

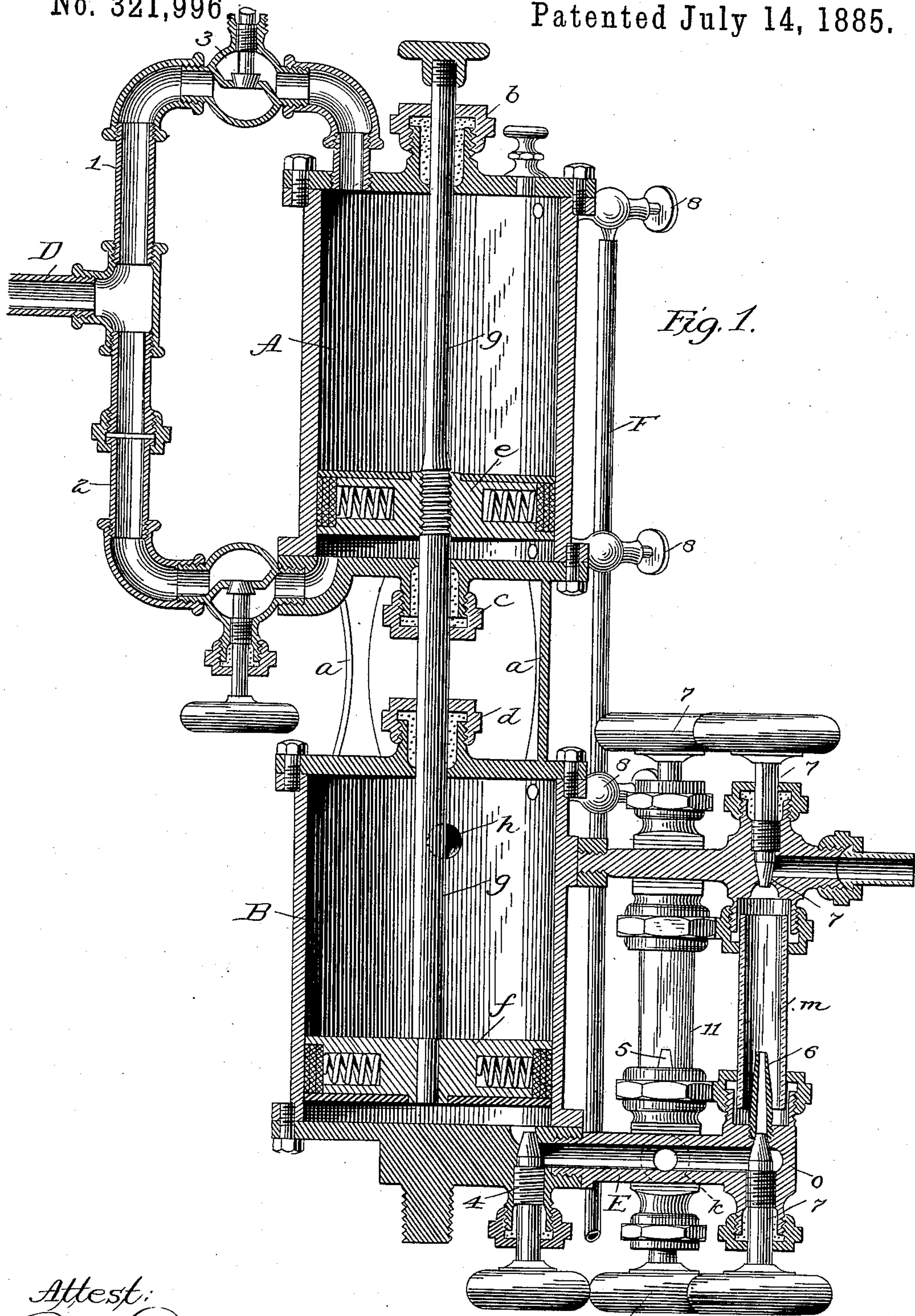
(No Model.)

