No. 814,147. PATENTED MAR. 6, 1906.

F. C. LE MESSURIER.

LUBRICATOR.

APPLICATION FILED JUNE 3, 1905.

Fig. 1.

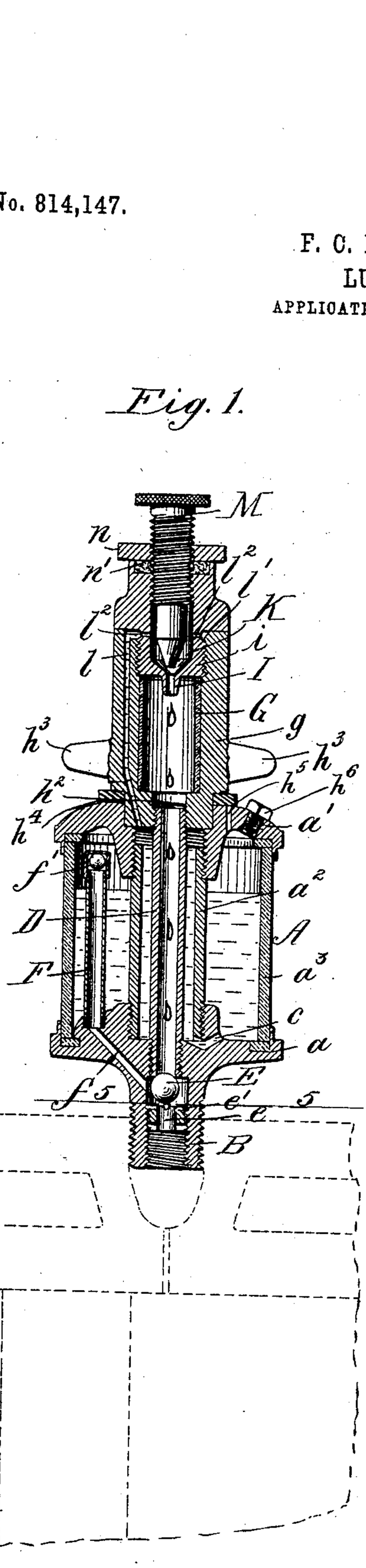


Fig. 2.

