J. HARPER.

LUBRICATOR FOR STEAM-ENGINES.

No. 191,425. Patented May 29, 1877.

Fig. 1

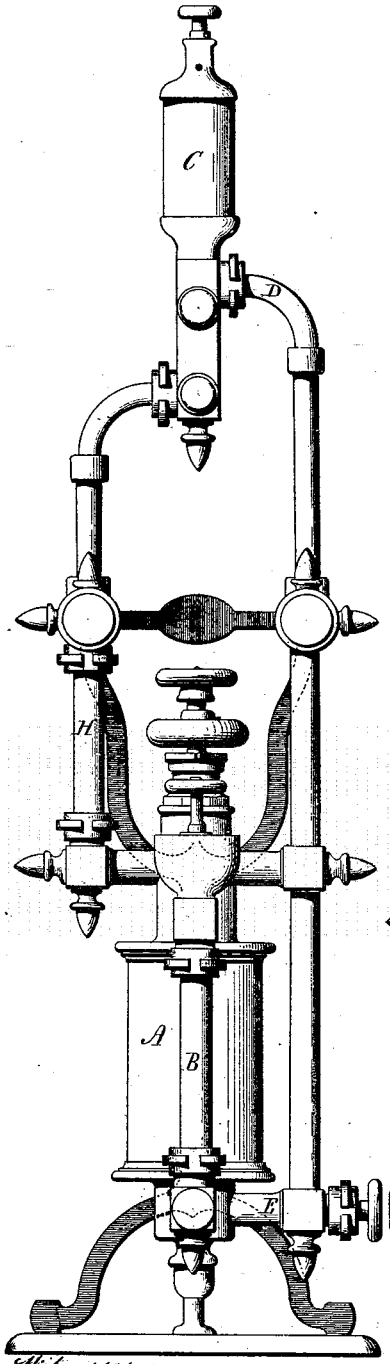


Fig. 2

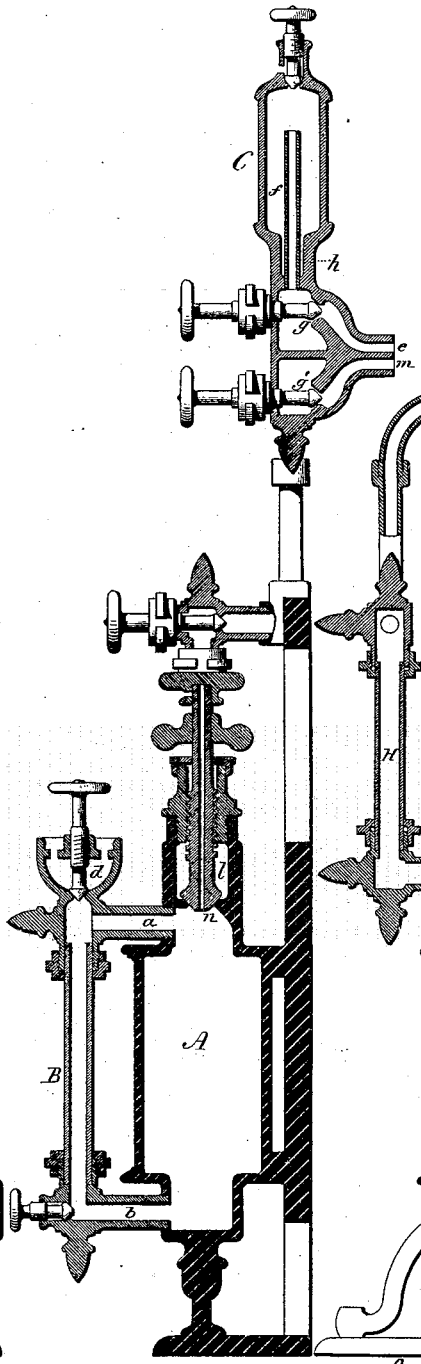
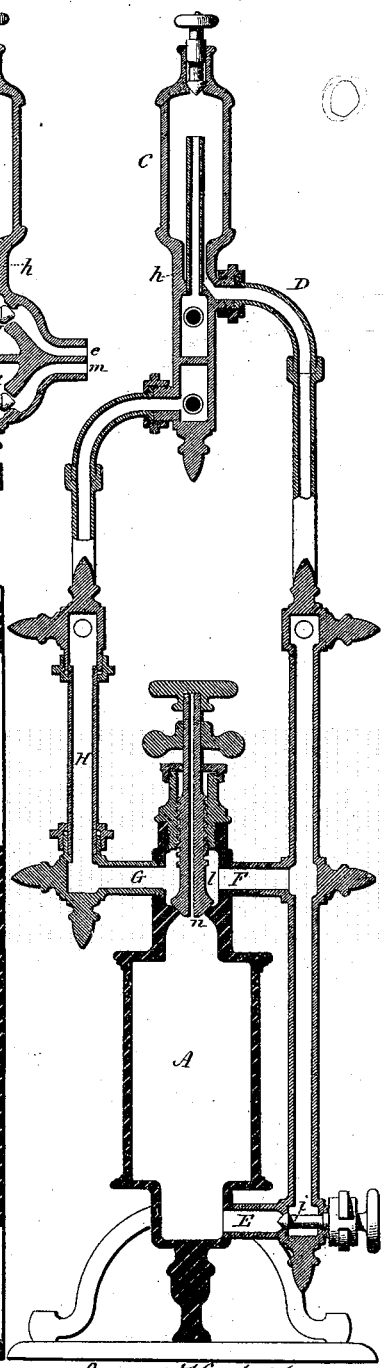


Fig. 3



Witnesses.
J. N. Shumway
Clara Broughton.

