

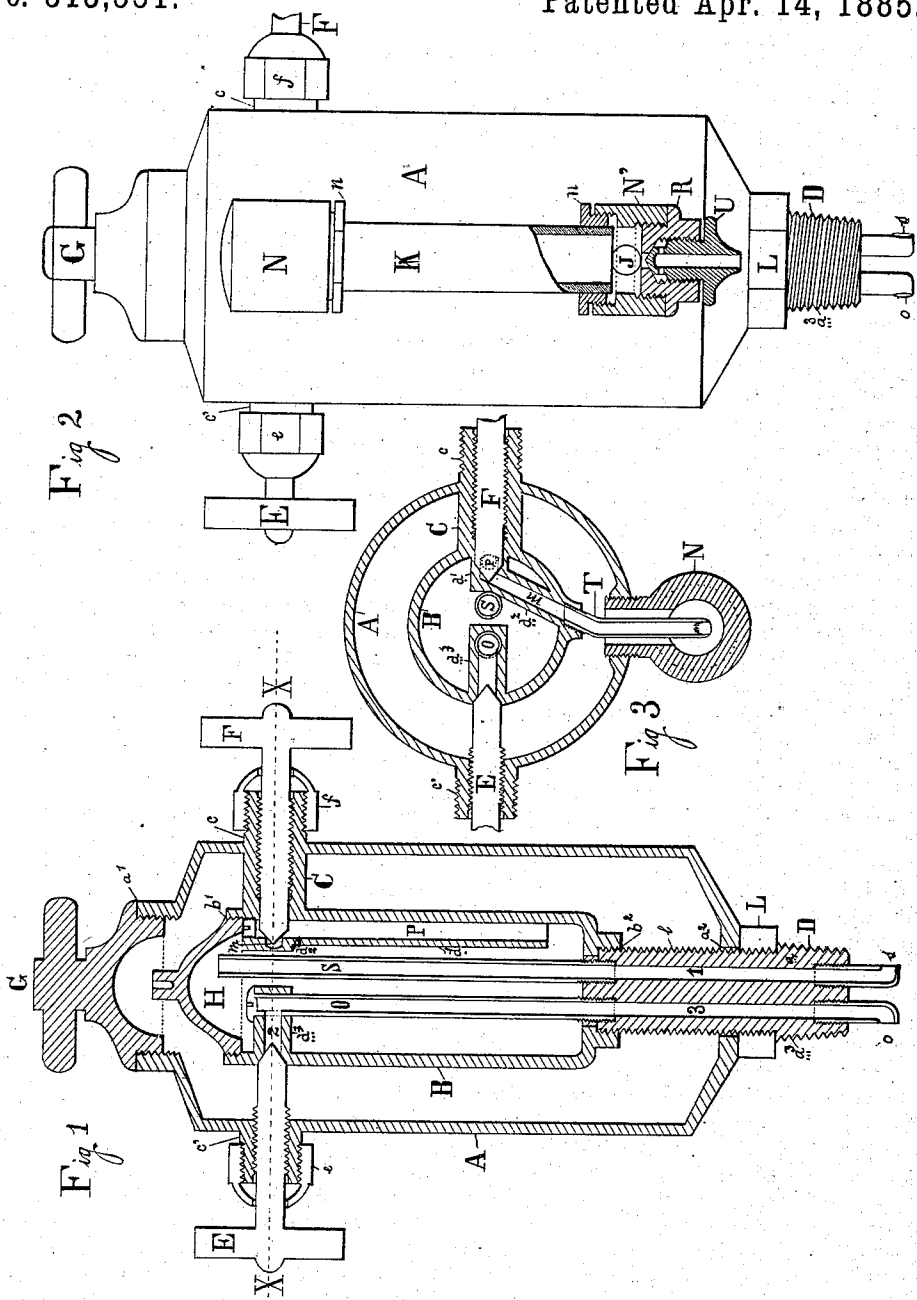
(No Model.)

F. J. RENCHARD.

LUBRICATOR.

No. 315,551.

Patented Apr. 14, 1885.



Witnesses:

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UNITED STATES PATENT OFFICE.

FRANCIS J. RENCHARD, OF DETROIT, MICHIGAN.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 315,551, dated April 14, 1885.

Application filed November 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS J. RENCHARD, of Detroit, in the county of Wayne and State of Michigan, have invented a new and useful Improvement in Lubricators, of which the following is a specification.

My invention relates to that class of lubricators in which the oil is supplied in limited quantities as it is displaced by water, the product of condensation being admitted to the oil-chamber in carefully-regulated quantities.

It has for its object the production of a compact and cheap apparatus which may be attached directly to the top of a horizontal steam-pipe, or to the top of the steam-chest or other part to be lubricated; and it consists in the use of an internal water and steam chamber and an exterior oil-chamber cast in one piece and connected by such pipes, and combined with such valves as permit the regulated introduction of water to the oil-chamber and the overflow of oil from its chamber to flow directly downward to the point to be lubricated.

In the annexed drawings, making part of this specification, Figure 1 is a vertical section. Fig. 2 is an elevation, partly in section. Fig. 3 is a horizontal section on the line $x x$ of Fig. 1.

The same letters are employed in all the figures in the indication of the identical parts.

