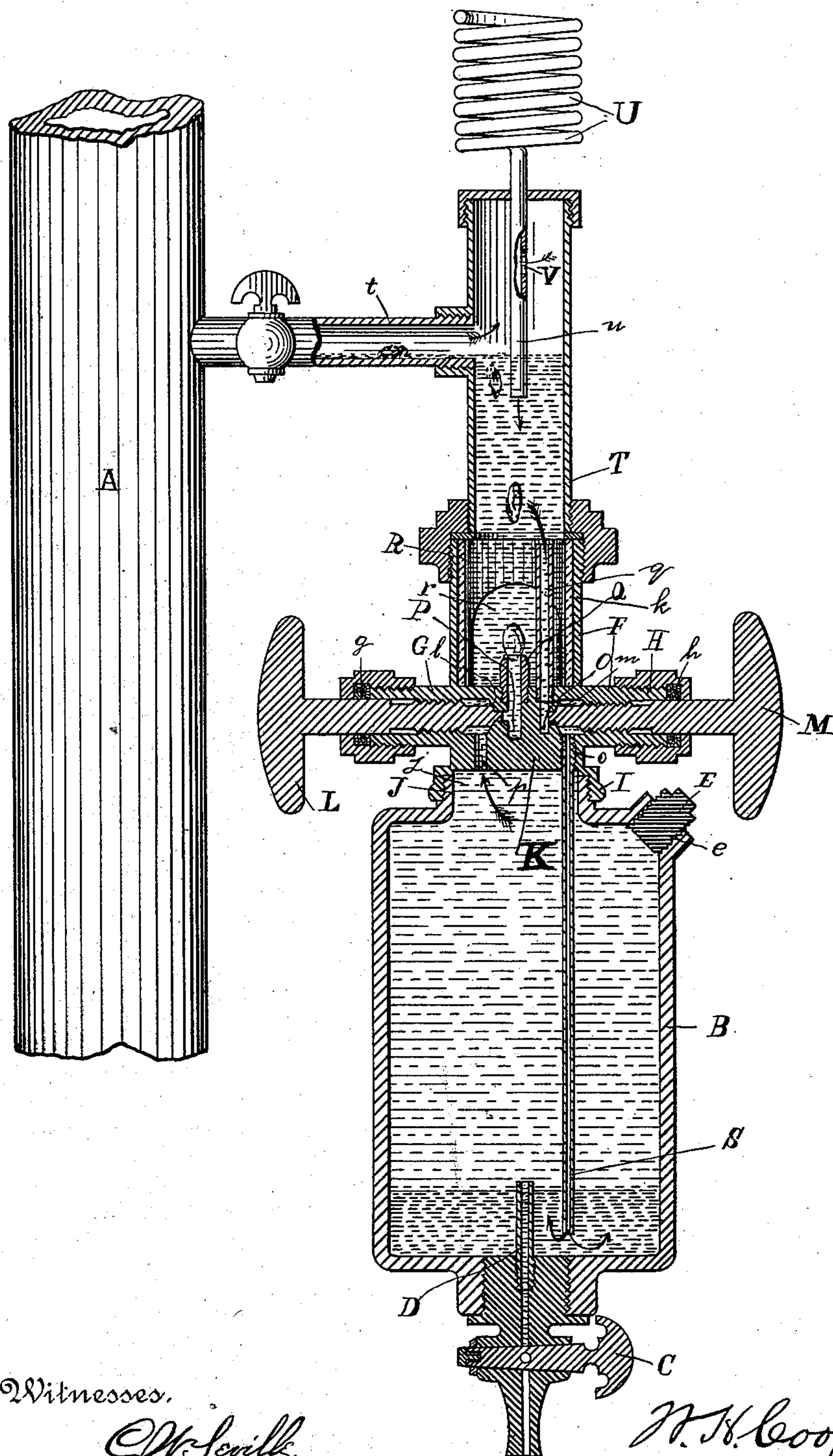


(No Model.)

W. H. COOPER.
LUBRICATOR.

No. 402,404.

Patented Apr. 30, 1889.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM HENRY COOPER, OF SAN JOSÉ, CALIFORNIA, ASSIGNOR OF ONE-HALF TO CHRISTIAN ANDERSON FOX, OF SAME PLACE.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 402,404, dated April 30, 1889.

Application filed January 24, 1889. Serial No. 297,415. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HENRY COOPER, of San José, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Lubricators; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which form part of this specification, in which the drawing illustrates a central vertical section through my improved lubricator as applied to a steam-pipe.

This invention is an improved lubricator of the class known as "condensation feed;" and its objects are to improve and simplify the construction of the same, whereby the steam entering the condenser and the oil passing to the steam-pipe both flow through the same pipe, and only one connection is made between the lubricator and steam-pipe.

The invention consists in the novel construction and arrangements of parts in the lubricator, and has especial reference to the condenser and to the arrangement of steam and oil passages, all of which are hereinafter clearly explained.

Referring by letters to the drawing, A designates a steam-pipe, which may lead to the cylinders or other steam-valves which it is desired to lubricate, and to which is connected my improved lubricator, that is constructed as follows:

B represents a metallic oil-cup, which can be closed steam-tight. In the bottom of this cup is a petcock, C, communicating with a short upwardly-standing drain-tube, D. In the upper part of the cup is a screw-threaded opening, *e*, closed by a screw-cap, E, through which opening oil can be supplied to the cup.

