Sept. 4, 1928. 1,682,757

R. C. HOPKINS

OIL SEPARATOR

Filed July 27, 1925 2 Sheets-Sheet 1

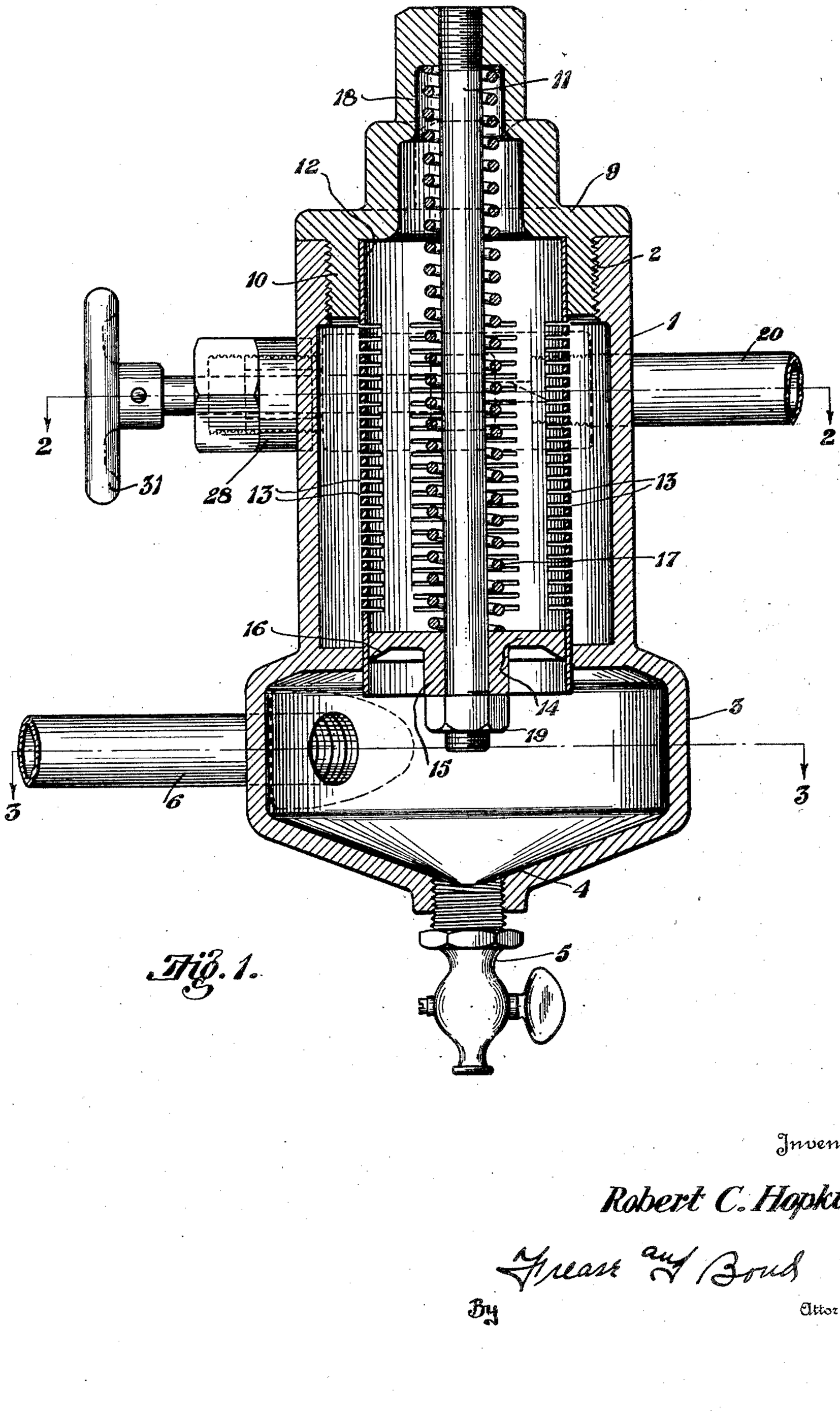

Fig. 1.