The external cylinder, A, and the internal cylinder, B, are concentric and cast in one piece, being united by the neck C, extended to the outside in the stud c . Opposite to the latter, and projecting in like manner beyond the cylindrical shell A, is the stud c' , these studs being bored out and threaded internally to receive the threaded stems of the valves E and F, and externally to receive the correspondingly-threaded stuffing-boxes e and f . The cylindrical shell A is closed at the top by the screw-plug G, and at the bottom by the vertical tubular plug D, which contains two parallel ducts, 1 and 3, and is inserted into the opening a^2 in the bottom of the cylinder A, and tapped into threaded annular flange b^2 on the lower end of internal cylindrical shell, B. The jam-nut L, set firmly against the end of cylinder A, holds the plug D in place and packs the joint between the plug and the cyl-

inder. The lower end of the plug D has cut upon its periphery a thread of coarser pitch than that of the plug at l , and by this the lubricator may be attached to a horizontal steam-pipe, or to the top of the steam-chest or other part to be lubricated. The cylindrical shell B is closed at the top b' by the screw plug or cap H, and at the bottom by the plug D, which forms the standard or support for the entire apparatus. It has at the top a stud, d^3 , bored with a horizontal tube, 2, the end of which forms a seat for the valve E, and a perpendicular hole to receive the connecting-pipe O, which leads from tube 2 inside the valve-seat to the duct 3, and thence to the discharge-orifice o . The pipe O is closed at its upper end, and has its lower end tapped into the upper end of plug D at the upper end of the duct 3. Another vertical pipe, S, opens near the top of the chamber, and is tapped into the end of the plug D at the upper end of the duct 1, terminating below in the orifice s . Another tube is formed within the shell B by boring a hole, P, through the projection d' , formed by thickening the shell at that point in casting. This duct P leads from near the bottom of the chamber to the branch pipe m , (being closed at the top,) with which its communication may be cut off or opened more or less by the adjustment of the valve F. The pipe m communicates by means of the pipe T with the interior of the indicator-glass K, which is a glass tube held between glass holders N and N' and made tight by the packing-rings $n n$. The lower glass holder, N', communicates with the interior of the chamber A by the tube J, and with the open air when the drain-valve U is withdrawn from its seat, so as to allow the contents of chamber A to flow out through a duct formed in the middle of valve-stem and connected with the outside by holes opening into a recessed chamber around the upper end of the stem and immediately below the seat.

The apparatus thus constructed is operated as follows: The plug or standard D being tapped into the steam-pipe or steam-chest, the plug G being removed, oil is poured in to fill the external chamber, A, when the plug is replaced. When steam is admitted to the pipe or chest, it will rush in through the orifice s and pipes 1 and S and fill gradually the interior

chamber, B, with water, the product of condensation. If, now, the valve F is slightly opened, this water will flow up the duct P, past the valve, and through the pipes *m* and T, into the interior of the indicator-glass K. As this glass has an open communication through J with the interior of the chamber A, the oil will stand in the indicator-glass at the same level as in the chamber, and the water, coming through *m* T and falling onto the oil, will sink through the same in visible quantities, and the valve E having been opened will displace an equal quantity of oil, which, escaping through the pipe 2, will flow down the tubes O and 3 and be discharged through the orifice *o*. By this means oil may be supplied to the part to be lubricated in quantities regulated at the will of the operator, and as it descends through the oil the water will be visible and indicate to the eye the rate at which the oil is being fed. As the apparatus is placed immediately over the place where its work is to be performed, all its operations are performed by the direct force of gravity and with a minimum of loss.

The steam and water chamber B being placed in the interior of the oil-chamber and in constant connection with the steam-boiler when the apparatus is at work, it follows that the oil will be maintained in a state of fluidity.

While I have presented the apparatus in the best form known to me, it is manifest that it may be modified in form and yet retain the essential principle of operation. Thus it is not essential that the steam and water cylinders should be entirely inclosed by the oil-cylinder, as the oil can be maintained in a liquid condition under ordinary exposure without such entire inclosure. So the feed will be continued in the same way, although the tube K may be opaque and the position of the valve and pipes may be changed; nor is it essential that the two cylinders should be cast in one piece, though that is the cheaper way to make them, and other changes may be made, still retaining the practically-essential features of my invention by which it is distinguished from others before known—viz., an oil-chamber inclosing a steam and water chamber to such an extent as to maintain the fluidity of the oil under ordinary conditions of exposure, the ducts and valves controlling the outflow of water and of the oil as it is displaced by the water.

I am aware that a steam-induction pipe leading to a water and steam chamber placed

above the oil-chamber has been used as a means for heating the oil by passing the steam through the oil-chamber, and I disclaim such construction, from which my invention is distinguished in this that, instead of the steam-induction pipe, I place the condensation-chamber itself within the oil-chamber and inclose it entirely (except as stated) within the oil-chamber, the two as well as the transparent tube being in the same plane, thereby reducing by one-half the length of the apparatus and bringing it into more convenient dimensions.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A lubricator having an oil-chamber surrounding and inclosing an interior steam and water chamber, in combination with a transparent tube filled normally with oil, through which the water falls in visible quantities in its course from the water-chamber to the bottom of the oil-chamber, substantially as set forth.

2. In combination with an exterior oil-chamber, an interior water and steam chamber, a valve, F, and tube for admitting water from the latter to the former in regulated quantities, and a tube for discharging oil from the upper part of the oil-chamber as it is displaced by water introduced into said chamber, substantially as set forth.

3. The exterior oil-chamber and interior water and steam chamber cast in one piece and connected by the neck C, substantially as set forth.

4. The combination of an exterior oil-chamber, A, an interior water and steam chamber, B, and the plug D, connecting the two, and also forming a standard to support them both at the same time that it forms an extension of the interior pipes, S and O, substantially as set forth.

5. The combination of the exterior and interior chambers A and B, the plug D, connecting the two, the steam and oil pipes 1 S and 3 O, the water-pipe P, and valves E and F, arranged in relation thereto, substantially as set forth.

As witness my hand executed in the presence of two subscribing witnesses.

FRANCIS J. RENCHARD.

In presence of—

WILLIAM MAY,
JOHN MARSHALL.