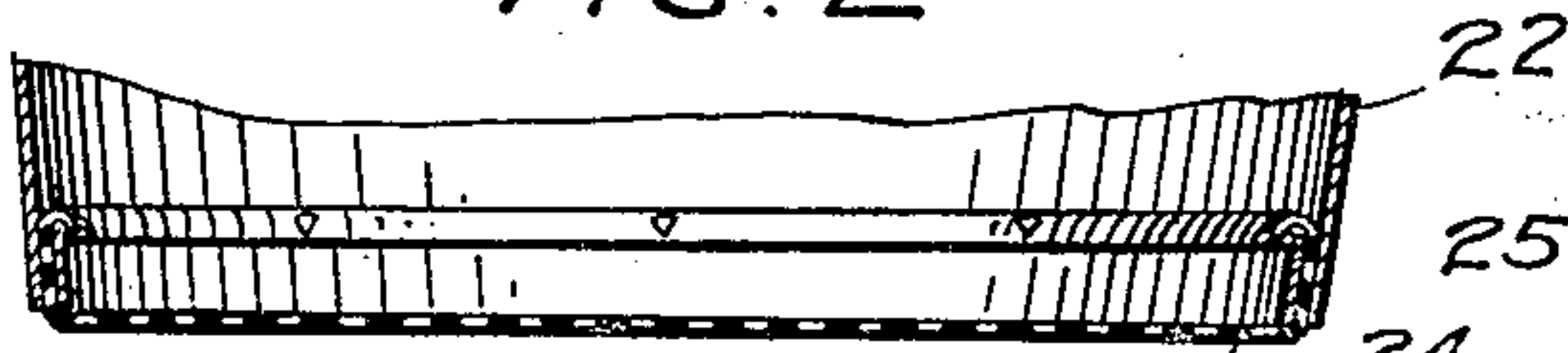


FIG. 3

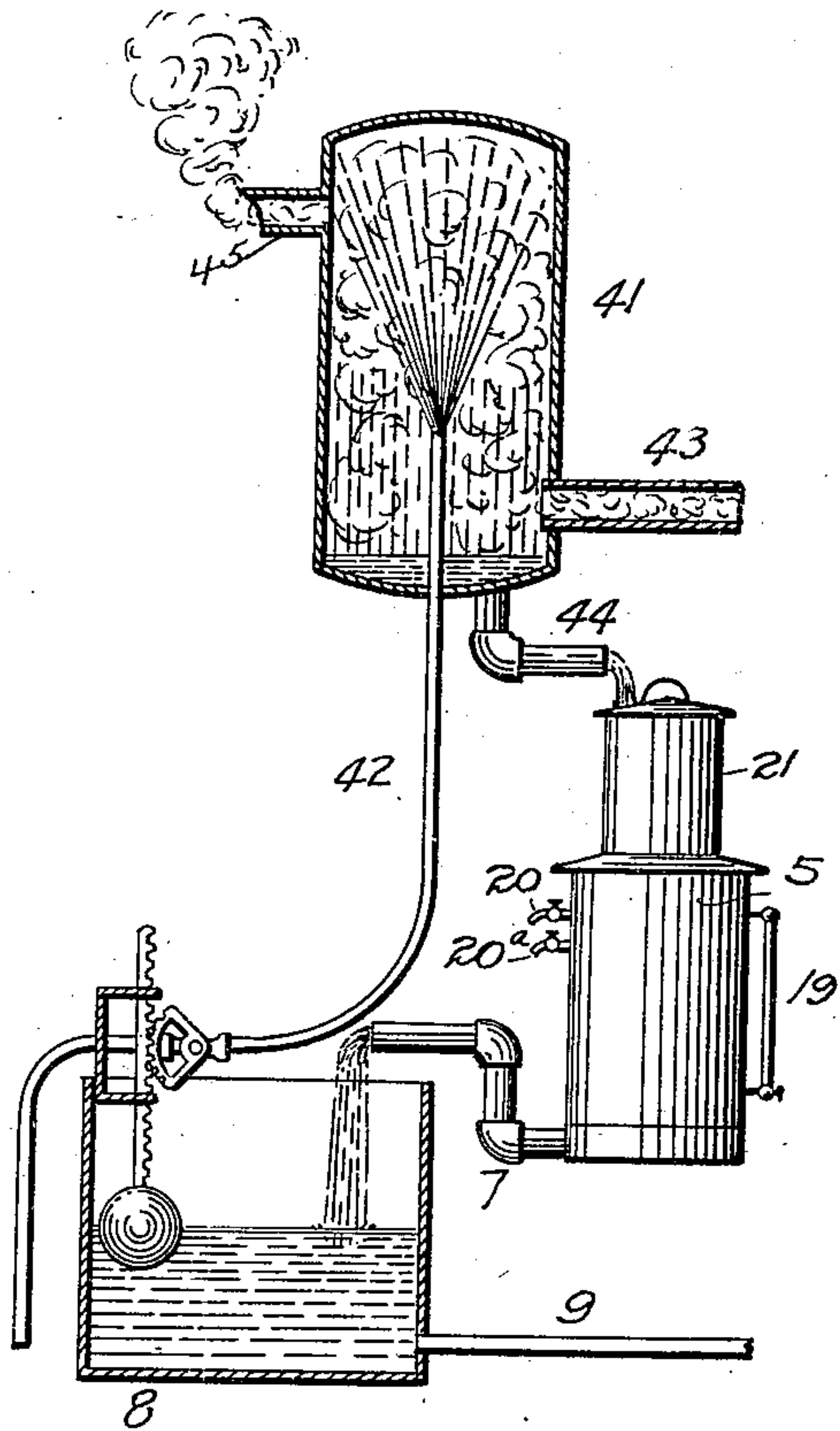


FIG. 4

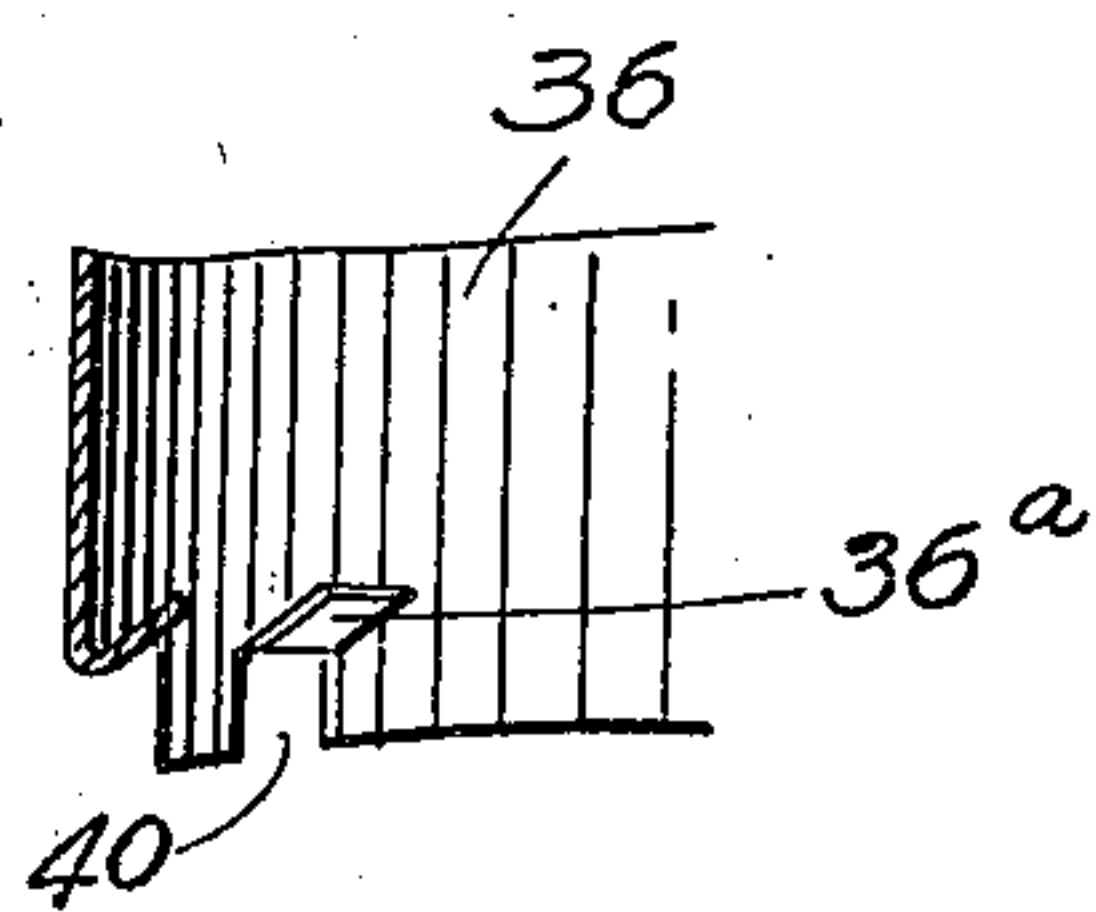


FIG. 5.

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HERMAN TEN WINKEL, OF DENVER, COLORADO, ASSIGNOR OF ONE-HALF
TO DANIEL C. BURNS, OF SAME PLACE.

OIL-EXTRACTOR.

SPECIFICATION forming part of Letters Patent No. 665,841, dated January 8, 1901.

Application filed September 28, 1900. Serial No. 31,368. (No model.)

To all whom it may concern:

Be it known that I, HERMAN TEN WINKEL, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Oil-Extractors; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the characters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in oil-extractors of the class set forth in United States Letters Patent No. 612,791, issued to me October 18, 1898.

My present invention consists of certain improvements or additional features whereby the apparatus is made more complete and efficient; and to these ends the invention consists of the features, arrangements, and combinations hereinafter described and claimed, all of which will be fully understood by reference to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a central vertical longitudinal section taken through my improved