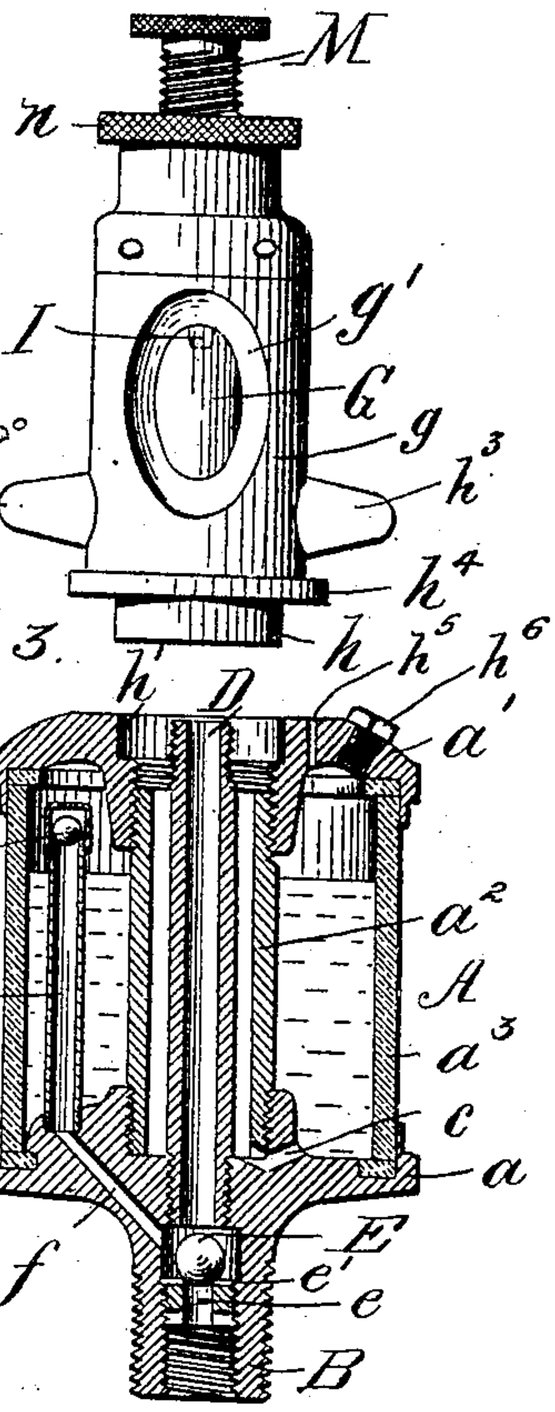


Fig. 3.

Fig. 5.

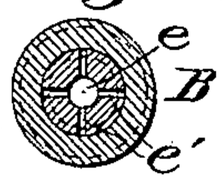
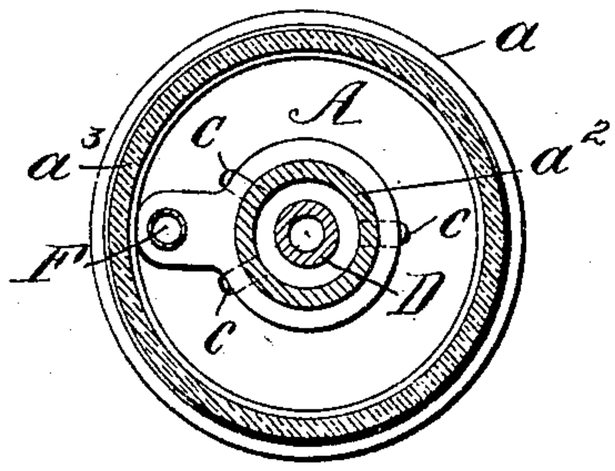


Fig. 4.



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UNITED STATES PATENT OFFICE.

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LUBRICATOR.

No. 814,147. Specification of Letters Patent. Patented March 6, 1906.

Application filed June 3, 1905. Serial No. 263,553.

To all whom it may concern:

Be it known that I, FRANK C. LE MESSURIER, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Lubricators, of which the following is a specification.

This invention relates more particularly to a force-feed lubricator adapted for lubricating the cylinders of explosive gas-engines and air-compressors; and the lubricator is of that kind in which the lubricant is fed positively through a sight-feed tube by the alternate pressure and suction incident to the operation of the engine.

The object of the invention is to provide an efficient and desirable lubricator of this type which is of simple, compact, and inexpensive construction.

In the accompanying drawings, Figure 1 is a vertical sectional elevation of a lubricator embodying the invention and showing the same applied to the cylinder to be lubricated, which is indicated by broken lines. Fig. 2 is an elevation of the sight-feed tube and its casing removed from the oil-cup. Fig. 3 is a vertical section of the oil-cup with the sight-tube and casing removed. Fig. 4 is a horizontal section through the oil-cup. Fig. 5 is a horizontal sectional plan of the nipple of the oil-cup in line 5 5, Fig. 1.

Like letters of reference refer to like parts in the several figures.

A represents a reservoir for the lubricant, preferably in the form of the ordinary oil-cup, consisting of a base *a*, cover *a'*, which is connected to the base by a central column a^2, having screw-threaded engagements with the base and cover, and a cylindrical body or shell a^3, of glass or other transparent material, which is clamped between the base and cover. The base of the oil-cup is provided with a screw-threaded nipple or coupling extension B for attaching the same to the cylinder to be lubricated or to a suitable pipe leading to the part to be lubricated. The nipple or coupling is hollow or provided with a discharge-passage connecting with the passage or pipe leading to the part to be lubricated.

