

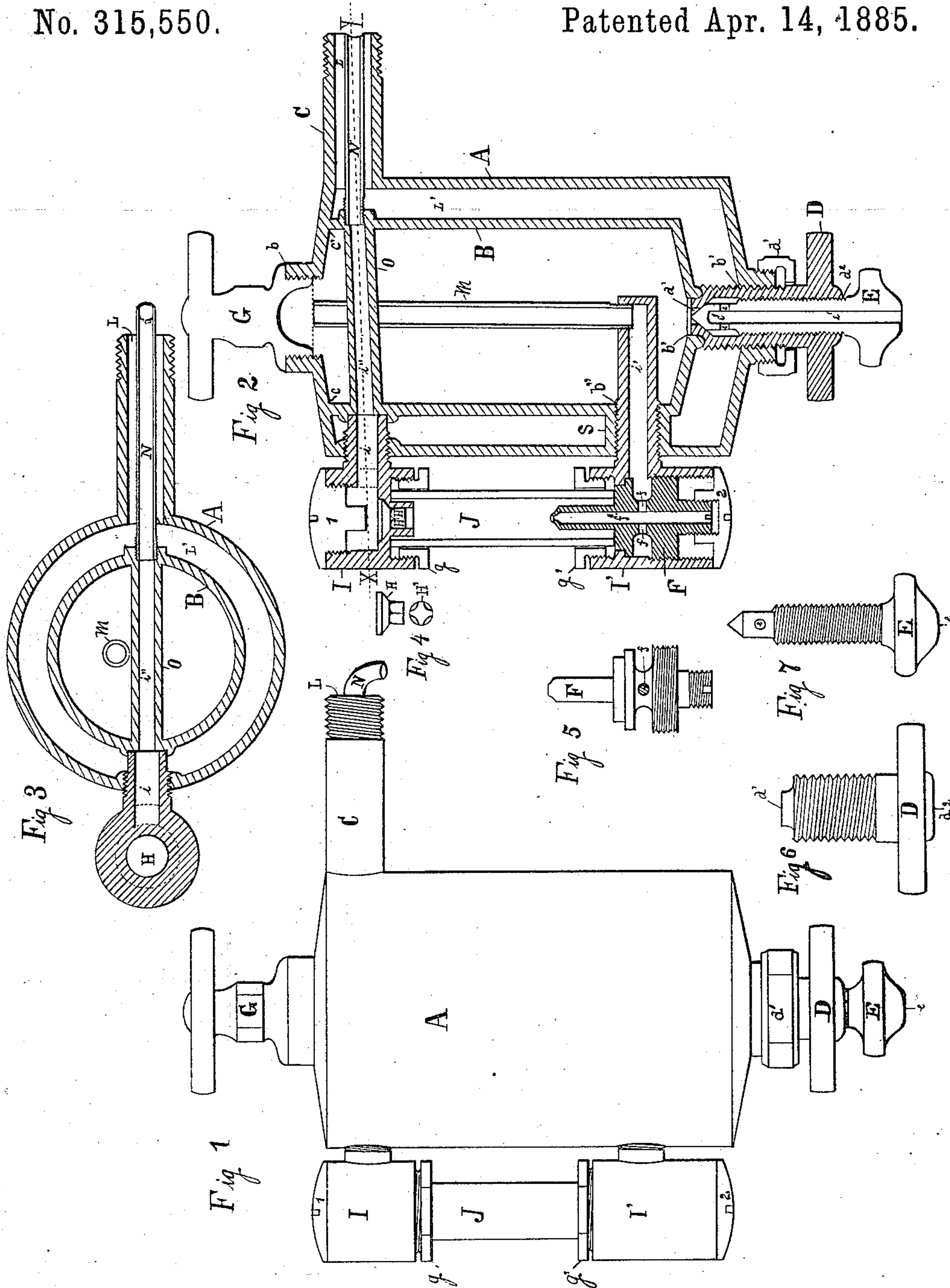
(No Model.)

F. J. RENCHARD.

LUBRICATOR.

No. 315,550.

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. 315,550, 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 belongs to that class of lubricators in which the oil is caused to rise in visible quantities through water contained in a transparent tube by means of the action of water, the product of condensation, which displaces the oil in a reservoir connected with said transparent tube.

