E. McCoy.

Lubricator.


INVENTOR

ATTORNEY

WITNESSES

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E. McCoy.
Lubricator.

No. 255,443.

Patented Mar. 28, 1882.

Fig. 2.

Fig. 3.

Inventor

By

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Witnesses

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ELIJAH McCoy, OF DETROIT, MICHIGAN, ASSIGNOR TO HENRY C. HodGES AND CHARLES C. HodGES, OF SAME PLACE.

LUBRICATOR.


Application filed October 21, 1881. (No model.)

To all whom it may concern:

Be it known that I, ELIJAH McCoy, of Detroit, county of Wayne, State of Michigan, have invented a new and useful Improvement in Lubricators; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention consists of the combinations of devices and appliances hereinafter described, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a view, half in elevation and half in section, illustrating my invention. Fig. 2 illustrates a variation in the method of connecting the gage-glass and its stop-cocks with the body of the lubricator, the gage-glass being set into the side of the reservoir. Fig. 3 illustrates another variation, in which the end of the gage-glass is fixed by a separate plate which is fastened to the body by screws.

Heretofore in the construction of lubricators, and especially those designed for use upon the cylinders of locomotives, great difficulty has been experienced by reason of the oil wasting at the moment the steam is cut off from the dry-pipe and while the engine is still in motion. The difficulty may be explained as follows: When steam is in the steam chest and cylinder it also rises within the lubricator and establishes an equilibrium therein. Condensation then takes place quite rapidly. The oil is floated upon the condense-water, and being held back by the valve which governs the rapidity of feed, it is not permitted to escape as rapidly as condense-water is formed, so that it soon fills the reservoir and rises above the top of the discharge-pipe. Now, when the steam is cut off—as, for instance, in coming into a station, or when going down a grade—the engine begins to "pump a vacuum," as it is termed. It at once destroys the equilibrium which before existed in the body of the cup, and instantly sucks out all that quantity of oil which is above the level of the top of the discharge-pipe. It is desirable that a little oil should thus accumulate and be discharged upon the valves the moment they begin to pump a vacuum; but in cups as ordinarily constructed this amount is not graduated and amounts to an absolute and useless waste of the lubricant.

In overcoming this difficulty my invention consists, first, in the combination, with the main oil-chamber, of a lubricator, and a discharge-tube projecting therein, of a plunger fitting said chamber above said tube and adapted to separate an upper extension of the chamber from the portion below, and means for adjusting said plunger from the exterior of the lubricator, whereby the space in which oil may collect above the opening of the discharge-pipe may be regulated, so that the engineer may know just how much oil will be sucked out, and may control the quantity at pleasure; second, in the combination, with the oil-chamber, discharge-pipe, and adjustable plunger, as above, of an adjustable exterior indicator connected with the plunger, so that its adjustment may be readily determined; third, in the combination, with the glass indicator-tube, of a lubricator and a slotted stationary metallic casing surrounding said tube, of a similarly slotted movable metallic casing surrounding said stationary casing and arranged to partially rotate thereon, whereby the indicator-tube may be thoroughly covered for protection and readily exposed for observation when desired; fourth, in means for protecting and adjusting the packing-securing spring, which permits the indicator-tube to expand and contract without impairing its packing; and the invention also consists in the combination of novel details of construction, which will be hereinafter fully described and claimed.