apparatus. Figs. 2 and 3 are fragmentary sections illustrating parts on a larger scale. Fig. 4 shows the oil-extractor in use in connection with apparatus for heating the feed-water. Fig. 5 is a fragmentary sectional detail.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a tank having a central inlet-opening in the top and a central discharge-opening at the bottom, into which is fitted a vertical pipe 6, communicating with a conduit 7, through which the pure water passes to a tank 8, whence it is pumped into a boiler (not shown) through a pipe 9. The tank is provided with a number of concentric partitions or tubes 10, 12, and 13 of larger size surrounding the central pipe 6 and dividing the space between it and the wall of the tank into a number of distinct compartments 14, 15, 16, and 17, every alternate tube or partition, beginning with the

outermost, having openings at the bottom, the upper extremity of the outer tube of each compartment extending above the top of the adjacent inner tube, whereby every alternate compartment has an inlet at the bottom and an overflow at the top. In the upper portion of the outer compartment 13 of the tank is located a diaphragm 18, which is attached to the tube 13. This partition does not extend to the outer wall of the tank, a space being left for the liquid to pass freely downward from the upper part of the tank, into which it is discharged. The compartments of the tank are all open at the top to prevent siphonage. A glass gage-tube 19 is attached to the tank to indicate the depth of the water and oil. A faucet 20 is also attached to the tank for the purpose of drawing off the oil.

The foregoing construction is substantially the same as set forth in my aforesaid patent. My present improvements will now be described.

Mounted on the top of the main tank 5 is an auxiliary tank 21, which surrounds the central opening in the top of the main tank. Supported in the upper part of the tank 21 are two receptacles 22 and 23, one within the other, a space being left between them. These receptacles are provided with open-mesh strainer-bottoms 23 and 24. These strainer-bottoms are held in place by rings 25 and 26, the walls of the receptacles being inclined for the purpose. This construction is illustrated in Fig. 3, in which the receptacle 22 is shown. The construction of the strainer-bottom of each receptacle, however, being substantially the same, the showing of one is sufficient for both. The two receptacles 22 and 23 are respectively provided with quantities of filtering material 27 and 28.

