

No. 882,195.

PATENTED MAR. 17, 1908.

P. J. GRAHN.  
RETURN WATER TANK.  
APPLICATION FILED NOV. 29, 1907.

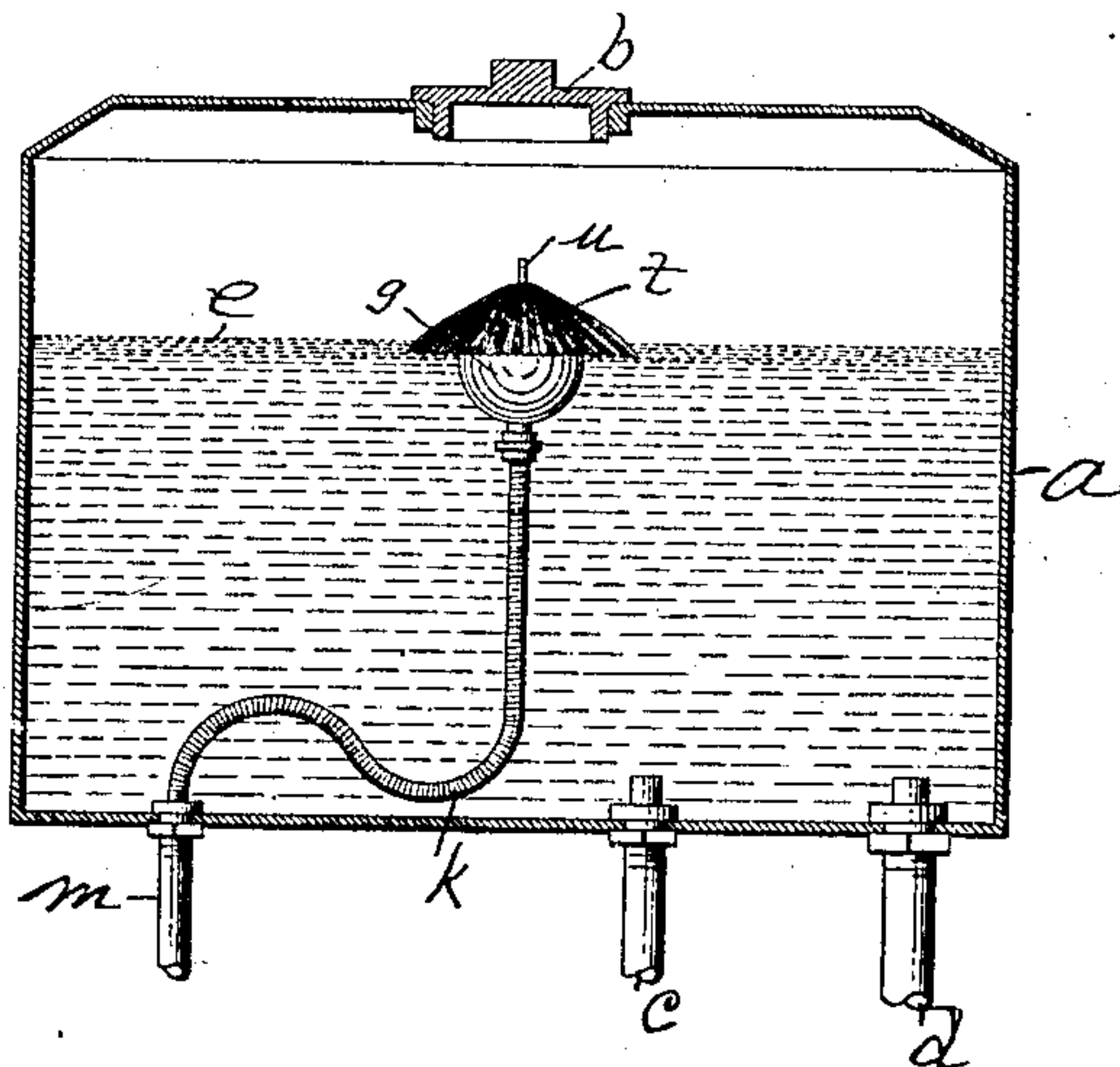


Fig. 1.

