

(No Model.)

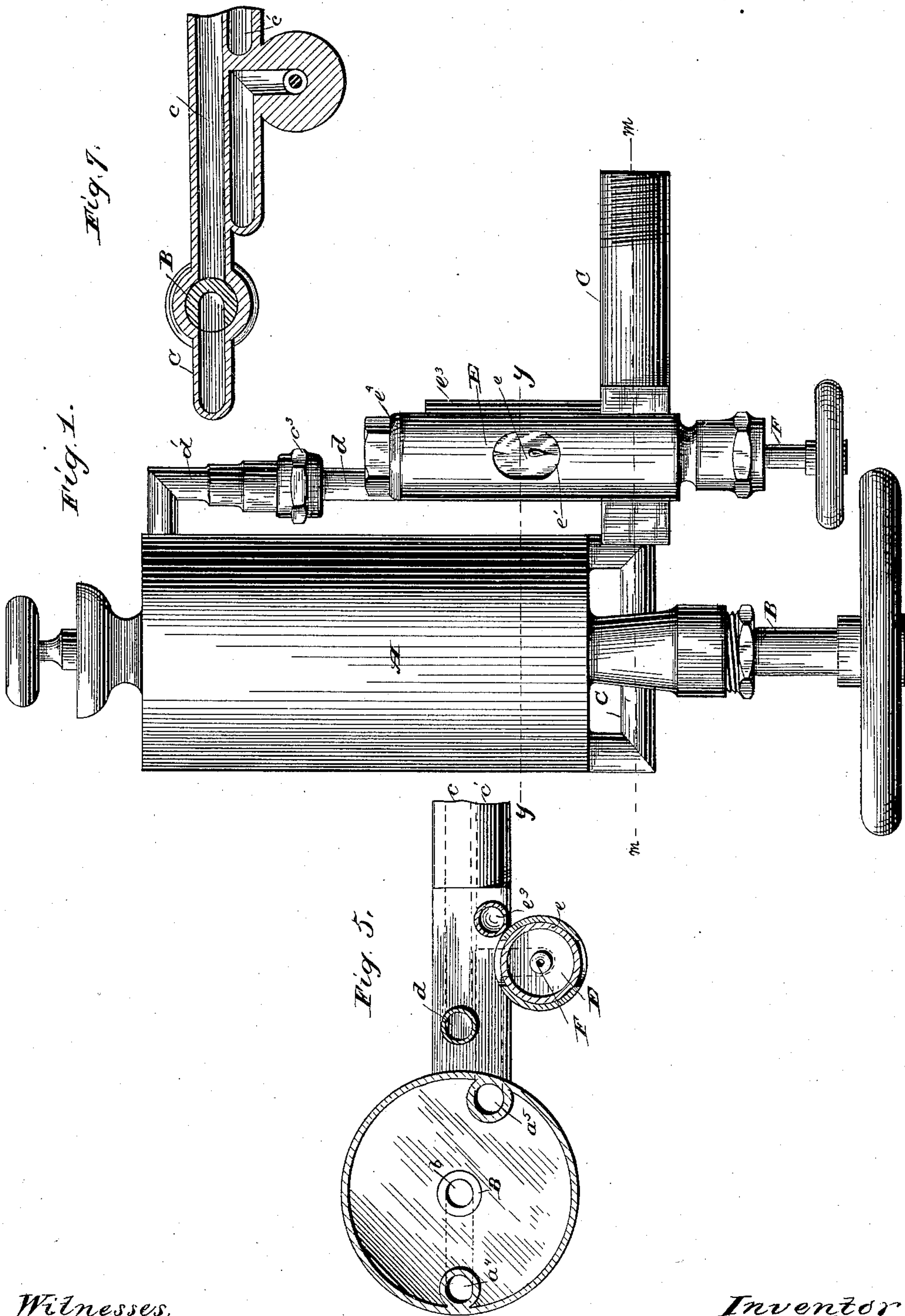
2 Sheets—Sheet 1.

A. T. BALLANTINE.

LUBRICATOR.

No. 371,916.

Patented Oct. 25, 1887.



Witnesses.
Jm M. Monroe.
M. L. Combs

Inventor
Alexander T. Ballantine
by H. T. Fisher.
Attorney.