In the lower portion of the tank 21 is placed a concentric partition 36, resting on the top of the tank 5 and dividing the space within the tank 21 into two compartments 37 and 38. The partition 36 is closed at the top by a roof 39 and provided with openings 40, surrounding its lower edge and forming a communication between the compartments 37 and 38. In the central opening of the top of the tank 5 is fitted a pipe 29, which extends upwardly into the tank 21 and downwardly into the

main tank or reservoir 5. A skeleton frame composed of outer and inner rings 30 and 31, connected by spider-arms 32, is located in the tank 21, below the roof 39 of the partition 36.

5 The inner ring 31 of the skeleton frame is fitted over the top of the pipe 29, which supports said frame in position. A strainer 33, composed of cheese-cloth or other suitable material, is fastened to the skeleton frame by

10 rings 34 and 35, which clamp the outer and inner edges of the strainer, respectively, the one being outside the ring 30 and the other inside the pipe 29.

As shown in the drawings, (see Fig. 4,) a

15 reservoir 41 is supported above the filtering and oil-extracting apparatus, into which the feed-water from the pipe 42 is forced in the form of spray, where it becomes heated by the exhaust-steam from a pipe 43, which

20 steam is in turn condensed, the condensed steam and heated feed-water being discharged by way of a pipe 44, connecting the bottom of the reservoir 41 with the top of the receptacle 23 of the filtering apparatus. The res-

25 ervoir 41 is provided with an outlet 45 for the escape of the uncondensed exhaust-steam. As the water containing the oil and other impurities enters the receptacle 23 it passes through the filtering material 28, through the

30 strainer 25, through the filtering stratum 27, through the strainer-bottom 24 to the roof 39 of the partition 36, and thence into the compartment 37, through the openings 40 around the bottom of said compartment into

35 the compartment 38, and up through the strainer 33 and down through the tube 29 to the hood 13^a of the tube 13. The upper part of the tube 13 is surrounded by a concentric partition 46, which rests upon the diaphragm

40 18 and is provided with openings 46^a around its bottom, through which the liquid passes into the upper portion of the compartment 14 of the main tank. The water and oil lines are indicated at A and B, respectively. When

45 the oil reaches the level indicated by the line B, it passes off through an open faucet 20. A faucet or cock 20^a, located below the faucet 20, is normally closed, being used only when it is desired to draw off oil from a point

50 below the faucet 20. By reason of the partition 46 all the water is forced beneath the normal plane of the oil, thus preventing any water from becoming mixed with and drawn off with the oil, as might occur if the liquid

55 from the pipe 29 were discharged directly into the oil in the compartment 14 of the main tank. After passing through the opening 46^a the oil rises to the top, while the water passes downwardly through openings in the bottom

60 of the tube 13, upwardly through the compartment 15, downwardly through the compartment 16 through the openings in the bottom of the tube 10, upwardly through the compartment 17 and downwardly through the

65 tube 6, and thence by way of the conduit 7 to the tank 8. While passing through the various compartments in the tank 5, the water

is relieved of its impurities other than oil by sedimentation.

The tubes 6, 10, 12, and 13 are connected 70 with the outer air at their extremities to prevent siphonage by a vent-tube C, inserted in an opening formed in the hood 13^a of the tube 13. An additional diaphragm 18^a is attached to the tube 13 below the diaphragm 18. These 75 diaphragms have a tendency to overcome the movement or agitation of the liquid in the tank, whereby the efficiency of the apparatus is enhanced, and particularly when the device is used on movable structures, as steam- 80 ships.

In forming the openings 40 in the partition 36 the material is cut out and turned inwardly, forming lips 36^a. (See Fig. 5.) These lips divide the liquid as it passes upwardly 85 into the compartment 38 and facilitate the separation of the oil from the water.