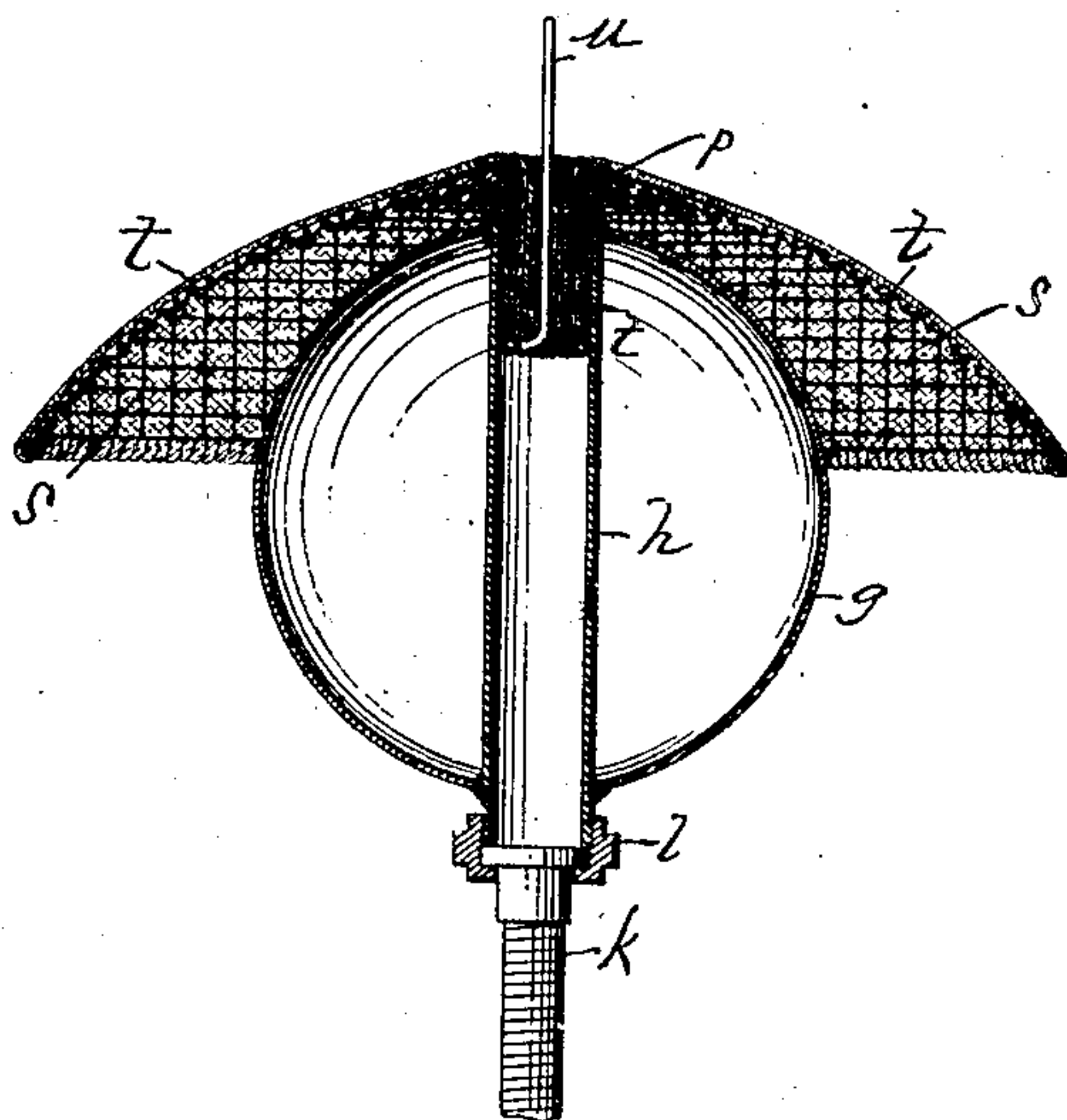


Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## RETURN WATER-TANK.

No. 882,195.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed November 29, 1907. Serial No. 404,267.

*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 steam automobiles, in buildings heated by steam, and to any return tank 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 collect the oil or grease from the surface of the water and to conduct it outside the tank, thus obviating the necessity for emptying the box or tank.

