P. J. GRAHN.

RETURN WATER TANK.

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914,138. Patented Mar. 2, 1909.

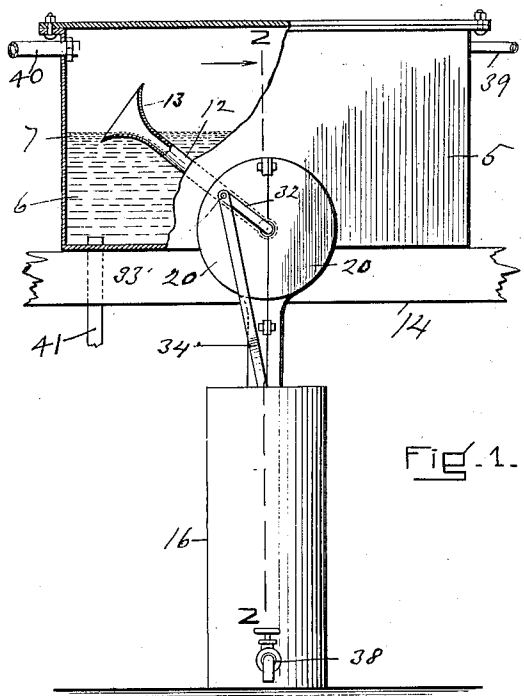


Fig. 1.

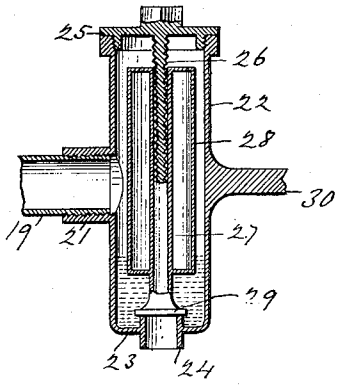


Fig. 3.

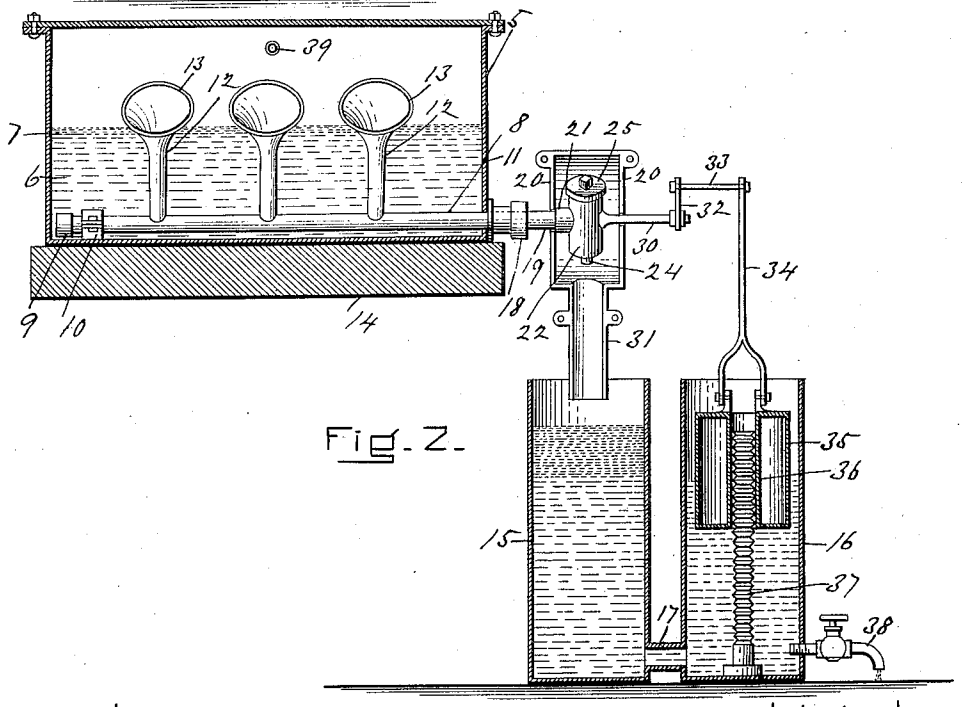


Fig. 2.

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RETURN WATER-TANK.

No. 914,138. Specification of Letters Patent. Patented March 2, 1909.