J. C. MULBERRY.
LUBRICATOR.

2 Sheets—Sheet 1.

No. 321,996

Patented July 14, 1885.



Attest:
Halter Donaldson
F. L. Middleton

Inventor
James C. Mulberry
by Joyce & Spear
Attys.

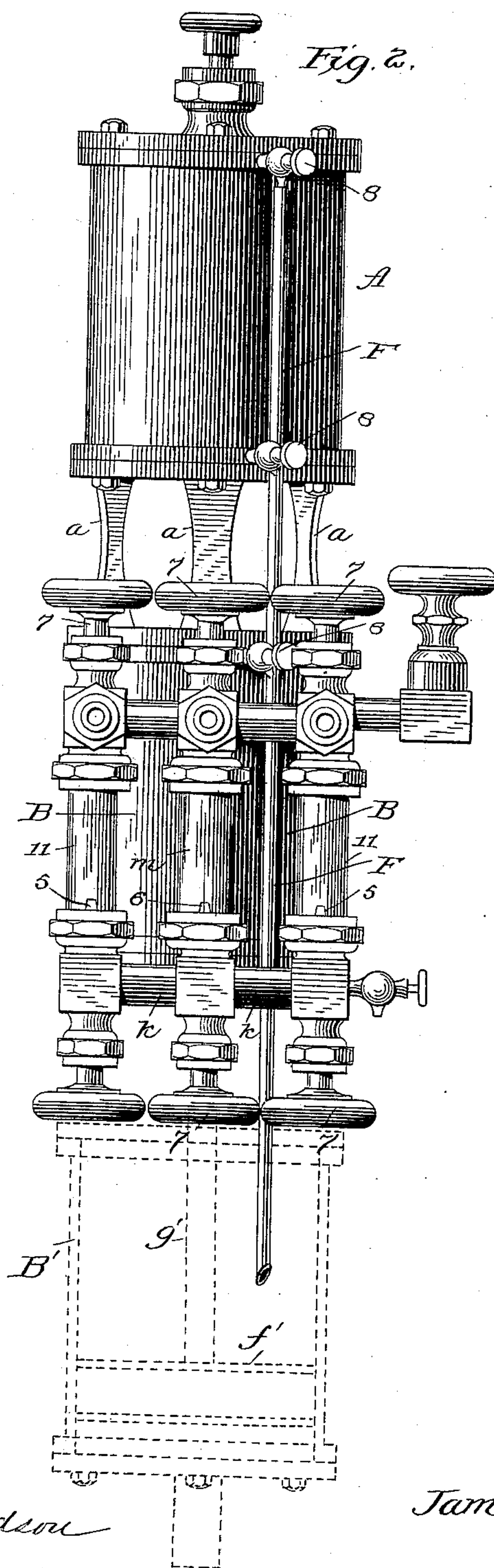
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2 Sheets—Sheet 2.

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LUBRICATOR.

No. 321,996.

Patented July 14, 1885.



Attest
Walter M. Alderson
F. L. Middleton

Inventor
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UNITED STATES PATENT OFFICE.

JAMES COSTON MULBERRY, OF CINCINNATI, OHIO, ASSIGNOR OF TWO-THIRDS TO FRANK A. BACHELOR AND HARRY E. LANGDON, OF SAME PLACE.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 321,996, dated July 14, 1885.

Application filed May 23, 1885. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. MULBERRY, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Lubricators; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to lubricators for steam-engines. It is designed more especially for locomotive-engines, but is in the main features also applicable to stationary engines.

One object of the invention is to feed the crude oil or oil unmixed with water or steam and without being heated, whereby a great saving of oil is effected and the parts are kept better lubricated.

Another object is to enable the operator to easily and accurately regulate the supply of oil to the cylinders of a locomotive-engine when steam is off or on.