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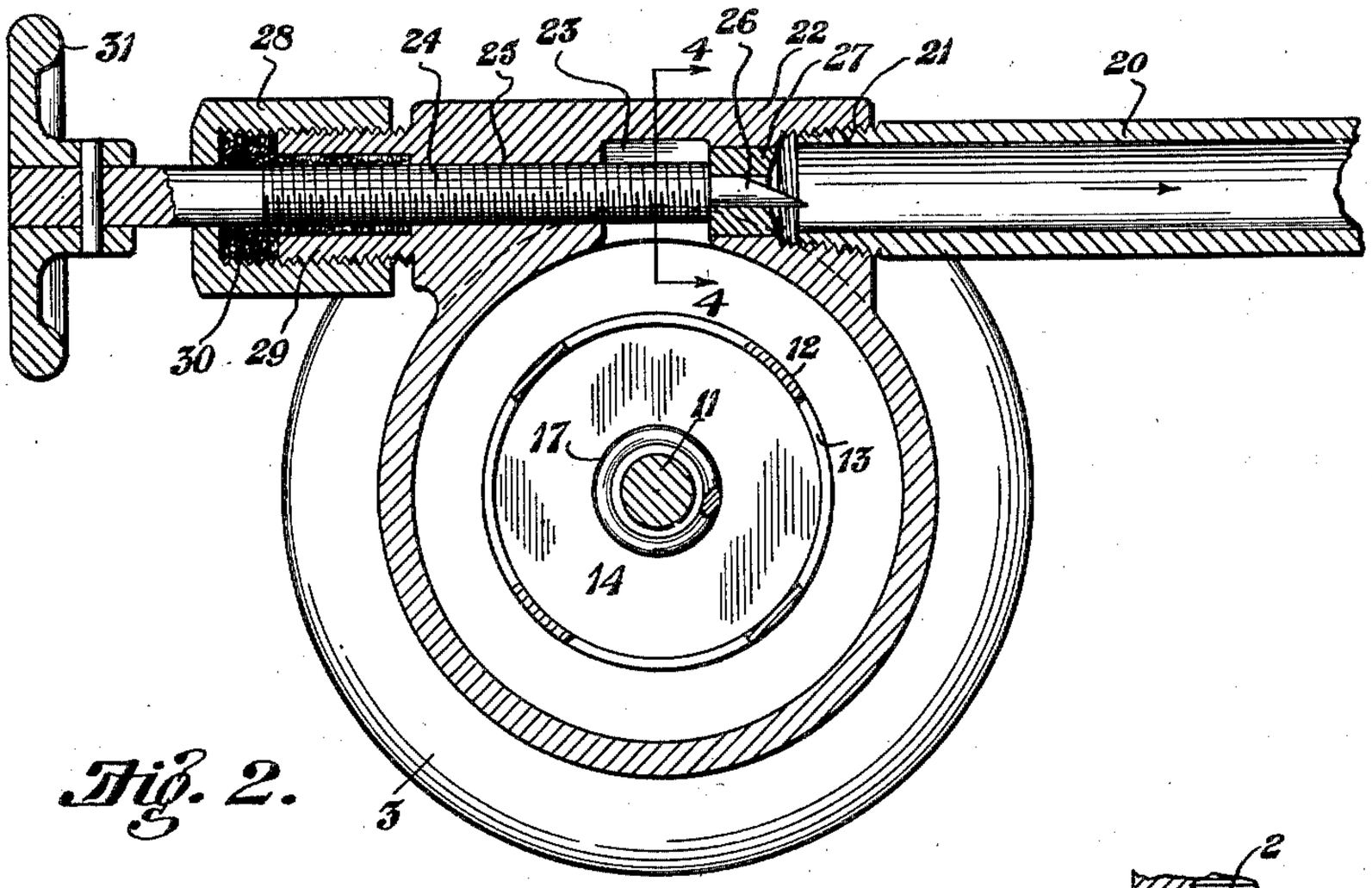

Fig. 2.

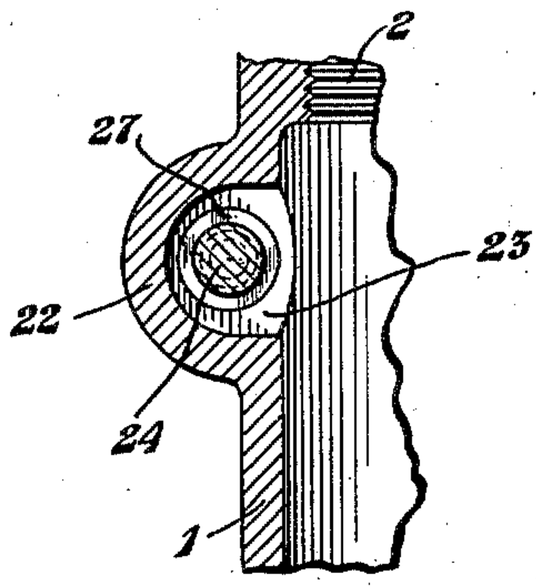

Fig. 4.