Application filed October 15, 1908. Serial No. 457,866.

To all whom it may concern:

Be it known that I, PETER J. GRAHN, a citizen of the United States, residing in Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Return Water-Tanks, of which the following is a specification.

This invention relates to return tanks such as are employed in buildings heated by steam, in steam automobiles, and in other situations where water is to be used for the second time and where oil or grease is liable to collect in the tank.

The invention has for its object to provide an improved automatically operating mechanism whereby the oil or grease is collected from the surface of the water and conducted outside the tank, thus obviating any necessity for emptying the tank or box.

The nature of the invention is fully described in detail below, and illustrated in the accompanying drawings, in which:—

Figure 1 is a front elevation of a return water-tank with my mechanism applied thereto, a portion of the front wall of the tank being broken out. Fig. 2 is a sectional view taken on line 2—2, Fig. 1, the view including an elevation of the oil or grease-collectors in the position indicated in Fig. 1. Fig. 3 is an enlarged view in section of the rocking float-mechanism detached.

Similar numerals of reference indicate corresponding parts.

Reference numeral 5 represents a return water-tank, the water being illustrated by the numeral 6, and 7 representing the oil or grease on the surface thereof.

8 represents a horizontal pipe provided with a cap 9 at one end, said pipe having its bearings near one end in the box 10 and near the other end in the end-wall 11 of the tank, whereby the pipe is disposed horizontally in the tank near the bottom thereof, and adapted to rock therein. Extending from and opening into this pipe are the smaller ends for necks of the funnel shaped or trumpet shaped oil or grease collectors 12, the mouths 13 of which operate to collect the grease and oil from the surface of the water in the tank, as below described. The tank is supported preferably by a shelf or table 14. Resting on the floor, or on any suitable surface, are two receptacles 15 and 16 whose interiors are connected by a pipe 17.

The pipe 8 is coupled at 18 to a pipe 19 which extends through one wall of a case 20 adapted to be supported directly over the receptacle 15. Within this case this pipe is rigidly secured at 21 to and connects with the interior of a float-mechanism which comprises a chamber the cylindrical wall of which is numbered 22, and the bottom 23, said bottom being provided with an outlet pipe 24, and the top being provided with a cap 25 from which there extends downwardly and centrally into the chamber a threaded or grooved rod 26. Surrounding this rod and adapted to move vertically thereon is the tubular central portion 27 of a float 28, the opposite ends of which are closed, the tubular portion 27 extending down through the bottom of the float and provided at its lower end with a valve 29 whose seat is on the upper end of the outlet pipe 24. The cylindrical float-mechanism 22 is supported in the opposite walls of the case 20 by means of the pipe 19 and a horizontal extension or shaft 30, and said case 20 is provided at its lower end with a pipe 31 which extends downward into the receptacle 15. Rigid on the outer end of the shaft 30 is a crank 32 whose opposite end is connected by an arm 33 with a bifurcated rod 34 which is connected with a float 35 similar in construction to the float 28, and hanging centrally in the receptacle 16. The tubular central portion 36 of this float surrounds a standard or guide 37 which is threaded or grooved in manner similar to the rod 26.

39 represents an ordinary overflow pipe.

40 and 41 (Fig. 1) represent portions respectively of the inlet pipe or return pipe, and the outlet pipe which leads to and supplies the boiler.

In Figs. 1 and 2 of the drawings the parts are shown in their normal position, and connected with a closed tank 5. Water is placed in the return-tank to the proper height and allowed to flow through the mouths 13 and main portions 12 of the oil-collectors and thence through the pipes 8 and 19 into the cylinder 22. When a sufficient quantity of water has collected in the bottom of this cylinder (see Fig. 3) it lifts the float or trap 28