In carrying out my invention, A is the oil-chamber of a lubricator. B is the discharge-pipe, through which steam is also admitted to the interior of the oil-chamber. C is a cylindrical cavity in the top of the cup. D is a plunger or piston, preferably a close-fitting or steam-packed piston, attached to an adjustable stem, D'. This plunger D serves as a partition separating the chamber C, which
is in fact an extension of the oil-chamber from the main portion of the oil-chamber below, and
by adjusting this partition the area of the
chamber C, which is in connection with the
main portion of the oil chamber, may be regu-
lated.
E is a graduated bar, loosely connected with
the stem D and passing through or by a fixed
index finger or arm, E'.
F is an indicator-glass, to show the relative
height of oil and condensate-water.
G and G' are stop-cocks of any suitable na-
ture, so located as to cut off at the will of the
engineer all communication with the interior
of the cup through the passages or ducts g g'.
H is a packing-ring or gasket, located at the
top or bottom, if desired, of the indicator-glass.
H' is a metallic or other suitable follower,
and H" a spring for forcing the gasket against
the glass with an effective yet a yielding pres-
sure.
B" is a screw plug.
It will be observed that the discharge-pipe
B rises to or a little above the base of the cy-
linder C. The object of this construction is
that the condensate-water within the oil-cha-
mer may lift the oil to the top of the chamber
and leave no vacant space, except the small cy-
linder C. This then alone becomes the con-
densing-chamber, and the size of this chamber
is determined by the adjustment of the piston
D. The engineer can see at a glance by the
graduated scale E the exact location of the pis-
ton and consequent size of the condensing-
chamber. He soon learns the proper size of
condensing-surface to give him the necessary
rapidity of condensation, and may vary it, if
required, to correspond with the general tem-
perature, so as to make it less in winter and
more in summer. This feature of an adjust-
able condensing-surface is applicable in all lu-
bricators in which oil is displaced by condens-
ate-water, no matter what its form or where
the location of its condenser, and no matter whether
the latter be directly or indirectly connected
with the oil-chamber. In the instance shown
the adjustable piston D is designed also to ac-
complish another object—viz., it fixes the
amount of oil that can rise above the end of the
discharge-pipe, and consequently the quantity
that will be discharged when steam is shut off
and the cylinder begins to pump a vacuum.
This amount can of course be made more or
less, according as the piston is adjusted to a
higher or a lower point, and the degree of the
adjustment and location of the piston is shown
by the graduated arm E. This graduated scale
may be arranged in any other suitable way to
show this adjustment; and I do not limit my-
selves to the peculiar construction illustrated,
though it answers every purpose.
The stop-cocks G and G' may be located at any
desired point, either as shown in Fig. 1, or at
the top and bottom of the indicator-glass, as
shown in Fig. 2. So, also, the indicator-glass
may be arranged as shown in either Figs. 1 or
2; or, as shown in Fig. 3, it may be seated at
its end in a plate, which plate is in turn fast-
ened by screws to the body of the cup with a
suitable lead sheet or other interposed pack-3.
I is a drain-cook for draining off sediment,
and may be employed in any of the lower stop-
cocks, G'.
F' is a metallic casing provided with open-
ings f. It surrounds and protects the glass
tube. F" is a sleeve provided with similar
openings, f". It surrounds the casing F', and
the glass tube may be totally incised and hid-
4den from view by turning simply the sleeve
F' a quarter around its own axis. The stop-
cocks enable the engineer at any time to cut off
the indicator-tube if it gets broken, or if de-
sired to clean the interior of the glass, and
the sleeve enables the engineer to expose the
glass at any moment to see the state of the oil,
and then close it off so it cannot be broken
accidentally. The spring H permits the cup
or glass to expand or contract freely without
injuring the glass. These lubricators have proven of great value upon the steam-chests of locomotives, and by
reason of the features described have de-
veloped a great economy over other lubricators
of this type, both in the saving of oil and
reduced breakage. The upper end of the dis-
charge-pipe is made flat, and likewise the
lower surface of the piston D, so that, when
desired, in cold weather the engineer can close
the exit-pipe at its top by running the piston
down upon it, thus permitting steam to rise to
this point and keep the cup from freezing, yet
not admitting the steam to the interior of the
cup.
J is a valve for regulating the rate of feed
of the oil.

What I claim is—
1. In a lubricator, the combination, with the
main oil-chamber and a discharge-tube pro-
jecting therein, of the plunger separating
an upper extension of said oil-chamber above the
discharge-pipe from the lower portion of said
chamber, and means for adjusting said plunger
from the exterior of the lubricator, substi-
tually as described.
2. In a lubricator, the combination, with the
oil-chamber, the central discharge-tube, and
the adjustable plunger arranged above said
bube, of an adjustable exterior indicator con-
cected with said adjustable plunger, substi-
tually as and for the purpose set forth.
3. In a lubricator, the combination, with the
glass indicator-tube and a slotted stationary
metallic casing surrounding said tube, of a
similarly slotted movable metallic casing sur-
rrounding said stationary casing, and arranged
to partially rotate thereon, substantially as de-
scribed.
4. The combination, with the glass indica-
tor-tube F', properly seated and packed at its
lower end, of the packing-ring at its upper
eend, the follower resting upon said packing-
ring, the spring having its lower end bearing
upon said follower, the casing inclosing said spring, and screw-plug screwed into said casing and bearing upon the upper end of said spring, substantially as described.

5. The combination, with a main oil-chamber, A, and the discharge and steam tube B extending therein, of the condensing-chamber C, the plunger D, fitting closely and sliding in said chamber C, and the adjustable stem D', attached to said plunger and projecting to outside the casing, substantially as described.

In testimony whereof I sign this specification in the presence of two witnesses.

ELIJAH McCOY.

Witnesses:

J. EDWARD WARREN,
SAMUEL E. THOMAS.