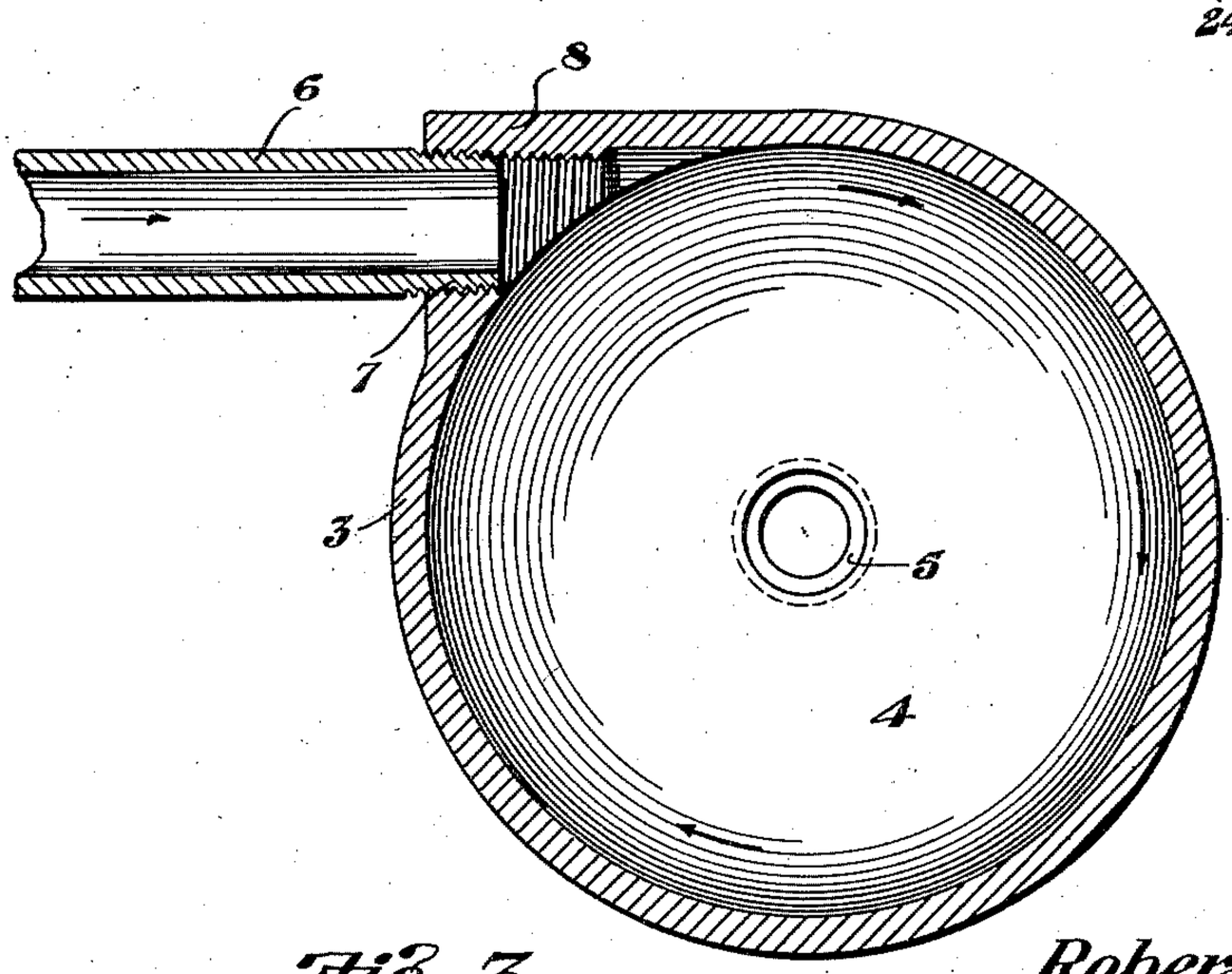

Fig. 3.

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Patented Sept. 4, 1928. 1,682,757

UNITED STATES PATENT OFFICE.

ROBERT C. HOPKINS, OF ALLIANCE, OHIO.

OIL SEPARATOR.

Application filed July 27, 1925. Serial No. 46,378.

This invention relates to separators or precipitators for separating water or foreign matter from oil.

The object of the invention is to provide a separating tank adapted to be located in an oil line and arranged to separate water or sediment from the oil by centrifugal action.

The above and other objects may be attained by providing a cylindrical separating tank having an enlarged settling chamber in its lower end into which the oil pipe extends tangentially, a cylindric slotted screen being suspended axially within the tank and having a spring pressed piston mounted therein, an oil outlet, controlled by a needle valve, tangentially communicating with the upper portion of the separating tank adjacent to the periphery of said screen.

An embodiment of the invention thus set forth in general terms is illustrated in the accompanying drawings, in which,

Figure 1 is a vertical longitudinal section through the improved separating tank;

Fig. 2, a transverse section on the line 2—2, Fig. 1;

Fig. 3, a transverse section on the line 3—3, Fig. 1, and

Fig. 4, a fragmentary section on the line 4—4, Fig. 2.

