

No. 636,532.

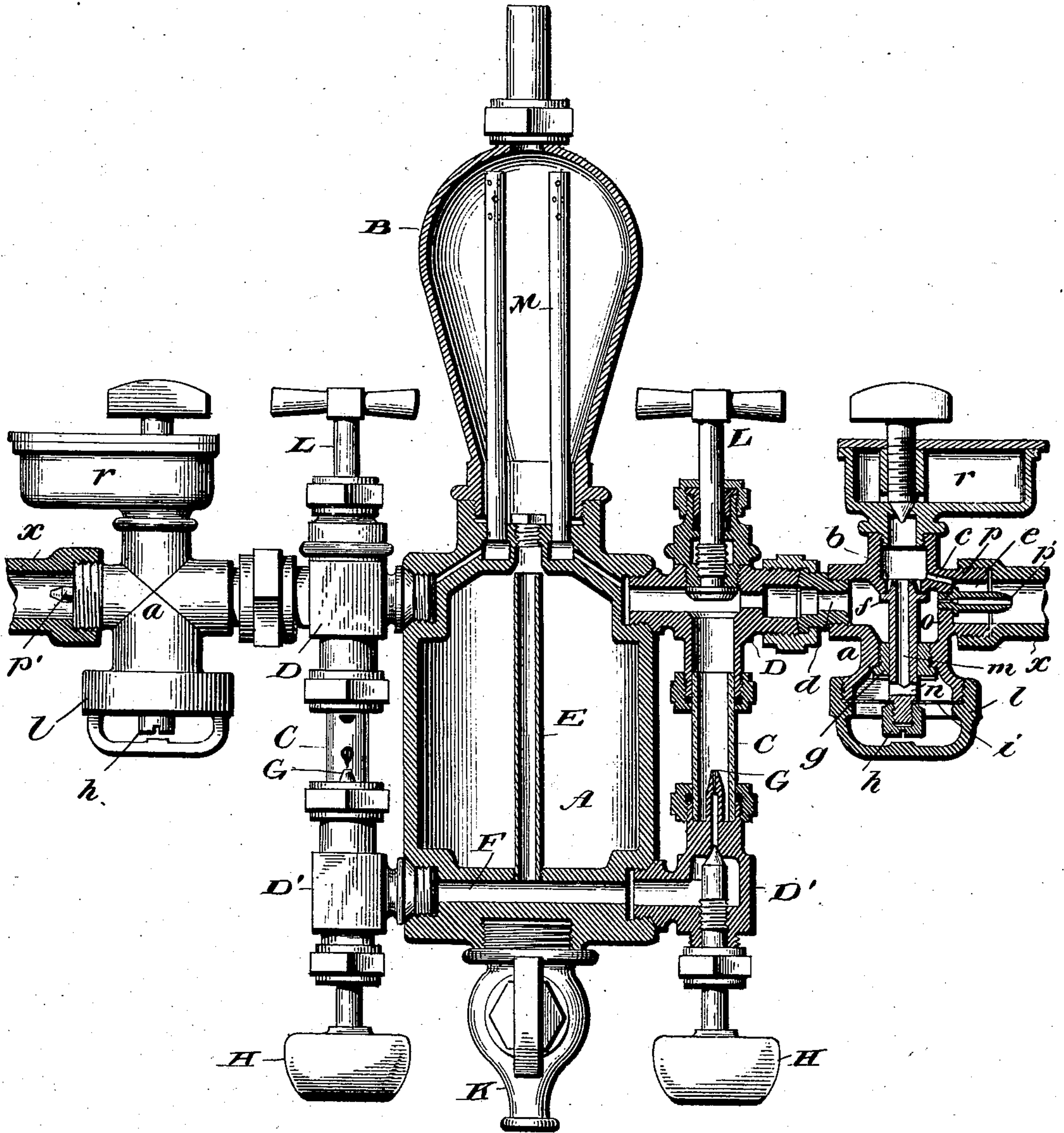
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L. KACZANDER, & J. DESMOND & R. RUDDY.

LUBRICATOR.

(Application filed Nov. 12, 1896.)

(No Model.)



Witnesses:

L. C. Mills.
E. W. H. Dick

Inventors:

Leopold Kaczander
John Desmond
Robert Ruddy
By Marceline Bailey Atty.

UNITED STATES PATENT OFFICE.

LEOPOLD KACZANDER AND JOHN DESMOND, OF NEW YORK, AND ROBERT RUDDY, OF MOUNT VERNON, NEW YORK, ASSIGNORS TO THE NATHAN MANUFACTURING COMPANY, OF NEW YORK.

LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 636,532, dated November 7, 1899.

Application filed November 12, 1896. Serial No. 611,874. (No model.)