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

Figure 1 is a central vertical section of a return water-tank to which my invention is applied. Fig. 2 is an enlarged vertical section taken centrally through the screen and float.

Similar letters of reference indicate corresponding parts.

*a* represents a return water-tank, *b* being the cap closing the filling-hole, *c* the pipe leading to and supplying the boiler, and *d* the return pipe whereby water (condensed steam) is returned to the tank, and through which oil or grease is liable to enter the tank and rise to the surface of the water *e*.

*g* is a float through which a pipe *h* extends centrally and vertically without impairing the water-tight quality of the float, said pipe extending out beyond the float above and below it. Connected with the lower end of the pipe *h* by a suitable coupling or union *l* is the upper end of a flexible tube *k* which extends down to and connects with an outlet-pipe or escape-pipe *m* leading to the outside of the tank. Supported by and within the upper end of the pipe *h* is a short vertical pipe *p* which operates as a central support to a dome-shaped or concavo-convex screen *s* of wire or equivalent perforated material provided with a central opening and soldered or otherwise suitably secured rigidly at said opening to the pipe *p*, and said screen is covered on its upper surface by a fabric preferably arranged in radial strands, worsted yarn *t* being preferred, the outer ends of the strands being secured to the lower edge of

the screen, and the inner ends being collected in and extending down through the central opening in the screen and pipe *p* and into the upper portion of the pipe *h*. A wire *u* is inserted centrally among said ends, said wire being preferably bent at its lower end into ring or loop shape, thus retaining the central ends or strands in place.

It is of course well known that oil or grease is liable to mix with steam and be carried by the water (condensed steam) to the return tank, collecting on the surface of the water in the tank. In a steam automobile tank, for example, this oil comes from the condenser. In a tank provided with my invention the oil, in conformity with a well known law, moves toward and becomes attached to the worsted yarn *t* on the screen *s*, and is absorbed by said screen and moves up along the strands, either by capillary attraction or by siphonic action, and is thereby conducted by said strands into the downwardly extending pipe *p* and dropped from the inner ends of the strands through the pipe *h* into the flexible tube *k*, by which it is conducted into the outlet or escape-pipe *m* outside the tank. By this means the oil or grease is absorbed and conducted out of the tank nearly or quite as fast as it appears on the surface of the water, and before there is any opportunity for the mineral in the oil to sink to the bottom of the tank. Thus the tank is constantly being freed of the oil on the surface of the water and the mineral in the oil is not allowed to be pumped into the boiler where it will get into the tubes and cause the boiler to "burn". Of course if there were no oil on the surface of the water the water itself at the surface would gradually be absorbed by capillary attraction, and no harm would be done, but in practice the oil is constantly collecting on the surface of the water and being taken up by the yarn in the screen and conducted down into the pipe *h*, so that there is very seldom any noticeable absorption of the water.

A perforated screen is employed in order that the water may reach the worsted yarn from above and below it, that is, from the inner or outer side of the dome-shaped screen. A flexible tube is used in order that the device can be applied to any return tank where water is to be used the second time, and connect with an escape-pipe wherever located in the tank. I prefer what is known in the trade as flexible metallic tubing, a



tubing consisting of a helically wound ribbon made usually of copper or copper and steel, and sufficiently flexible to rise and fall with the float.

5 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, a float, a substantially vertical  
10 pipe extending through said float without being connected with its interior, a screen supported by the float and provided with a central opening connecting with the upper  
15 end of said pipe, a series of pieces or strands of yarn arranged substantially radially on the screen and with their inner ends extending down into the upper end of the pipe, and a tube connecting the lower end of said pipe with the outlet-pipe of the tank, for the pur-  
20 pose set forth.

2. In a return water-tank of the character described, a float, a substantially vertical

pipe extending through said float without being connected with its interior, a dome-shaped screen provided with a central open- 25 ing, a short tube connecting the said opening with the upper end of said pipe, a series of strands of yarn arranged substantially radially on the screen and with their inner ends extending down through said opening and 30 tube into the upper portion of the pipe, a flexible tube connecting the lower end of the pipe with the outlet-pipe of the tank, and a small rod extending down through and among the inner ends of the strands in the upper 35 portion of the pipe, for the purpose set forth.

In testimony 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.