Similar numerals of reference indicate corresponding parts throughout the drawings.

The separator comprises a cylindrical tank 1 having the internally threaded upper end portion 2 and the enlarged settling chamber 3 at its lower end, preferably provided with the dished bottom 4 provided with the centrally located drain cock 5.

The oil inlet pipe 6, leading from any suitable source of supply, enters the enlarged chamber 3 at a tangent, as best illustrated in Fig. 3, the threaded extremity 7 of said pipe being located in the internally threaded tangential boss 8 provided in the side wall of the tank.

The cap 9, provided with the threaded annular flange 10, is connected to the upper end of the tank 1 and carries the depending axial rod 11. The cylindrical strainer 12 is fixed in any well known manner within the annular flange 10 of the cap and extends downward into the upper portion of the enlarged chamber 3, spaced rows of narrow slots 13 being provided in the walls of said strainer.

A piston 14 is slidably mounted upon the rod 11, by means of the bearing portion 15, and has a sliding fit within the cylinder 12, the lower peripheral edge of said piston being beveled as shown at 16. A coil spring 17 surrounds the rod 11, the upper end thereof being received within the reduced socket 18 in the cap, and the lower end bearing upon the piston 14 and tending to urge the same toward the shoulder or nut 19 adjustably mounted upon the lower end of the rod.

The oil outlet pipe 20 communicates with the upper portion of the tank, being located tangentially thereto, and preferably provided with the threaded extremity 21 received in the internally threaded tangential boss 22 formed upon the exterior of the tank near the upper end thereof. The central portion of this boss is provided with an opening 23 communicating with the interior of the tank, a threaded valve stem 24 being mounted within the internally threaded bore 25 in the boss and having a needle valve 26, preferably beveled as illustrated in Fig. 2, upon its inner end for co-operation with the valve seat bushing 27.

The usual packing gland 28 may be connected to the externally threaded nipple 29, of the boss 22, and provided with suitable packing 30 to prevent leakage around the valve stem, a hand wheel 31 being provided upon the outer end of the stem for the purpose of operating the valve.

As the oil is admitted to the chamber 3, under pressure from the pipe 6, it will be carried around the tank in a swirling movement, centrifugal force throwing the water toward the outside and permitting it to settle by gravity into the settling chamber 3 from which it may be drained off from time to time through the drain cock 5.

As the fluid rises in the tank it will raise the piston 14 in the strainer cylinder, against the pressure of the spring 17, and as it is swirled through said strainer any foreign matter or sediment will be strained through the narrow slots 13 therein. As the piston 14 moves downward in the strainer cylinder the beveled edge 16 thereof will scrape any deposit of sediment or foreign matter from the inside of the strainer, clearing the slots 13.

It should be, of course, understood that although the spring 17 is shown in the drawings for moving the piston 16 downward in the perforated cylinder, any equivalent means, such as a weight, may be provided for the same purpose or, if desired, the piston could be arranged to be moved within the cylinder manually instead of automatically.

I claim:

1. An oil separator including a cylindric tank, an oil inlet pipe entering the lower portion of the tank at a tangent thereto, a perforate cylinder suspended within the tank, an axial rod within the cylinder provided with a shoulder at its lower end, a piston slidable upon the rod and having a beveled edge for contact with the interior of the cylinder, and an oil outlet pipe communicating with the upper portion of the tank at a tangent thereto.

2. An oil separator including a cylindric tank, an oil inlet pipe entering the lower portion of the tank at a tangent thereto, a perforate cylinder suspended within the tank, an axial rod within the cylinder provided with a shoulder at its lower end, a piston slidable upon the rod and having a beveled edge for contact with the interior of the cylinder, a coil spring surrounding the rod and bearing upon the piston, and an oil outlet pipe communicating with the upper portion of the tank at a tangent thereto.

3. An oil separator including a cylindric tank, an oil inlet pipe entering the lower portion of the tank, a perforate cylinder suspended within the tank, a piston slidable within the perforate cylinder and arranged to be raised therein by pressure of the oil within the tank, means for lowering the piston in the tank against the oil pressure, and an oil outlet pipe communicating with the upper portion of the tank.

4. An oil separator including a cylindric tank, an oil inlet pipe entering the lower portion of the tank, a perforate cylinder suspended within the tank, an axial rod within the cylinder provided with a shoulder at its lower end, a piston slidable upon the rod and having a peripheral edge for contact with the interior of the cylinder, and an oil outlet pipe communicating with the upper portion of the tank.

In testimony that I claim the above, I have hereunto subscribed my name.

ROBT. C. HOPKINS.