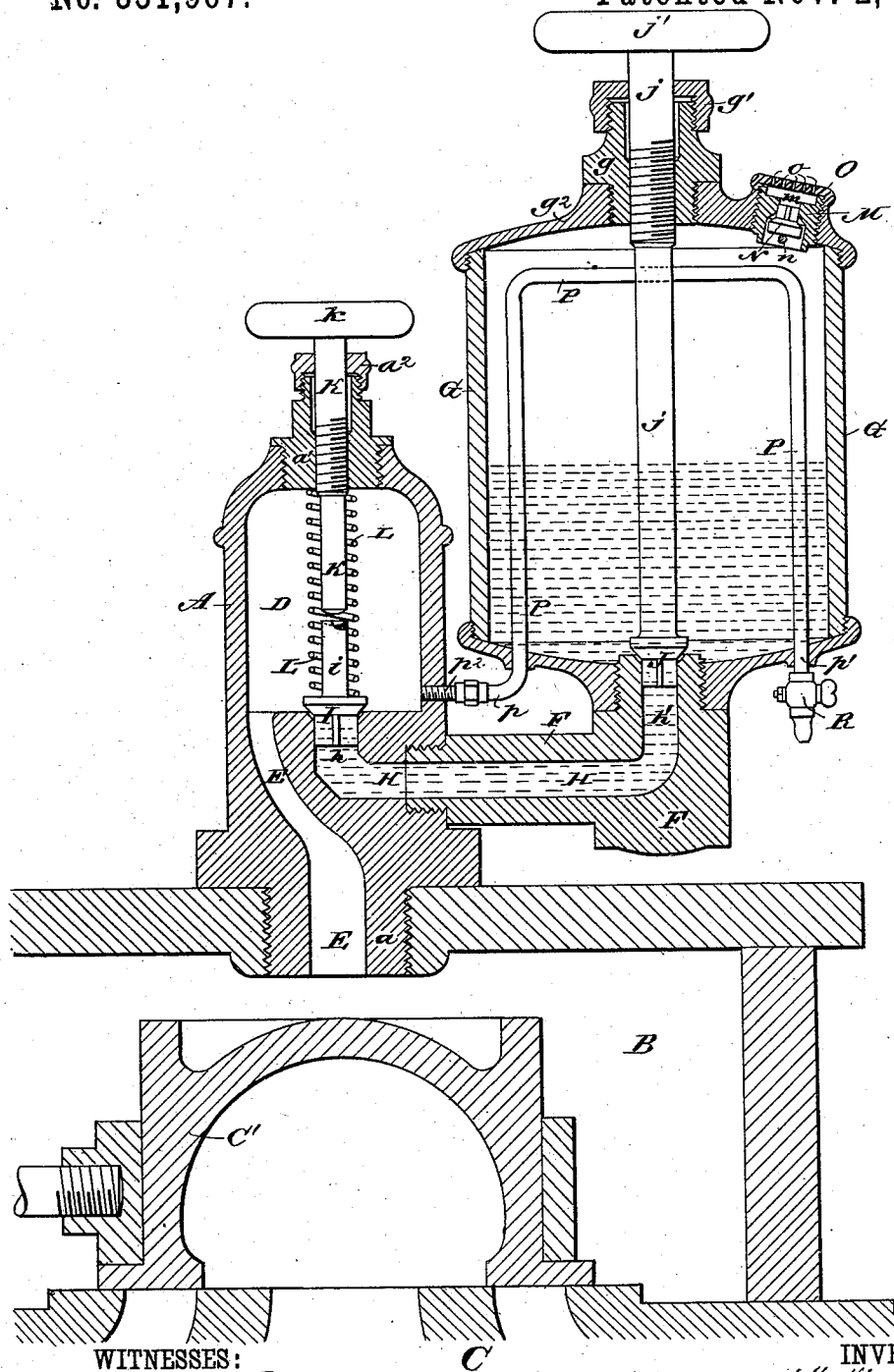
(No Model.)