Having thus described my invention, what I claim is—

1. The combination with an oil-extractor 90 having an opening in its top, of a filtering apparatus comprising a tank mounted above the oil-extractor, and provided with a pipe passing through the opening in its top, said pipe being open at both ends, a skeleton 95 frame mounted on said pipe, a strainer attached to the said frame, a partition surrounding said frame, resting on the bottom of the tank and having openings in its lower edge, its top being closed, a space being left 100 in the tank around said partition, and a quantity of filtering material supported in the tank above the top or roof of said partition.

2. The combination with an oil-extractor 105 having an opening in its top, of a filtering apparatus comprising a tank mounted above the oil-extractor, and provided with a pipe passing through the opening in its top, said pipe being open at both ends, a skeleton 110 frame mounted on said pipe, said frame being composed of outer and inner rings, connected by spider-arms, a strainer attached to said frame, a partition surrounding said frame, resting on the bottom of the tank and 115 having openings in its lower edge, its top being closed, a space being left in the tank around said partition, and a quantity of filtering material supported in the tank above the top or roof of said partition. 120

3. The combination with an oil-extractor having an opening in the top of its casing, of a filtering apparatus comprising a tank mounted on top of the oil-extractor casing, an open-ended pipe inserted in the opening 125 in the top of said casing, a skeleton frame mounted on top of said pipe, a strainer fast on said frame, a partition surrounding said strainer and projecting above the top of the pipe, said partition being closed at the top 130 and having openings at its lower edge, a space being left between the partition and the wall of the tank, and a receptacle supported in the tank above the roof of the par-

tion and having a strainer-bottom supporting a quantity of filtering material.

4. The combination with an oil-extractor having an opening in the top of its casing, of
 5 a filtering apparatus comprising a tank mounted on top of the oil-extractor casing, an open-ended pipe inserted in the opening in the top of said casing, a skeleton frame mounted on top of said pipe, a strainer fast on said
 10 frame, a partition surrounding said strainer and projecting above the top of the pipe, said partition being closed at the top and having openings at its lower edge, a space being left between the partition and the wall of the
 15 tank, and two receptacles mounted in the tank above the roof of the partition, each having a strainer-bottom, one receptacle being located within the other, a suitable space being left between them, and a quantity of filtering
 20 material in each receptacle.

5. In an oil-extractor, the combination with a main tank containing a central outlet-tube and a tube surrounding said outlet-tube and having a hood at the top, of a diaphragm surrounding and attached to the last-named tube
 25 in the upper portion of the tank, a space being left between the said diaphragm and the wall of the tank, and a concentric partition surrounding the upper portion of the tube, projecting above its hood, extending below
 30 the oil drawn off level in the tank and resting upon the said diaphragm, the top of the tank being provided with an inlet-opening located above the hooded tube.

35 6. In an oil-extractor and filtering apparatus,

the combination with a main tank containing a central outlet-tube and a tube surrounding said outlet-tube and having a hood at its top, a diaphragm surrounding and attached to the last-named tube in the upper
 40 portion of the tank, a space being left between the said diaphragm and the wall of the tank, a concentric partition surrounding the upper portion of the tube, projecting above its hood, extending below the oil-level in the tank, and
 45 resting upon the said diaphragm, the top of the tank being provided with an inlet-opening above the hooded tube, and a filtering apparatus located above the oil-extractor and having its outlet through an opening in the
 50 top of the oil-extractor tank.

7. In an oil-extractor and feed-water heater, the combination with a tank having an inlet-opening at the top, an outlet-opening at the bottom, and intermediate oil-extracting mechanism, of a reservoir mounted above the oil-extractor, an exhaust-steam pipe connected therewith, a feed-water pipe through which
 55 the water is forced into the tank in a spray, an outlet from the tank leading to the oil-extractor, a reservoir for the purified water, and a conduit leading from the oil-extractor outlet to said reservoir.
 60

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

HERMAN TEN WINKEL.

Witnesses:

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 MARY C. LAMB.