To all whom it may concern:

Be it known that we, LEOPOLD KACZANDER and JOHN DESMOND, residents of the city of New York, in the county of New York, and ROBERT RUDDY, a resident of Mount Vernon, Westchester county, State of New York, citizens of the United States, have invented certain new and useful Improvements in Lubricating Mechanism for the Cylinders and Valves of Locomotive-Engines, of which the following is a specification, reference being had to the accompanying drawing, which represents in vertical central section, partly in elevation, what is termed a "double-feed" lubricator—that is to say, a lubricator in which both of the cylinders and valves of a locomotive-engine are lubricated from one common oil-reservoir. It will be understood, however, that the number of feed-outlets in the lubricator may be varied without departure from our invention.

The lubricator is of the "sight-feed" type. We have shown in section but one of the sight-feed devices and the device connected thereto, in which our invention is embodied. The other sight-feed device, (on the left of the lubricator,) together with the device of our invention, which is connected thereto, are shown in elevation. In internal construction and arrangement they do not differ from the corresponding devices shown in section on the right of the body of the lubricator.

Our invention has relation to improved means for preventing the back pressure from the cylinder from retarding the oil-feed.

We will first describe generally the construction of that part of the lubricator which is old and will then describe more particularly and in detail the construction, arrangement, and mode of operation of the devices in which our invention is comprised.

A is the oil-reservoir, and B the condenser, which at its top is provided with a union connection, to which is attached a pipe leading to the boiler. The oil-reservoir is provided with the usual sight-glasses C and upper and lower sight-feed brackets D and D'. A pipe, which is not shown in the drawing, leads the water of condensation in the usual manner

from the condenser to the bottom of the oil-reservoir, and the pipe E leads the oil down to the channel F, which connects with the feed-nozzles G, the passage through which of the oil is regulated by the valves H in the usual way.

K is a drain-valve.

L are valves to shut off steam from the glasses in case they should break, and M are equalizing-pipes, the function and operation of which, as well as of the whole lubricator, are well known and need no detailed description.

In ordinary lubricators of this class each of the upper sight-feed brackets contains, near the outlet-point into the oil-pipes which lead to the cylinders, an outlet-nozzle with an exceedingly small opening, which, in connection with the equalizing-pipes M, serves in the usual manner to equalize the pressure within the lubricator. Owing to the fact that the steam-supply for the lubricator is directly from the boiler it is evident that the escape of steam and oil through the upper sight-feed brackets is practically continuous, even though the throttle-valve be closed and the engine motionless. It has been found, however, that when the throttle-valve is opened and steam admitted to the steam-chest the small volume of steam passing through the nozzle condenses within the oil-pipes, resulting in a reduced pressure therein. This reduced pressure is not sufficient to resist the back pressure of steam from the steam-chest, with the result that the feed of the lubricator becomes irregular and eventually stops altogether. This effect of the back pressure we overcome in the following simple and reliable manner: To each delivery end of the lubricator is attached a casing *a*, which at its delivery end *e* is to be connected to the tallow-pipe; (indicated at *x*;) leading to the steam-chest of the cylinder to be lubricated. This casing is provided internally with a very small constantly-open port or passage for a continuous current of steam and oil in limited quantity from the lubricator into the tallow-pipe and with an independent and separate valve-controlled by-passage which when open

will furnish an increased current of steam and oil from the lubricator to the tallow-pipe. These two passages with which the casing is internally provided can be formed therein in various ways. We prefer for this purpose to use the centrally and longitudinally perforated plug or nozzle *p'*, usually called the "choke-plug," which screws tightly into the partition-wall *o* of the casing and has a very small opening or port *p* in its lubricator end—that is to say, its end nearest the lubricator. This furnishes the constantly-open restricted port or passage for the continuous minimum flow of steam and oil to the tallow-pipe. The by-passage for the increased supply of steam and oil is furnished by the cavity *b*, which opens into the interior of the casing, on the one hand, and, on the other hand, communicates with the delivery end *e* of the casing through a cored or drilled passage *c*, which is formed in the body of the casing and opens into the delivery end *e* thereof at a point beyond the partition-wall *o*. Thus through the by-passage *b c* the lubricator end *d* of the casing is put in direct communication with its delivery end *e*. At the point where the cavity *b* opens into the interior of the casing it is provided with a valve-seat to receive the valve *f*, by which communication through said opening is controlled. The stem or spindle of this valve passes through and tightly fits in a guide plug or partition *g*, screwed into the interior of the casing, the stem being capable of lengthwise movement in said plug to permit the valve to open and close the by-passage. The lower and reduced end of the valve-stem passes through a sensitive flexible diaphragm *i*, of spring metal or any other suitable material, and is tightly held thereto by means of the clamp-nut *h*, and the diaphragm at its periphery is tightly clamped and held between the annular bottom flange *k* of casing *a* and the cap *l*, which screws onto said flange.