James E. Harper Inventor
By Atty.
Wm E. Earle

UNITED STATES PATENT OFFICE.

JAMES HARPER, OF WESTVILLE, CONNECTICUT.

IMPROVEMENT IN LUBRICATORS FOR STEAM-ENGINES.

Specification forming part of Letters Patent No. **191,425**, dated May 29, 1877; application filed March 17, 1877.

To all whom it may concern:

Be it known that I, JAMES HARPER, of Westville, in the county of New Haven and State of Connecticut, have invented a new Improvement in Lubricator for Steam-Engines; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a side view; Fig. 2, a vertical central section on line *x x;* and in Fig. 3, a transverse vertical central section.

This invention relates to an improvement in that class of lubricators designed for steam-engines, and in which the condensation from steam serves as the medium for conveying the oil to the steam-pipe.

In the hitherto constructions of this class of lubricators a pressure has been required to elevate the oil, in some cases by the pressure of the steam, and in others by the hydrostatic column.

The object of this invention is to convey the oil by simply floating it in equilibrium—that is to say, without pressure; and it consists in the device as hereinafter described, and more particularly recited in the claim.

A represents the oil-reservoir, which may be of glass or any suitable material. From this reservoir the passage *a* at the top and *b* at the bottom communicate with the vertical gage-tube B closed above by a valve, *d*, and through which the oil may be poured to fill the reservoir, and in substantially the usual manner for this class of lubricators. At some distance above the reservoir A the condenser C is arranged. From the steam-pipe a passage, *e*, leads into the condenser through a vertical tube, *f*, the top of said tube being some distance above the bottom of the condenser, and the passage *e* is opened or regulated by means of the valve *g*. The condensation of the steam in the condenser settles to the bottom around the tube *f* in a recess, *h*, prepared for the purpose. From this recess *h* a tube, D, leads directly downward, and turns through a passage, E, into the lower portion of the reservoir A, so that the water arising from condensation will flow through the tube D down into the reservoir A. This lower passage E, for purposes hereinafter explained, is provided with an adjustable valve, *i*, and from this vertical tube D there is another transverse passage, F, which leads into a valve-chamber, *l*, above the reservoir, the communication between this chamber and the reservoir closed or regulated by a valve, *n*, and from this same chamber *l* there is a second passage, G, which leads to a second vertical tube, H, through a passage, *m*, into the steam-pipe. This passage is closed or regulated by a valve, *g'*, thus making a communication from the steam-pipe through the condenser, the pipe D, into the reservoir, thence through the passage G, tube H, and passage *m*, again to the steam-pipe, so that the tubes and passages being open, a perfect equilibrium is produced. It will be understood that the steam-pipe referred to as communicating with the passages *e m* is that pipe leading the steam to the engine.

The operation of the apparatus is as follows: Suppose the reservoir to have been filled with oil, the valve *n* at the top of the reservoir opened so as to permit just the quantity of oil required for lubrication to pass the valve *i*, and the valves *g* and *g'*, in the passages *e m*, all being opened, steam will pass into the condenser, the condensation will flow therefrom down into the reservoir, causing the oil to rise correspondingly up through the passages G H, and thence to the steam-pipe through the passage *m*, where it will be carried with the steam to the steam-chest.

If the condensation be greater, as it will be, than the amount of oil required, then the surplus condensation will pass from the vertical pipe D, through the transverse passage F, and chamber *l*, passage G, vertical tube H, thence through the passage *m*, returning to the steam-pipe, carrying with it the oil which has passed through the opening *n*, thus keeping up a constant circulation, not only through the reservoir, so as to raise the oil, but to carry the oil faster than the natural rise through the valve *n*, and if at any time it be desirable to cut off the flow of oil, it is only necessary to close

the valve *n;* then the circulation will continue above through the passages F G, and independent of the reservoir.

The flow at the various points may be regulated by the valves, or entirely cut off.

Because of the constant or free flow of the condensation, no hydrostatic pressure can be produced upon the oil. It has the pressure of the steam both above and below; hence the lubricant is removed from the reservoir only by its floating properties.

The entrance and exit passages *e m* need not be at substantially the same point, as shown, but may be some distance from each other, provided always that there be the passage F G above the reservoir, at substantially the point where the oil passes from the reservoir.

I claim—

In combination with a lubricator, substantially such as described, a condenser and double connection or passages from the steam-pipe, one passage leading from the steam-pipe to the condenser, thence to the reservoir, the other from the reservoir to the steam-pipe, and a connection or passage between the passage to and from the reservoir, and at a point substantially level with the discharge from the reservoir, substantially as described.

JAMES HARPER.

Witnesses:
JOHN E. EARLE,
CLARA BROUGHTON.