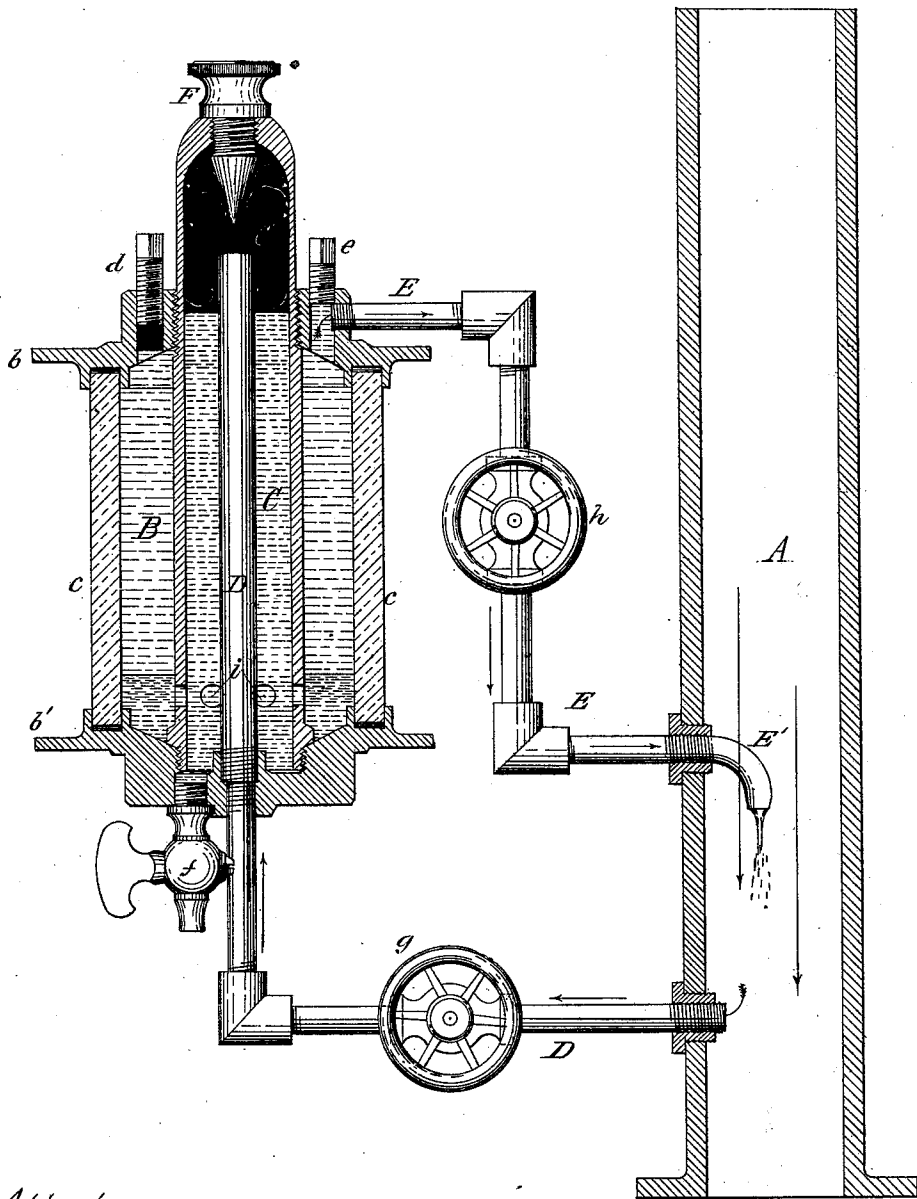


J. L. KNIGHT.
Lubricator.

No. 204,672.

Patented June 11, 1878.



Attest:

Edward H. Wales
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UNITED STATES PATENT OFFICE.

JOHN L. KNIGHT, OF NEW YORK, N. Y.

IMPROVEMENT IN LUBRICATORS.

Specification forming part of Letters Patent No. **204,672**, dated June 11, 1878; application filed April 2, 1878.

To all whom it may concern:

Be it known that I, JOHN L. KNIGHT, of New York city, in the State of New York, have invented certain new and useful Improvements in Lubricators or Oil-Cups, of which the following is a specification:

My invention relates to that class of oil-cups which connect with the steam-pipe of the engine and deliver the oil therein, to become diffused through the steam in its passage to the engine, and to that class which effect the feed of the oil by the siphoning action of a descending oil-column and by the suction produced by the rush of steam to the engine; and my invention consists in the special construction and arrangement of the internal steam-condensing and water chamber relatively to the outer oil-vessel, as hereinafter set forth.