T. DAVIS & H. H. McDONOUGH.

LUBRICATOR.

No. 351,967. Patented Nov. 2, 1886.



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THOMAS DAVIS AND HENRY H. McDONOUGH, OF EAST BOSTON, MASS.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 351,967, dated November 2, 1886.

Application filed April 23, 1886. Serial No. 199,932. (No model.)

To all whom it may concern:

Be it known that we, THOMAS DAVIS and HENRY H. McDONOUGH, both of East Boston, in the county of Suffolk and State of Massachusetts, have invented a new and Improved Lubricator, of which the following is a full, clear, and exact description.

Our invention relates to lubricators of that class used to supply oil to the valves of locomotive or hoisting engines wherein the live steam is often shut off from the cylinder, and has for its object to provide a simple, inexpensive, and effective device of this character.

The invention consists in certain novel features of construction and combinations of parts of the lubricator, all as hereinafter fully described and claimed.

Reference is to be had to the accompanying drawing, forming a part of this specification, and which is a vertical sectional elevation of our improved lubricator, shown as applied to the steam-chest of an engine cylinder, which is shown only in part.

The oil-delivering cup or vessel A has a screw-neck, *a*, by which it is held to the cover of the steam-chest B of an engine-cylinder, C. Within the cup A there is a chamber, D, for the circulation of oil and steam, as hereinafter explained. From the chamber D a port, E, leads to and through the cup-neck *a* into the steam-chest B. To one side of the cup A, below the chamber D, there is screwed one end of an elbow, F, to the outer upturned end of which the oil-reservoir G is connected, preferably by a screw-joint. An oil-port, H, is formed in the elbow F and the base of the cup A, and in and over the upturned ends or outlets *h h'* of said port are fitted the valves I J, respectively, of the cup A and oil-reservoir G. The valve I has a short stem, *i*, and over this stem there is screwed into the cap or plug *a'* of the cup A a spindle, K, which has a hand-wheel, *k*, by which it may be turned to set the lower extremity of the spindle nearer to or farther from the upper end of the stem *i* of valve I, to control the extent of opening of the valve, and consequently regulate the feed of oil from port H into the chamber D of cup A by the exhaust in the steam-chest, as hereinafter explained. An ordinary gland, a^2, compresses a packing around the spindle K. A spiral spring, L, placed around the spindle K and valve-stem *i*, normally holds the valve I to its seat, but will allow the valve to be lifted by the exhaust or suction in the steam-chest. The stem or spindle *j* of the valve J is screw-threaded into the cap or plug *g* of the reservoir G, and has a hand-wheel, *j'*, by turning which the valve J may be set open more or less to govern the quantity of oil passing it from the reservoir into the oil-port H. A gland, *g'*, presses a packing around the valve-stem *j*.

Into the top of the oil-reservoir G there is fitted a screw-plug, M, which has a central passage, *m*, into which is fitted a valve, N, which may fall open, as shown, against a retaining-pin, *n*, crossing the passage *m*, and to the top of the plug M there is screwed or fitted a cap, O, which has a series of holes, *o*, giving vent to the reservoir G. A pipe, P, preferably of U-form, projects at its ends *p p'* through the bottom of the reservoir G, and at its end *p* has a connection by a suitable hollow coupling, p^2, with the chamber D of the cup A, and at its other extremity, *p'*, a suitable valve or pet-cock, R, is fitted. This pipe P receives live steam from the chamber D of the cup A, and keeps the oil in the reservoir G hot or warm, so it will flow freely; and, if at any time extra heat is desired or the pipe P is to be cleared of water of condensation, the pet-cock R will be opened to give free circulation of live steam through the pipe for as long as may be required.