thus lifting the valve 29 from the seated position illustrated in said figure, and allowing the water to flow through the pipe 24 into the case 20 and through the pipe 31 into the receptacle 15. A sufficient quantity of water flows through the pipe 17 into the receptacle 16 to lift the float 35 until it, with its connections and the water in the receptacle 16 balance the weight of water in the receptacle 15. The faucet 38 is then opened far enough to allow a continuous escape of water estimated to equal in weight the grease or oil entering the return-tank. The machine then works automatically; the oil 7 on the surface of the water enters the mouths 13 which dip sufficiently into the liquid, and flows through the parts 12 of the collectors and through the pipes 8 and 19 into the cylinder 22 holding the valve 29 a trifle off its seat, and thence the oil passes into the case 20 and through the pipe 31 into the receptacle 15 where it collects on the surface of the water. If the inflow of oil equals the outflow of water through the faucet 38, the float 35 remains practically in about the same position, rising or lowering but little. If too much fluid enters the receptacles 15 and 16 the float 35 rises and swings up the crank 32, oscillating the tubular shaft 8 and lifting the oil-collectors 12, 13, reducing the inflow of oil into their mouths. If too much water flows out through the faucet 38, the float 35 drops and pulls down the crank 32 and swings down the mouths 13 of the collectors deeper below the surface, thus drawing off more oil or grease. If the oil at one side of the center of the return-tank becomes skimmed off the surface while that on the other side of the center remains undisturbed, the collectors may be swung over to the other side and operate in exactly the same manner as above described.

When the device is applied to an open supply-tank the float or trap 28 is not needed. I therefore under those circumstances remove the cap 25, take out the float 28 with the valve 29, and return the cap to its original position. The oil then flows through the collectors, the tubular shaft 8 and the pipe 19, into the cylinder 22 and thence through the pipe 24 into the case 20 and thence through the pipe 31 into the receptacle 15. If the supply-tank is a closed one however the float or trap 22 must be employed in order to resist the back pressure, as otherwise the steam would blow through the machine.

The rods 26 and 36 are grooved or threaded, instead of being made smooth, for the reason that it is found in practice that there is less friction when they are provided with threads or grooves like those illustrated, the floats 28 and 35 moving up and down much more easily and freely than on smooth rods.

Any method may be employed for removing the oil from the receptacles 15 and 16, when a sufficient quantity is collected in such receptacles.

The usual overflow pipe 39 is provided on the supply tank, for use in case of emergency or accident.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is:

1. In a return water-tank of the character described, an oscillating tubular shaft disposed horizontally in the tank, oil or grease-collectors opening into and extending up from said tubular shaft and provided with mouths at their upper ends, dipping slightly below said surface, a pair of receptacles, tubular connections intermediate of the tubular shaft and leading to one of said receptacles, a float in the other of said receptacles, and crank-mechanism intermediate of said float and said tubular shaft, whereby the shaft is oscillated by the float and the mouths of the oil-collectors swung upward or downward as a larger or smaller proportion of liquid enters the receptacles.

2. In a return water-tank of the character described, oil or grease-collectors having flaring mouths dipping slightly below the surface of the liquid in the tank, receptacles for receiving the contents of the tank, tubular mechanism leading from the tank to one of said receptacles, a float in the other receptacle, and mechanism intermediate of the float and oil-collectors whereby the mouths thereof are swung upward or downward as a larger or smaller proportion of liquid enters the receptacles.

3. In a return water-tank of the character described, oil or grease-collectors having flaring mouths dipping slightly below the surface of the liquid in the tank, pivotal supports for the oil-collectors whereby they may be swung from one portion of the tank over the pivotal point to the other portion, receptacles for receiving the contents of the tank, tubular mechanism leading from the tank to one of said receptacles, a float in the other receptacle, and mechanism intermediate of the float and oil-collectors whereby the mouths thereof are swung upward or downward as a larger or smaller proportion of liquid enters the receptacles.

4. In a return water-tank of the character described, an oscillating tubular shaft disposed horizontally in the tank, oil or grease-collectors opening into and extending up from said tubular shaft and provided with mouths at their upper ends, dipping slightly below said surface, a pair of receptacles, a case, a pipe extending from the tubular shaft and having bearings in one side of said case, a pipe extending from said case to one of the receptacles, a cylinder within said case and rigid on the pipe having its bearings therein, a shaft extending from said cylinder through

the opposite side of the case, a float in the other receptacle, a faucet secured to the receptacle containing the float, and crank-mechanism intermediate of said float and the shaft extending from said cylinder, whereby the mouths of the oil-collectors swing upward or downward as a larger or smaller amount of liquid enters the receptacles.

In witness whereof I have signed my name to this specification in the presence of two subscribing witnesses.

PETER J. GRAHN.

Witnesses:
HENRY W. WILLIAMS,
M. A. ATWOOD.