The drawing annexed represents a vertical central section of my improved oil-cup, the connecting-pipes thereof appearing in elevation.

A represents the steam-pipe leading from the boiler to the engine, and in which the steam is supposed to be passing in the direction of the arrow. B represents the oil-cup, attached on the steam-pipe, as shown, at any convenient point.

For convenience, the oil-cup is formed of two heads, *b b'*, between which is clamped a cylinder, *c*, of glass or other suitable material; but, for practical reasons, I prefer to make this cylinder of metal and attach an ordinary glass gage to the exterior of the same, to show the height and the rate of outflow of the contents.

d e are screw-plugs in the top of the oil-reservoir, through which oil or water may be inserted; and *f* is a pet-cock in the bottom thereof, through which the accumulated excess of water may be removed. C C' is a steam-condensing and water cylinder, which communicates at the bottom with the oil-cylinder B *c*, and to the top of which the steam-vent is admitted from the steam-pipe A through the connecting or steam-vent pipe D, provided with a regulating-valve, *g*. This cylinder C is arranged centrally within the oil-cylinder, as shown, being perforated with holes *i* at its lower end, which open into the bottom of the oil-cylinder, as represented. The upper ex-

tremitly of the chamber forms a condensing-dome, C', and extends above and free of the oil-cylinder, to be more exposed to the cooling effects of the external air.

The central cylinder C is preferably screw-threaded at its top and bottom to screw into the heads *b b'*, and thus form a simple means of securing the parts of the oil-cup together.

The steam-vent pipe D may enter directly in the top of the dome C'; but it is preferably arranged, as shown, to enter at the bottom of the oil-cup, and rise centrally through the liquid therein, opening at the top in the dome C'. By this arrangement, the pipe being in contact with the liquid of the cup, a more cooling effect is produced on the entering steam. In the top of the dome C' is fitted a conical valve or plug, F, directly over the opening of the steam-vent pipe D. This deflects or sprays the entering steam outward against the sides of the dome, and thus increases the condensing effect. The plug F may also be used as a valve to close the steam-inlet in lieu of the valve *g*, if desired.

E is the oil feed pipe, which connects with the top of the oil-reservoir, extends downward therefrom in the form of a siphon, and its lower extremity enters the steam-pipe A, and terminates therein in the form of an ejector or suction-nozzle, E', turned in the direction of the passing steam.

The oil-cup being thus connected with the steam-pipe, the action is as follows: To first start the oil-cup into action, the valves *g h* are closed and the screw-plug *d* or *e* is opened, and water is first poured into the oil-cup sufficient to about equal the capacity of the water-cylinder C. The oil-cylinder B is then charged to its full extent with the oil, and as the oil enters the same the water, on which it rests, is gradually forced into the water-cylinder C, in which it rises to a balancing level. When the oil-cylinder is thus filled to the utmost, the screw-plugs are closed and the valves *g h* are opened, the steam-valve *g* being opened first. The steam thus entering the dome C' above the oil and water, a vent is thus established which equalizes the pressure on the oil-cup and prevents the steam entering the oil-pipe E, upon which a suction effect is at once produced by the rush of the steam past the

nozzle end *E'* of the oil-pipe. This suction, in connection with the displacing effect of the condensing steam in the chamber *C C'*, establishes a descending column of oil in the oil-feed pipe *E*, forming a siphon of the same, through which the oil is thus induced to pass into the steam-pipe *A* in a positive and steady flow, which may be regulated, as required, by the adjustment of the valves *g h*. As the oil flows outward the water-level rises in the oil-chamber *B*, and thus indicates to the observer the rate of feed, which may be regulated as occasion requires.

If desired to render the outflow more visible, a small glass or bull's-eye may be inserted in the steam-pipe *A* at the location of the nozzle *E'*, to render the drip of the oil from the nozzle visible.

When the oil in the cup is exhausted it may be refilled by first shutting off the valves *g h* and draining the accumulated excess of the water of condensation through the pet-cock *f*,

sufficient water being, however, always allowed to remain in the oil-cup to about equal the capacity of the water-cylinder *C*.

What I claim as my invention is—

1. In an oil-cup, the internal condensing and water chamber *C C'*, arranged to rise through the oil-vessel, with its condensing end *C'* extended out of and above the oil-vessel, in combination with the outer oil-vessel *B*, oil-feed pipe *E*, and steam-vent pipe *D*, arranged and operating substantially as herein shown and described.

2. An oil-cup formed of a central cylinder, *C C'*, having its sides threaded at the top and bottom, in combination with an outer cylinder, *B b b'*, having its heads *b b'* screwed onto the same, substantially as herein shown and described.

JOHN L. KNIGHT.

Witnesses:

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