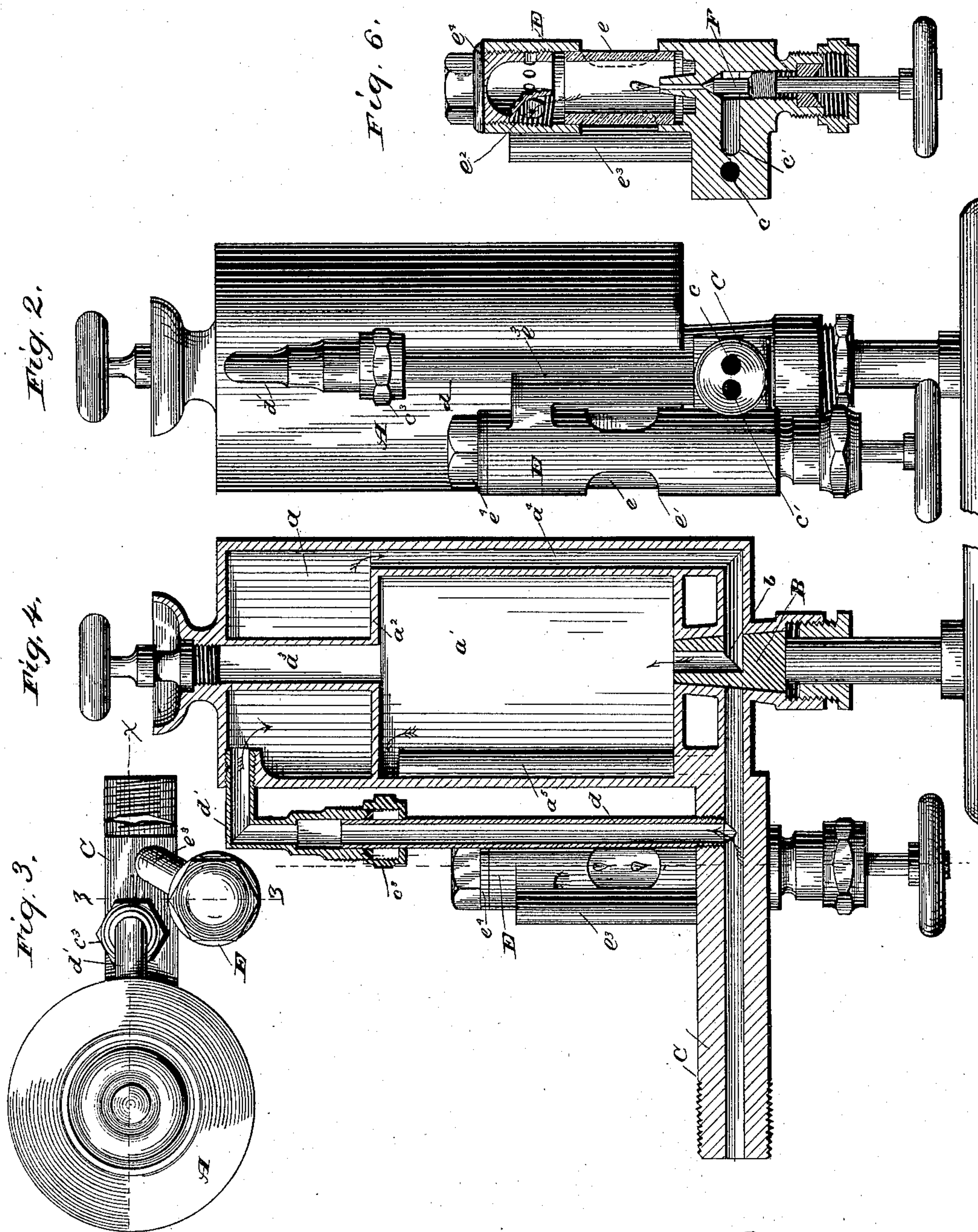
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UNITED STATES PATENT OFFICE.

ALEXANDER T. BALLANTINE, OF CLEVELAND, OHIO.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 371,916, dated October 25, 1887.

Application filed September 27, 1886. Serial No. 214,627. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER T. BALLANTINE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Lubricators for Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to improvements in lubricators for steam-engines; and it consists in the construction and arrangement of parts, as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of the lubricator complete. Fig. 2 is an elevation thereof, looking from the right of Fig. 1. Fig. 3 is a plan view. Fig. 4 is a vertical section on line $x x$, Fig. 3, with the position reversed. Fig. 5 is a horizontal section on line $y y$, Fig. 1. Fig. 6 is a transverse section on line $z z$, Fig. 3. Fig. 7 is a horizontal section on line $m m$, Fig. 1.

Similar letters of reference indicate corresponding parts.

A is a cylinder, containing condensing-chamber a and oil-chamber a' beneath it. A diaphragm, a^2 , separates the two chambers, and a neck, a^3 , passes through the condensing-chamber and, connecting the head of the cylinder and the diaphragm, serves to introduce oil to the oil-chamber. The neck is provided with a saucer and screw-plug.

a^4 is a channel on the side of the cylinder, through which and the turning plug B in the bottom of the cylinder the fluid accumulating in the condensing-chamber is conducted into the oil-chamber.

a^5 is a steam and oil conduit on the opposite side of the cylinder from a^4 , for directing the oil to the steam-pipe, as hereinafter described.