My invention consists, primarily, in locating the oil-reservoir of a lubricating apparatus within an inclosing water-chamber containing water, the immediate product of condensation from steam directly introduced thereto, whereby a heat is maintained sufficient to keep the oil in a constant state of fluidity; and, secondarily, it consists in special arrangements of the integral parts whereby the construction of the apparatus and its operation are facilitated.

In the annexed drawings, making part of this specification, Figure 1 is an elevation of the apparatus. Fig. 2 is a vertical section thereof. Fig. 3 is a horizontal section on the line *xx* of Fig. 2. Fig. 4 represents the check-valve in elevation, and also by an inverted horizontal section. Fig. 5 is an elevation of the oil-director detached; Fig. 6, a similar elevation of the regulating-valve, and Fig. 7 a similar section of the drip-valve.

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

The oil and water chambers are composed of two concentric cylinders, A and B, of which the exterior chamber, A, is the water-chamber, and the interior chamber, B, is the oil-chamber.

Water, the product of condensation, is obtained by means of the tubular extension C, which is cast in one piece with chamber A, and forms a steam-connection between the latter and the steam-pipe, from which steam enters the chamber A, and is then condensed.

Within the chamber A is the chamber B, preferably cast in one piece, their walls being connected at *c c'*, and by the tubular neck S, through which a pipe, *i'*, is tapped, connecting a vertical pipe, *m*, which extends nearly

to the top of the oil-chamber with the interior of the transparent indicator-glass J.

The indicator-glass is filled with water, and is supported between the upper and lower glass-holders, I I'. The upper glass-holder, I, is a tubular piece, closed above by the screw-plug 1, and below by the packing-ring *g*, which incloses the upper end of the glass-tube J and seals the same. It is also provided with a diaphragm, which forms a valve-seat and cage for the check-valve H, which has grooved passages cut in the face of its stem, to permit the oil to flow from the indicator-glass into the interior of the glass-holder I, which communicates with the escape-tube *i*, cast, preferably, in one piece with I and tapped through the external wall of the water-chamber A. The screw-plug 1 is formed with a projection on its lower face, which acts as a stop, limiting the rise of the check-valve H, and preventing its falling out of its cage after the apparatus has been put together. The tube *i* discharges into the tube *i''*, which is bored in a stem or bar, O, which extends across the oil-chamber, and this in turn discharges into a pipe, N, placed within the tubular extension C, and discharging the oil into the steam-pipe. The lower glass-holder, I', is also a tubular piece, closed below by the screw-plug 2, and above by the packing-ring *g'*, which incloses the lower end of the glass tube J and seals the same. It is preferably cast with an induction-tube, *i'*, which is tapped through the neck S, and extends into the interior of the oil-chamber B, and is connected with the vertical supply-pipe *m*. The interior face of this glass-holder is formed with a spiral thread to receive the plug F, which has a corresponding thread cut upon its exterior face, and another thread formed on the downwardly-projecting stem to receive the corresponding thread cut on the inner face of a projection from the center of the screw-plug 2. The plug F is the oil-director, taking the oil from tube *i'* by means of an annular recess communicating with the holes *f f*, opening into the internal tubular chamber, *f'*, which terminates at the top with a small orifice opening into the interior of the glass tube J. This lower glass-holder is also formed with an annular flange to receive the shouldered flange surrounding the plug F above the holes *f f*, and forming a



stop, cutting off all communication between the interior of the indicator-glass J and the oil-chamber except through the holes *ff* and tube *f'*.

- 5 G is a screw-plug closing the mouth of the oil-chamber B.

The admission of water to the interior of the oil-chamber is regulated by the regulating-valve D, which is tapped through the bottom of the water-chamber at *b*<sup>2</sup>, and fitted to bear against the seat formed on the lower end of the oil-chamber B by an annular flange. A stuffing-box, *d'*, prevents the escape of water.

To permit the chamber B to be emptied, the stem of valve D is made hollow, and a valve-seat is formed at the upper end, where the hole through D opens into the interior of chamber B, and a female screw is cut on the interior face to receive a corresponding thread upon the periphery of the drip-valve E, which may thus be screwed into the center of the regulating-valve D. An annular chamber is also formed immediately below the valve-seat *b'* by cutting away the stem of valve E, and holes are bored at *ee*, connecting such annular chamber with the tube *e'*, which extends from the holes *ee* to the lower end of the drip-valve. The drip-valve is formed with threads of much less pitch than the corresponding threads of the regulating-valve D, which permits it to be easily opened without disturbing valve D.