Normally the valve *f* is in closed position, being thus held when the engine is standing still or running downgrade with no steam in the cylinders by the steam from the equalizing-pipes *M*, which steam will press against the under surface of valve *f* and hold it to its seat, thus closing the by-passage between the lubricator and delivery ends *d e* of the casing. Under these conditions only the minimum supply of steam and oil will pass to the tallow-pipe, this supply being furnished through the choke-plug *p'*.

In order to open the valve *f* to furnish increased supply of steam and oil through the by-passage *b c* when required, the space in the casing above the sensitive diaphragm *i* and between it and the plug or partition *g* above should be put in communication with the tallow-pipe, so that the back pressure in that pipe whenever it exists may act on the diaphragm to depress it, and consequently to move the valve in a direction to open the by-passage. Such communication manifestly can

be established in various ways. For this purpose we in the present instance provide for such communication by forming the stem or spindle of valve *f* with a longitudinal central passage *m*, which at the top opens into by-passage *b c* and at its lower end merges into a cross-passage *n*, which opens on each side of the valve-stem into the casing *a* at a point between the diaphragm *i* and the partition or plug *g*. In this way we utilize the same by-passage for admitting back pressure from the tallow-pipe to act upon the diaphragm *i*, as well as for furnishing the increased supply of steam and oil from the lubricator to the tallow-pipe.

When valve *f* is closed, the lubricator, as above indicated, will operate as an ordinary lubricator, with a fixed outlet-nozzle. When steam, however, is admitted into the cylinders, it will pass back toward the lubricator through the tallow-pipe and, passing through the by-passage *c b* and passages *m* and *n*, will press against the upper surface of valve *f*, as well as against the upper surface of diaphragm *i*, with the result that valve *f* will be moved from its seat. In this case in addition to the small hole *p* the by-passage *b c* will be open for the passage of steam and oil into the cylinder, and the increased volume of steam thus furnished will effectually overcome the retarding effect of the back pressure from the cylinder. In consequence of the fact that the increased steam by-passage forms also an increased oil-passage the feed of the lubricator will not only not be retarded when steam is admitted into the steam-chest, but the feed will increase in rate with increasing pressure in the steam-chest, which is very desirable in locomotive practice.

As usual in this class of lubricators a hand-oiler *r* is provided, by means of which the cylinders and valves may be oiled on a downgrade in case the sight-glasses become disabled. We find it convenient and desirable to mount this hand-oiler on the casing *a* and to put it in communication with the tallow-pipe through the medium of by-passage *b c*, as shown in the drawing.

Having described our invention and the manner in which the same is or may be carried into effect, we state, in conclusion, that we do not claim, broadly, in a lubricating apparatus provided with suitable boiler, cylinder, and equalizing-pipe connections a casing located at and communicating with the delivery end of the lubricator, provided with a very small permanently-open passage for a continuous flow of steam and oil in restricted quantity from the lubricator into the tallow-pipe and with a valve-controlled by-passage separate and distinct from the minimum-supply permanently-open passage for permitting an increased flow of steam and oil from the lubricator through the casing into the tallow-pipe; but

What we do claim herein as new and of our own invention is as follows:

1. In a lubricating apparatus provided with
suitable boiler, cylinder and equalizing-pipe
connections, a casing communicating with
the delivery end of the lubricator provided
5 with a stationary choke-plug for minimum
continuous flow of steam and oil from the lu-
bricator into the tallow-pipe, a by-passage
distinct and separate from the minimum-sup-
ply permanently-open passage in the choke-
10 plug for permitting increased flow of steam
and oil from the lubricator through the cas-
ing, and a valve for controlling said by-pas-
sage, separate from and independent of the
choke-plug, and adapted to be operated by
15 the back pressure from the tallow-pipe, sub-
stantially as and for the purposes hereinbe-
fore set forth.

2. The combination with the casing *a* and
the by-passage therein, of the valve *f* for con-
20 trolling said passage contained in said casing,
and having its stem movable in a guide par-
tition or plug therein, the flexible resilient dia-
phragm *i* mounted and secured in said casing
and attached to the valve or its stem, and a

communicating passage between the tallow- 25
pipe and the space or chamber in the casing
above the diaphragm, substantially as and
for the purposes hereinbefore set forth.

3. The casing *a* provided with minimum-
supply port *p*, and the separate and inde- 30
pendent by-passage *b, c*, in combination with
the valve-operating diaphragm *i*, the valve *f*,
controlling said by-passage and provided
with passages leading from the by-passage to
the space in the casing immediately above 35
the diaphragm, and the hand-oiler mounted
on the casing and communicating with the
by-passage at a point therein above or be-
yond the valve *f*, substantially as and for the
purposes hereinbefore set forth. 40

In testimony whereof we have hereunto set
our hands this 10th day of November, 1896.

LEOPOLD KACZANDER.

JOHN DESMOND.

ROBERT RUDDY.

Witnesses:

OTTO SCHRÖDER,

JOHN MCCONNELL.