R. W. TAVENER.
Lubricator.

No. 210,371. Patented Nov. 26, 1878.

Fig. 1.

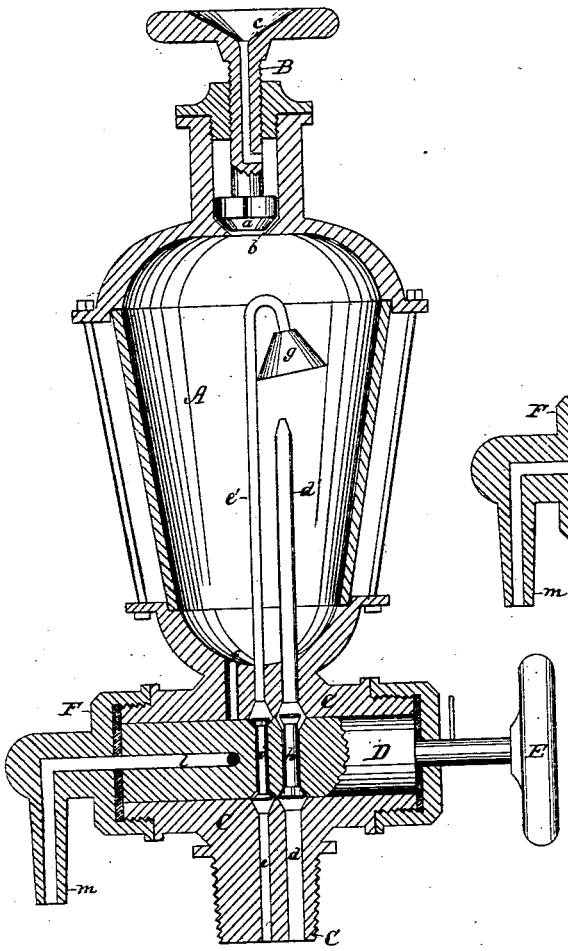


Fig. 2.

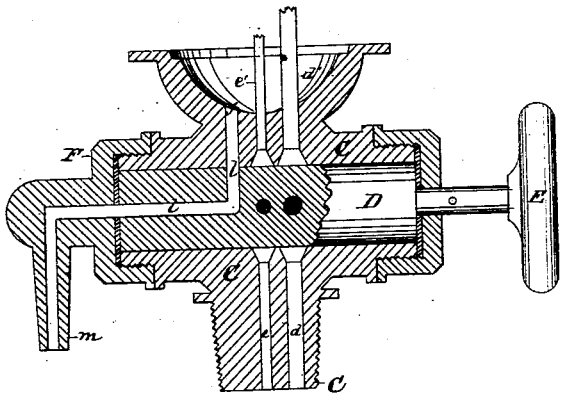


Fig. 4.

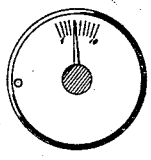


Fig. 3.

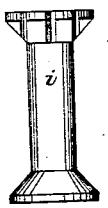
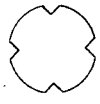


Fig. 5.



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UNITED STATES PATENT OFFICE.

ROBERT W. TAVENER, OF WEST BAY CITY, MICHIGAN, ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRY H. HARRINGTON, OF SAME PLACE.

IMPROVEMENT IN LUBRICATORS.

Specification forming part of Letters Patent No. **210,371**, dated November 26, 1878; application filed September 3, 1878.

To all whom it may concern:

Be it known that I, ROBERT W. TAVENER, of West Bay City, in the county of Bay and State of Michigan, have invented a new and Improved Automatic Lubricator for Locomotives; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to a lubricator or oil-cup designed to be attached to the steam-chest of a locomotive, and depending for its automatic feed or operation upon the intermittent injection of steam into it. The cup is provided with suitable valves for admitting steam and permitting the exit of the oil, and also for facilitating the discharge of sediment, as occasion requires. The steam is admitted intermittently, or at each stroke of the piston, through a vertical tube, which extends upward above the middle of the oil-chamber, and the oil-conducting tube terminates in an inverted funnel, which is placed immediately over the upper end of such steam-induction tube, so that as the steam enters it will force a portion of the oil which covers the mouth of the steam-tube into the funnel and down the oil-tube to the rubbing-surfaces requiring lubrication.

The special advantage or superiority of my invention is its economy in the use of oil, its operation being directly dependent on that of the engine, and the oil feed or supply being always more or less, according to the speed of the engine.