The turning plug B has a right-angled passage-way, b , adapted to register with the passage a^4 or the steam-passage c , according to its position, as will be seen further on.

C is a short arm or pipe, preferably cast integral with the base of the cylinder A, and having a steam-passage, c , which communi-

cates with pipe d , and steam and oil passage or conduit c' , which communicates with the pipe outside the water-tube E. The pipe d is screwed into the pipe C at the inner end of the conduit c therein, and its opposite end rests in a socket in the elbow-pipe d' , which discharges into the condensing-chamber. A packing-nut, c^3 , secures the joint between pipes $d d'$.

E is the water-tube, provided with glass cylinder e and oblong opening e' , to view the feed. Near the top of the tube is an overflow-orifice, e^2 , and outside thereof a short pipe, e^3 , connecting the said orifice and the steam and oil channel c' in the pipe C. A screw-plug, c^4 , having perforations adapted to register with the orifice e^2 , closes the top of the water-tube. In the bottom of the water-tube I place a needle-valve, F, which is screw-threaded and packed and serves for governing the flow of oil through the water-tube to the steam-cylinder.

The operation is as follows: Steam under equal pressure being admitted to the lubricator through the channels $c c'$, which head back to the engine, condensation occurs in both the chamber a in cylinder A and in the water-tube E sufficient for all practical purposes. The chamber a' having been filled, say, half-full of oil, and the plug B turned, as shown in Fig. 4, the accumulating fluid in chamber a descends through passage a^4 , and by its superior weight lifts the oil to the point of overflow into passage a^5 . Condensation having meantime occurred in the tube E, said tube is supposed to be filled with water, and the oil by its greater volume and pressure in the pipe or passage a^5 and the connecting-channel beneath forces its way subject to control or measurement by the needle-valve F to the water-chamber E, and thence by its buoyancy to the surface and into the overflow-pipe e^3 , where it is caught up by the steam and carried to the steam-chest to perform the office for which it is intended. Normally the water-tube E is full to overflowing by condensation. The two-way plug B is adapted to be turned directly into communication with the conduit C, in which case it cuts off the flow of water through the channel a^4 and enables the water in the oil-chamber to be drawn off when for

any reason this becomes desirable or necessary. In this manner I can drain the oil-chamber and discharge the water therein through the steam-conduit *c* and steam-chest, and wholly avoid the inconvenience and annoyance of drawing it off in a vessel outside, as is required in other structures of this class. This also enables me to utilize the oil that may remain in the chamber when replenishing is necessary, or is held in the water in solution, which adds an element of economy to convenience.

Of course two separate plugs or cocks, instead of the two-way plug B, may be employed to control the fluid-passages in the bottom of the cylinder, and the channels *a*⁴ *a*⁵ placed on the outside of the cylinder, if desired. Again, separate pipes, instead of the pipe C with two channels, may be used, in which case the method of coupling pipes *d* *d'* could be omitted, and the water and oil chambers may be formed separately. These, however, are changes in minor and unessential features, and, like others that might be suggested, do not affect the merits of the invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a lubricator, an oil-chamber, a condensing-chamber above the oil-chamber, and a conduit leading from the condensing-chamber to the bottom of the oil-chamber and having a reversing shut-off plug at the point of its entrance into the said oil-chamber, in combination with inlet and outlet pipes connected with the bottom of said chambers, substantially as set forth.

2. In a lubricator of the character described, a conduit connecting the bottoms of the condensing-chamber and the oil-chamber, a fluid-

passage opening into the bottom of the oil-chamber and extending thence into the steam-pipe, and a device controlling the flow of fluid through both the aforesaid conduit and fluid-passage and closing one while it opens the other, all in combination, substantially as described.

3. In a lubricator, the combination of a condensing-chamber, an oil-chamber, and a conduit between them leading into the bottom of the oil-chamber, a fluid-passage opening into said conduit at its entrance to the oil-chamber and emptying into the steam-pipe, and a reversible plug controlling said conduit and fluid-passage, substantially as set forth.

4. In a lubricator, a cylinder having oil and water chambers connected by a conduit which enters the oil-chamber at the bottom, and a plug in said bottom controlling said conduit and the outlet from the oil-chamber, in combination with an outside tube entering the water-chamber, and an overflow-passage connected with the top of the oil-chamber, substantially as set forth.

5. In a lubricator, a cylinder provided with oil and water chambers separated by a diaphragm, a conduit between said parts entering the oil-chamber at the bottom, a fluid-passage leading from the oil-chamber into the steam-pipe, and a plug controlling the conduit and the fluid-passage, in combination with an overflow-passage in the oil-chamber, a sight-feed connected with the said passage, and an overflow-tube connected with the sight-feed, substantially as set forth.

ALEXANDER T. BALLANTINE.

Witnesses:

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