F designates a T-shaped valve-casing having two horizontal arms, G H, and a depending internally-screw-threaded portion or lip, I, which engages a thread on an annular flange, J, that surrounds an opening, *j*, in the upper end of cup B. A partition, K, is formed in casing F, just above lip I, and above this partition is a tubular extension, *k*, as shown.

The arms G H are both hollow, and in them work valve-stems L and M, which are pro-

vided with proper handles, and are retained in the arms by stuffing-boxes *g* and *h*, as shown.

O is a passage leading partly through partition K from above downward, and terminating in a lateral valve-seat, *m*, which is adapted to receive the end of valve M, which can thus be made to close passage O.

o is a passage leading from the interior of arm H through partition K, and establishing communication between cup C and passage O when the valve M is unseated.

P is a passage formed in partition K and terminating in a lateral valve-seat, *l*, which is adapted to be closed by valve L, as indicated; and *p* is a passage leading from the interior of arm G, through the partition, and establishing a communication between cup C and passage P when valve L is unseated.

Q is a nipple screwed into the upper end of passage P, and rising slightly in extension *k* of the casing *q* is a tube screwed into the passage O and rising nearly to the top of extension *k* above nipple Q. Sight-openings *r r* are formed in the sides of extension *k*, which openings are closed by a short tube of glass, R, fitted in extension *k*, exterior to the nipple and tube *q*.

S designates a tube screwed into the opening *o* and depending in cup B to a point near the bottom thereof and below the upper end of tube D therein.

T is a tube fitted to the upper end of extension *k* by a suitable coupling, and at a proper point above said extension the tube is connected by a lateral branch pipe, *t*, with pipe A, as shown, pipe *t* being properly valved to shut off steam from the lubricator, if necessary. The upper end of tube T is closed in suitable manner, and into it enters the end *u* of a coil, U, that stands outside the tube, as shown, and has its upper end closed. The end *u* of the coil within tube T extends below or to the opening of pipe *t* therein, and above said opening the said end is perforated, as at V, to permit dry steam to enter the coil.

The joints of the lubricator are made steam-tight, so that the communication is only established with the interior thereof through the single pipe *t* when the lubricator is in condition for use.

The operation of the lubricator is as follows: After pipe *t* has been properly connected to pipe A enough water is poured into cup B through opening *e* to cover the lower end of pipe S, and then the cup is filled with a proper lubricating-oil and cap E replaced. The valve in pipe *t* is then opened, permitting live steam to enter pipe T and fill the coil U, where it condenses and drips from said coil into pipe T and gradually fills the same. Valves L and M are then unseated and the condensed water passes through pipes *q* and S into the cup B, displacing the oil therein, which, as the condensed water accumulates, passes up through passages P *p* and escapes into pipe T through nipple Q. The condensed water fills pipe T as high as pipe *t*, so that the oil rising to the top of the water therein passes out pipe *t* to pipe A, where it is carried by the live steam to the valves which it is destined to lubricate. The coil U facilitates the condensation of the steam, and while its lower end lies below pipe *t*, yet dry or live steam can enter it through opening V, so that there is no liability of the coil becoming full of water and the condensation is regular. By properly adjusting valves L and M the amount of oil delivered in a certain time can be regulated with nicety, and its escape from cup B can be observed through openings *r r*. Pipe *q* is extended upward in extension *k*, so that the latter cannot be entirely drained of water, and the water prevents sudden or violent strain on the glass by heating and pressure when the valve in pipe *t* is first opened. Pipe D obviates the liability of cup B being entirely emptied when the petcock is opened, so that after the first filling the engineer will only have to attend to the cup being filled with oil. When filling a cup after the lubricator is attached to an engine, the valves L and M are cut off.

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

1. The combination of the oil-cup, the casing connected thereto having oil and water passages valved, as described, and sight-openings, and the pipe connected to said casing and to the main steam-pipe, the pipe *q*, rising in said casing, with the water-pipe depending

in said cup, and the coiled condenser U, having depending perforated portion *u*, substantially as described.

2. The combination of the oil-cup and the casing having a partition provided with valved oil and water passages, the vertical pipe communicating therewith and connected at a single point with the main steam-pipe, with the coiled condenser U, connected to the upper end of said vertical pipe and having its inner end depending therein and perforated above its point of connection with the main steam-pipe, substantially as and for the purpose set forth.

3. The combination of the oil-cup and the valve-casing F, having partition K, formed with oil and water passages, and a tubular extension above said partition, the valves closing said passages, the pipe depending in said cup and connected to the water-passage, and the pipe T, connected to said extension above the passage, with the pipe *t*, connecting pipe T and the main steam-pipe, and the condenser-coil U, outside of and above pipe T, and having an end depending therein and perforated above the point where pipe *t* opens thereinto, substantially as described.

4. In a lubricator, the combination of the oil-cup having a petcock and drain-pipe D, and the valve-casing F, connected to said cup and having a partition, K, provided with oil and water passages, the valve-stems for closing said passages, and a tubular extension, *k*, above said partition having sight-openings *r*, closed by a glass tube, and the pipe S, connected to the water-opening and depending in the oil-cup below the upper end of pipe D, and the tube *q* in extension *k*, communicating with the water-passage, and the nipple Q, connected to the oil-passage, with the pipe T, connected to extension *k*, the valve-pipe *p*, making a single connection between pipe T and the steam-pipe, and the condenser-coil U, all substantially as specified.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

WM. HENRY COOPER.

Witnesses:

I. N. KNOX,
GUY H. SALISBURY.