The column a^2, connecting the base and cover sections of the oil-cup, is preferably hollow and constitutes a central pipe or passage, which communicates at its lower end with the oil-cup by one or more inlet-openings *c* in the base of the oil-cup and serves to convey the lubricant from the oil-cup to the sight-feed tube, which is arranged above the oil-cup.

D represents a feed tube or pipe through which the lubricant passes downwardly on its way to the engine-cylinder. The feed-tube preferably extends through the hollow column and is open at its upper and lower ends. It is screwed at its lower end into a threaded hole in the base of the oil-cup, and thus connects with the discharge-passage. The lower end of the feed-tube is controlled by a valve E, preferably a ball-valve, loosely confined in the discharge-passage between the lower end of the feed-tube and a plug *e*, which is screwed into the discharge-passage below the valve and is provided with a discharge-opening *e'* for the lubricant.

F represents an upright pipe or tube arranged in the oil-cup and extending upwardly above the highest level of the oil in the cup. This pipe is secured at its lower end to the base of the oil-cup and communicates by a passage *f* in the base of the oil-cup with the discharge-passage in the attaching-nipple. This pipe F and passage *f* are for the admission of the gas or air pressure from the engine-cylinder to the oil-cup above the oil therein. A check-valve *f'*, preferably a ball-valve, is confined loosely in a cage at the upper end of the pressure-pipe to seat on the top of the pipe. The cage for the valve is provided in its top with one or more holes for the escape of the gas or air pressure into the oil-cup.

G represents a sight-feed tube, of glass or other transparent material, arranged above and in line with the feed-tube D, so that the oil can drop or flow downwardly through the sight-tube into and through the feed-tube The sight-tube is mounted on the top of the oil-cup in any suitable manner. In the construction illustrated it is inclosed in a protecting shell or casing *g*, which is provided with one or more holes *g'* to expose the sight-tube and has a reduced cylindrical bottom portion *h*, which is secured in a corresponding opening *h'* in the cover of the oil-cup by the engagement of the threaded upper end of the feed-tube D in a central screw-threaded hole h^2 in the bottom of the shell. The shell has ears or projections h^3 for screwing it down on the oil-cup, and a packing-ring or

gasket h^4 is interposed between the top of the oil-cup and an annular shoulder on the shell to afford a tight joint between the parts. The construction described enables the sight-tube and shell to be removed, as shown in Fig. 2, and the oil-cup to be filled through the opening h'. A vent-hole h^5 in the top of the cup allows the escape of air from the cup when filling. This vent-hole is sealed by the packing-ring h^4 when the sight-tube is replaced.

If preferred, the sight-tube shell can be permanently secured by soldering or otherwise, in which case the cup is filled through a hole in its top, closed by removable screw-plug or cover h^6.

I represents a feed-nozzle for the lubricant arranged above and depending into the upper end of the sight-tube. This nozzle is preferably formed on or integral with a cap i for the shell of the sight-tube. The cap is provided with a reduced threaded lower portion which is screwed into a threaded opening in the upper end of the shell or casing for the sight-tube and bears against the upper end of the sight-tube to hold the latter in its casing or shell. The cap is provided with a chamber K, connecting with the feed-nozzle and communicating with the upper end of an ascending passage l for the oil leading from the upper end of the hollow column of the oil-cup. Preferably an annular channel l' is formed around the reduced portion of the cap between the same and the upper end of the shell or casing. This channel communicates with the chamber K by one or more holes l^2 in the cap and connects with the upper end of the ascending oil-passage l.

M represents a hand-operated feed-regulating valve, preferably having a screw-threaded stem working in a threaded hole in the cap for the sight-tube casing or shell, and having a lower conical end which coöperates with a conical seat at the top of the feed-nozzle to regulate the quantity of oil passing through the nozzle. The regulating-valve is provided at its upper end with a milled head or other suitable part for turning the same, and a clamp-nut n is screwed on the threaded stem of the valve and bears against the top of the cap of the sight-tube casing or shell to hold the valve in adjusted positions. n' is a packing for effecting an oil-tight joint between the stem of the valve and the cap.