The details of construction and arrangement of parts will be understood from the following description, reference being had to the accompanying drawing, in which—

Figure 1 is a vertical section of my improved device. Fig. 2 is a vertical section of a part of the same, showing another position of the adjustable plug. Fig. 3 represents one of the valves detached and enlarged. Fig. 4 is a detail view. Fig. 5 is a plan of the valve shown in Fig. 3.

The oil is supplied to the cup or reservoir A at requisite times and in requisite quantities through a receiver, B, which is a hollow screw-threaded plug fitted in the neck of the reservoir, and provided at its lower end with a conical enlargement, *a*, which constitutes a valve that seats on a correspondingly-shaped apertured piece, *b*. The sides of the valve *a* are grooved or notched vertically to allow the oil to flow past it into the reservoir A, when the valve is raised from its seat by screwing the plug B upward. The top *c* of the plug B is made concave on its upper side to facilitate the admission of oil, and it is also enlarged to serve as a wheel for turning and adjusting the plug B.

The reservoir A is supported on a standard or stem, C, which is screw-threaded to adapt it for attachment to a steam-chest or cylinder, and provided with two passages, *d e*—one, *d*, for steam, the other for oil—which extend its entire length, and with a third but shorter passage, *f*, for discharge of sediment from the reservoir.

The steam-passage *d* is continued upward by means of a tube, *d'*, above the middle of the oil-chamber, and the other oil-passage, *e*, by a similar tube, *e'*, to a still higher point, where it terminates in a funnel, *g*, that is inserted directly over the mouth of tube *d'*.

The upper portion of the stem C is enlarged spherically and bored transversely to receive a cylindrical plug, D, which is rotated, and thereby adjusted in the required manner, by means of a hand-wheel, E.

Two valves, *h i*, are placed in passages that pass transversely through the plug D. One valve, *h*, seats downward and the other valve, *i*, upward; but each has a nut on its tail end, which is notched to allow the flow of fluid past it. One valve, *h*, is in line or registers with the steam-passage *d*, and the other valve, *i*, with the oil-passage *e*. Hence, when the plug D is adjusted, as shown in Fig. 1, the valves will allow the admission of steam from the steam-chest to the reservoir A and the descent of oil into the steam-chest reciprocally.

To describe the operation more particularly: When the piston goes down, the valve *h* is raised and opened, and steam or water of condensation and steam together are forced up

through passage d d', and, being emitted as a jet from tube d', drive more or less oil into the funnel g. When the piston comes up again, the oil thus forced into the tube e' passes down passage e, past the open valve i into the steam-chest. Thus at each reciprocation of the piston a small quantity of oil is supplied to the friction-surfaces, and it is hence apparent that the aggregate quantity supplied in a given time will always vary proportionately to the work of the engine in such time, being greater when the speed is greater and less when the speed is less. The quantity of oil admitted at each pulsation or stroke of the piston may also be regulated at will by adjusting the plug D on its axis, so as to diminish the available size of the passages through it in which the valves are placed. Thus the amount of oil consumed in running a given distance may be positively controlled by the engineer without affecting the operation of the lubricator. When the engine is not working the valve i remains closed or seated downward, so that it allows any oil that may adhere to the inside of tube e' to drip into the steam-chest.

It is obvious that by turning the plug one-quarter round the valved passages will be closed and communication cut off between the oil-cup and steam-chest. This position of the plug, as shown in Fig. 2, also brings into coincidence the passage in the end of the plug and the opening l leading into the oil-cup. The sediment can be drawn off through this passage and allowed to escape from the nozzle F, which is attached to the hollow cap applied to the globe.

While my invention is intended chiefly for locomotives, it is also applicable to stationary engines, and may be used for journal-bearings by running a steam-pipe from the steam-chest.

What I claim is—

1. In a lubricator, the combination, substantially as described, with an oil-reservoir, of a steam-injection passage and tube and an oil-conducting passage and tube, the latter having its mouth facing that of the steam-tube.

2. In a lubricator, the combination, substantially as shown and described, of the oil-cup, the steam and oil passages and tubes, arranged as specified, and the valves seated in reverse directions, as and for the purpose set forth.

3. In a lubricator, the combination of the adjustable hollow oil-feed plug, having a lateral orifice and notches or grooves in its conical end, and the neck of the oil-reservoir, all constructed as shown and described.

4. In a lubricator having an aperture in the bottom for the discharge of the sediment and a plug with angular passage registering with said aperture, the cap F, made in one piece with the nozzle m, and attached to a fixed part of the lubricator, so as not to move with the plug, all constructed and arranged substantially as shown and described.

ROBERT W. TAVENER.

Witnesses:
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