The operation of this lubricator is as follows: The apparatus is connected with the steam-pipe of an engine by the tubular extension C, which is screwed into a hole tapped through the steam-pipe, the pipe N extending into the interior of the steam-pipe. Steam will enter through the space L into the interior of the chamber A, and be therein condensed, filling the chamber in whole or in part with water. The screw-plug G being then removed, water may be poured into the pipe *m* until the indicator-glass J is full, when the oil-chamber may be filled with oil and the plug G screwed in. If, now, the regulating-valve D is slightly opened, the chamber A being filled with water and steam, the water will flow into the chamber B, lifting the oil and forcing it into pipe *m*, when, driving the water before it into the indicator-glass J, and thence through the check-valve H into the steam-pipe, it will follow until the connected pipes *m*, *i'*, and *f'* are full of oil, and then the oil will rise drop by drop through the water in the indicator-glass, and thence through the check-valve into the tube *i*, *i*<sup>2</sup>, and N into the steam-pipe, the greater or less flow depending upon the adjustment of the valve D. When the oil has been discharged from the chamber B, the valve D must be closed and the drip-valve E opened. This will permit the water to flow out of chamber B. The valve E being then closed, the chamber may be again filled with oil, and as the pipe *m* is full of oil, the work of feeding oil to the steam pipe or cylinder will be resumed as soon as valve D is again opened.

It will be observed that as the oil-chamber is exposed to the heat of the steam and water in the exterior and inclosing chamber A, the oil will be maintained in a state of fluidity.

I have described my lubricator as being attached and the oil supplied to the steam-pipe. It is evident, however, that the pipe N may be led into the interior of the cylinder or to other part to be lubricated. I have illustrated my invention in what I consider its best embodiment; but it is evident that considerable variations may be made in details without departing from the principles of my invention. Thus the use of an indicating-glass, however convenient, is not indispensable. So, also, it is not essential that the oil-chamber should be entirely inclosed in the steam and water chamber, nor that the regulating and drip valves should be united, as set forth, as the same end can be accomplished by independent and distinct valves. So, also, the regulating-valve need not open into the bottom of the oil-chamber, since the water will sink below the oil even if it is introduced above the bottom of the chamber.

What I regard as the practically essential elements of my invention, and as that which distinguishes it from those before known, are the oil-chamber inclosed by the water and steam chamber, with such a degree of exposure of the oil to the heat of the steam and water as will maintain its fluidity under ordinary conditions of exposure, a valve which regulates the flow of water into the oil-chamber to displace the oil, a pipe leading from the oil-chamber, and a drip for the purpose of drawing off the water when the oil-chamber is to be recharged with oil.

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

1. A lubricator having an oil-chamber surrounded and inclosed by an exterior chamber for water and steam, in combination with a transparent tube through which the oil passes in visible quantities in its course from the oil-chamber to the part to be lubricated, substantially as set forth.

2. In combination with an interior oil-chamber, B, an exterior water and steam chamber, A, a valve, D, for admitting water from the latter to the former in regulated quantities, and a tube for discharging the oil from the upper part of the oil-chamber as water is introduced at the bottom of the oil, substantially as set forth.

3. In combination with an exterior and interior chamber, A and B, the tubular regulating-valve D, determining the communication between the two, and the central valve, E, for exhausting the contents of the interior chamber through the exterior chamber, substantially as set forth.

4. The combination of the external chamber, A, the internal chamber, B, the glass-holders I I', the intermedial indicating-glass, J, and the induction and discharge pipes *i' i*, substantially as set forth.



5. A lubricator combining in its construction an oil-chamber and a steam and water chamber arranged in the same plane and separated by a single partition, through which heat may be transmitted from the steam and water to the oil, together with valves and pipes for transmitting the water to the oil-chamber in regulated quantities to displace the oil, substantially as set forth.

In testimony whereof I have hereunto signed my name in presence of two subscribing witnesses.

FRANCIS J. RENCHARD.

Witnesses:

WILLIAM MAY,  
JOHN MARSHALL.