The operation of the lubricator is as follows: When a pressure is created in the cylinder by the explosion or compression of the gas or air, the pressure lifts the ball-valve E beneath the feed-tube up against the lower end of the feed-tube to prevent the entrance of gas into the latter, passes through the pressure-passage f and pipe F, lifting the check-valve at the upper end of the latter, and escapes through the opening or openings in the valve-cage into the oil-cup above the oil or lubricant therein. The pressure thus exerted on the surface of the oil in the oil-cup forces the oil through the inlet-openings c in the base of the cup into and up through the hollow column and ascending oil-passage l into the chamber of the regulating-valve. When the pressure is relieved or a suction created in the engine-cylinder, the valve beneath the feed-tube is moved downwardly from the lower end of the feed-tube and the oil is drawn therefrom through the feed-nozzle and the sight and feed tubes, past the valve E and through the discharge-passage into the cylinder of the engine. The upper end of the plug e beneath the valve E is provided with grooves to permit the oil to pass the valve.

The lubricator described is positive and reliable in action. The quantity of oil fed can be controlled to a nicety by adjusting the regulating-valve, and when adjusted the feed will be constant, regardless of the diminishing quantity of oil in the cup, and the attendant can observe whether or not the oil is properly feeding.

I claim as my invention—

1. The combination of a reservoir, a passage for supplying gas-pressure to the reservoir, a sight-tube arranged above the reservoir, an ascending passage for conveying the oil to a point above the sight-tube, a feed-tube for the oil extending from the lower end of said sight-tube down through the reservoir, and an automatic valve controlling said feed-tube, substantially as set forth.

2. The combination of a reservoir, a passage for supplying gas-pressure to the reservoir, a sight-tube arranged above the reservoir, an ascending passage for conveying the oil to a point above the sight-tube, a feed-tube for the oil extending from the lower end of said sight-tube down through the reservoir, an automatic valve controlling said feed-tube, and a regulating-valve for controlling the feed of the oil, substantially as set forth.

3. The combination of a reservoir, a passage for supplying gas-pressure to the reservoir above the oil therein, a sight-tube arranged above the reservoir, a feed-nozzle directed into the upper end of said sight-tube, a regulating-valve controlling said nozzle, an ascending passage for conveying the oil to said feed-nozzle, a feed-tube arranged in line with said sight-tube and extending down through said reservoir, and an automatic valve controlling the lower end of said feed-tube, substantially as set forth.

4. The combination of a reservoir provided at its bottom with a nipple having a discharge-passage for the oil, a passage leading from said discharge-passage for supplying gas-pressure in the reservoir, a hollow column in said reservoir connecting with the latter at its lower end, a sight-tube mounted

on said reservoir, a valve-controlled feed-nozzle at the upper end of said sight-tube, an ascending oil-passage leading from said hollow column to said feed-nozzle, a feed-tube connecting the lower end of said sight-tube with said discharge-passage and passing through said hollow column, and an automatic valve controlling said feed-tube, substantially as set forth.

5. The combination of an oil-cup, a passage for supplying gas-pressure to the same, a sight-tube removably mounted on top of said oil-cup, an ascending oil-passage leading from the oil-cup to a point above said sight-tube, a feed-tube leading from the lower end of said sight-tube down through the oil-cup, an automatic valve controlling said feed-tube, said sight-tube when removed uncovering said ascending oil-passage, and an air-vent hole in the oil-cup to permit filling of the latter, substantially as set forth.

6. The combination of a reservoir, a passage for supplying pressure to the reservoir, a check-valve for said passage, a sight-tube arranged above the reservoir, an ascending passage for conveying the oil to a point above the sight-tube, a feed-tube for the oil extending from the lower end of said sight-tube down through the reservoir, and an automatic valve controlling said feed-tube, substantially as set forth.

Witness my hand this 1st day of June, 1905.

FRANK C. LE MESSURIER.

Witnesses:
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