The operation of the lubricator is as follows: When the throttle of a locomotive or other engine carrying the steam-chest B and cylinder C is open, and steam under boiler-pressure is admitted to the steam-chest, the steam will pass through the port E into the chamber D of cup A, and will hold the valve I to its seat and prevent escape of oil from the port H into the chamber D of cup A, and, as the live steam in the chest B is itself a good lubricant for the opposing faces of the cylinder C and valve C', a feed of oil to the valve when the cylinders are taking steam would be wasteful, hence the closure of the valve I by the steam-pressure promotes the economical use of the oil. When the throttle-valve is closed to cut off the supply of steam to the chest B, the continued working of the valve C' in the chest will produce an exhaust or suction sufficiently strong

to lift the valve I from its seat occasionally and against the tension of the spring L, the adjustment of the spindle K controlling the lift of the valve, and consequently the amount of oil which will pass the valve I and flow through the port E into the steam-chest at each lift or opening of the valve by the exhaust. By providing springs L of varying tension the valve I will open more or less frequently, as may be required for any particular engine. The plug *a'* of cup A may be removed easily for access to the spring L and valve I. Should the valve I become disarranged or inoperative and remain open, so that live steam from the chest B, port E, and chamber D pass the valve J into the reservoir G, the pressure of the steam on the oil in the reservoir would automatically close the valve N and prevent waste of oil through the vent-holes *o* of the cap O, as will readily be understood.

It is evident that the pressure of the steam operates only to close the oil-feed valve I and cut off the supply of oil to the valve C' in the steam-chest; hence the oil will be fed to the engine-valve by exhaust action only, and when the steam supply to the chest B is cut off and the lubricating properties of live steam are not available to relieve the friction of the valve C' on its seat.

To charge the reservoir with oil, the valve-plug M will be removed; or, if preferred, the entire screw top or head g^2 of the reservoir may be removed for this purpose or for access to the interior of the reservoir for cleaning it when required.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The combination, in a lubricator, of an oil-cup, A, chambered at D, and having a port, E, an oil-reservoir, G, a port, H, connecting cup A and reservoir G, a valve, I, on port H in chamber D, and a spring, L, normally closing said valve, substantially as described, for the purposes set forth.

2. The combination, with the oil-cup A, chambered at D, and having a port, E, and connected with an oil-reservoir, substantially as specified, of a valve, I, and a gage-spindle, K, substantially as described, for the purpose set forth.

3. The combination, with the oil-cup A, chambered at D, and having a port, E, and connected with an oil-reservoir, substantially as specified, of a valve, I, a gage-spindle, K, and a spring, L, substantially as described, for the purposes set forth.

4. The combination, in a lubricator, of an oil-cup, A, adapted for connection to a steam-chest, and provided with a chamber, D, and port E, and an oil-reservoir, G, an oil-port, H, connecting chamber D with the reservoir, valves I J, adapted to port H, in the cup A and reservoir G, respectively, and a pipe, P, connected to the chamber D of cup A and ranging through the reservoir to heat the oil therein, substantially as herein set forth.

5. The combination, in a lubricator, of an oil-cup, A, having chamber D and port E, an oil-reservoir, G, a port, H, connecting said reservoir with the chamber D, of cup A, a valve, I, and a live-steam-circulating pipe opening into chamber D and ranging through the reservoir G, substantially as described, for the purposes set forth.

6. The combination, in a lubricator, of an oil-cup, A, having chamber D and port E, a reservoir, G, a port, H, a valve, I, a pipe, P, opening into chamber D and ranging through the reservoir G, and a cock, R, on said pipe, substantially as described, for the purposes set forth.

7. The combination, in a lubricator, and with the cup A, having chamber D and port E, an oil-reservoir, G, a port, H, connecting the cup and reservoir, and a valve, I, fitted on port H, and to be closed by steam-pressure and opened by exhaust from the cylinder, substantially as specified, of a vent and valve device, M N O, substantially as described, for the purpose set forth.

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Witnesses:
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