A third object includes convenient arrangement for supply of oil from the same cup to two or more cylinders or engines.

I have shown means for feeding from the same apparatus two different kinds of oil, and with these objects I have also sought to attain others by improved details, all as hereinafter set forth.

In the accompanying drawings is shown the form in which I have embodied my invention. In these drawings, Figure 1 represents a central vertical section. Fig. 2 represents a front view.

Heretofore oil-cups have been devised with a piston adapted to move in the cup by pressure of steam behind it, and thereby to force the lubricant in front of the piston through the orifice leading to the parts to be lubricated. In these it is difficult to pack the piston so closely as to effectually prevent the passage of the steam and water of condensation to the oil-chamber or the oil from forcing its way back to the steam-chamber; and, further, by the proximity of the steam the oil is more or less heated. This heat and mixture with water tends to diffuse the oil in a vaporous condition throughout the body of steam,

so that much of it passes off in the exhaust without coming in contact with the parts to be lubricated. Further, in the displacement-feed lubricators, in addition to the heating of the oil and its mixture with the steam in diffused state, the feed of oil is due wholly to the condensation of steam, whereby the oil is displaced. This limits and impairs the force and regulation of the supply or feed of the oil, and heretofore only one, or at most two, feed-pipes for the oil have been led from a single cup.

In the machine shown in the drawings, A represents a steam-cylinder, and B the oil-cylinder, corresponding to the ordinary oil-cup. These are placed with their central axes in the same line, and are connected to one another by brackets *a*, secured to the opposing heads. The upper end of the oil-cylinder and both ends of the steam-cylinder are provided with central stuffing-boxes, *b c d*. Within the steam-cylinder is a properly-packed piston, *e*, and a similar piston, *f*, is in the oil-chamber. Both these pistons are connected to one piston-rod, *g*, which extends through the upper head of the steam-cylinder. Steam from any suitable source is led to the steam-piston above and below by means of a steam-supply pipe, D, with branches 1 and 2, branch 1 leading through the upper head and branch 2 leading through the lower. The pistons are so arranged on the rods that both arrive at the bottom of the cylinders at the same time. The oil-cylinder is supplied with oil through a hole, *h*, when the piston is drawn up, as it may be by admission of steam through the branch pipe 2. The steam is then shut off from the branch-pipe 2 and opened in the branch pipe 1, which supplies the steam in the steam-cylinder above the piston *e*, and thereby puts any required amount of pressure upon the oil in the oil-cylinder, feeding it through the supply-pipes to the parts to be lubricated. The pressure of the steam is constant, and may be regulated by means of a stop-cock, 3, in the branch pipe 1, and when regulated it is con-

stant throughout the whole movement of the piston. The oil is delivered from the bottom of the oil-cylinder through the pipe E, which is closed by means of a stop-cock, 4. This pipe E has branches *k k*, on each of which is placed a delivery-nozzle, 5, about which is a sight-feed tube, 11. The sight-feed tube is connected to the pipe above and below by ordinary packing and jam-nuts. These sight-feed tubes 11 11 are designed for the cylinders of locomotive-engines in the form of the cup shown in the drawings. Another sight-feed tube, *m*, is connected with an extension with its nozzle 6, similar to the nozzle 5, all of these nozzles being adapted to deliver the oil of the pipe E, (marked *o*,) which is provided oil in jets or drops. The pipe *m* is connected to a supply-pipe which communicates with the air-brake engine of the locomotive, so that both the cylinders and the air-brake engine are oiled from the same cup. The sight-feed-tube connections are provided above and below with stop-cocks 7. These serve to regulate the flow of oil or to close the passages whenever it may be necessary in working the apparatus. The upper stop-cocks serve to shut off the steam and prevent any return of the oil to flow down upon the glass when the apparatus is not working.

It will be observed that the pipes connected directly to the sight-feeds are all in connection with one pipe, E, leading to the cup, so that a single valve shuts off all the oil from the whole, while each nozzle is provided with an independent stop-cock for independent regulation of the amount of oil supplied through each pipe.

It will also be observed that the supply of oil through the sight-feed tubes is upward. I propose, for the best effect, to fill these sight-feed tubes with a mixture of alcohol and water of specific gravity greater than that of the oil used in the lubricator, this serving the purpose of preventing freezing at ordinary low temperatures, and the consequent breaking of the glass when steam is suddenly turned on. In connection with the special form of force-feed herein shown I am able to use three or more oil-supply pipes in connection with the steam-cylinder, the force from the steam being sufficient for any ordinary number of oil-supply pipes. As before indicated, the apparatus shown in the drawings is designed for a locomotive-engine; but substantially the same form may be used for other purposes or in other connections, and the oil-supply pipes leading through the oil-cup may be led to the various parts to be lubricated.

The structure shown, in respect to the oil-cup and the means for forcing the oil, affords another advantage by which the steam-force feed may be applied to two cups or more than two cups, each cup containing a different kind of oil for lubricating bearings of the machinery driven by the engine, and the like. In order to provide for this I attach a third oil-

cylinder, B', to the cylinder B by the same means used to connect the cylinders A B, and the piston-rod *g* is extended through in the same manner, as explained above, between the cylinders A B. Cylinder B' is filled with a kind of oil, for example, used to lubricate the journals and bearings of machinery, and has a discharge-pipe similar to cylinder B, which delivers the oil to the various branch pipes required for the purpose. The piston *f'*, properly packed in the cylinder B', applies the pressure to the oil within the three cylinders, and force is applied to both through the piston in the steam-cylinder.

Means for conducting the oil from the three cylinders to the various bearings and journals may be of any ordinary construction.

A pipe, F, connected to the steam-cylinder above and below and to the oil-cylinder, and provided with branches having stop-cocks 8, serve to convey away any water of condensation from the steam-cylinder and also to give vent to the oil-cylinder.

I claim as my invention—

1. A lubricator having an independent cylinder for the oil and a piston therein, a separate steam-cylinder having steam-connections at both ends, also provided with a piston, the latter piston being connected to and adapted to operate the piston of the oil-cylinder, steam-pipe connections with the steam-cylinder only, a vent to the outside from the oil-cylinder, and oil-pipe connections with the oil-cylinder, all substantially as described.

2. A lubricator having an independent oil-cylinder provided with a piston, a separate cylinder for the steam having a piston connected with the piston of the oil-cylinder, and means outside of said oil-cylinder for applying pressure to the piston thereof, in combination with three or more oil-delivering nozzles and sight-feed tubes and regulating-valves for each tube, all arranged to operate substantially as described.

3. A lubricator having an independent oil-cylinder provided with a piston, a separate cylinder for the steam having a piston connected with the piston of the oil-cylinder, in combination with an oil-delivery pipe, E, having a transverse pipe forming branches diverging therefrom laterally, and supporting sight-feed tubes and their regulating-valves, substantially as described.

4. A lubricator having an independent oil-cylinder provided with a piston, a separate cylinder for the steam having a piston connected with the piston of the oil-cylinder, in combination with an oil-delivery pipe, E, having a transverse pipe forming branches diverging therefrom laterally, sight-feed tubes with regulating-valves supported thereon, and a forward extension supporting a sight-feed tube in advance of those on the lateral branches, and an independent regulating-valve for the said tube, substantially as described.

5. An oil-cylinder provided with a piston,

f, and piston-rod *g*, and devices, substantially as described, for applying to the said piston a constant pressure, pipes leading from the oil-cylinder to nozzles 5 and 6, regulating-
5 valves for each of said nozzles, sight-feed tubes, and pipes leading from said tubes to the parts to be lubricated, all as set forth.

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

JAMES COSTON MULBERRY.

Witnesses:

F. L. MIDDLETON,

WALTER DONALDSON.