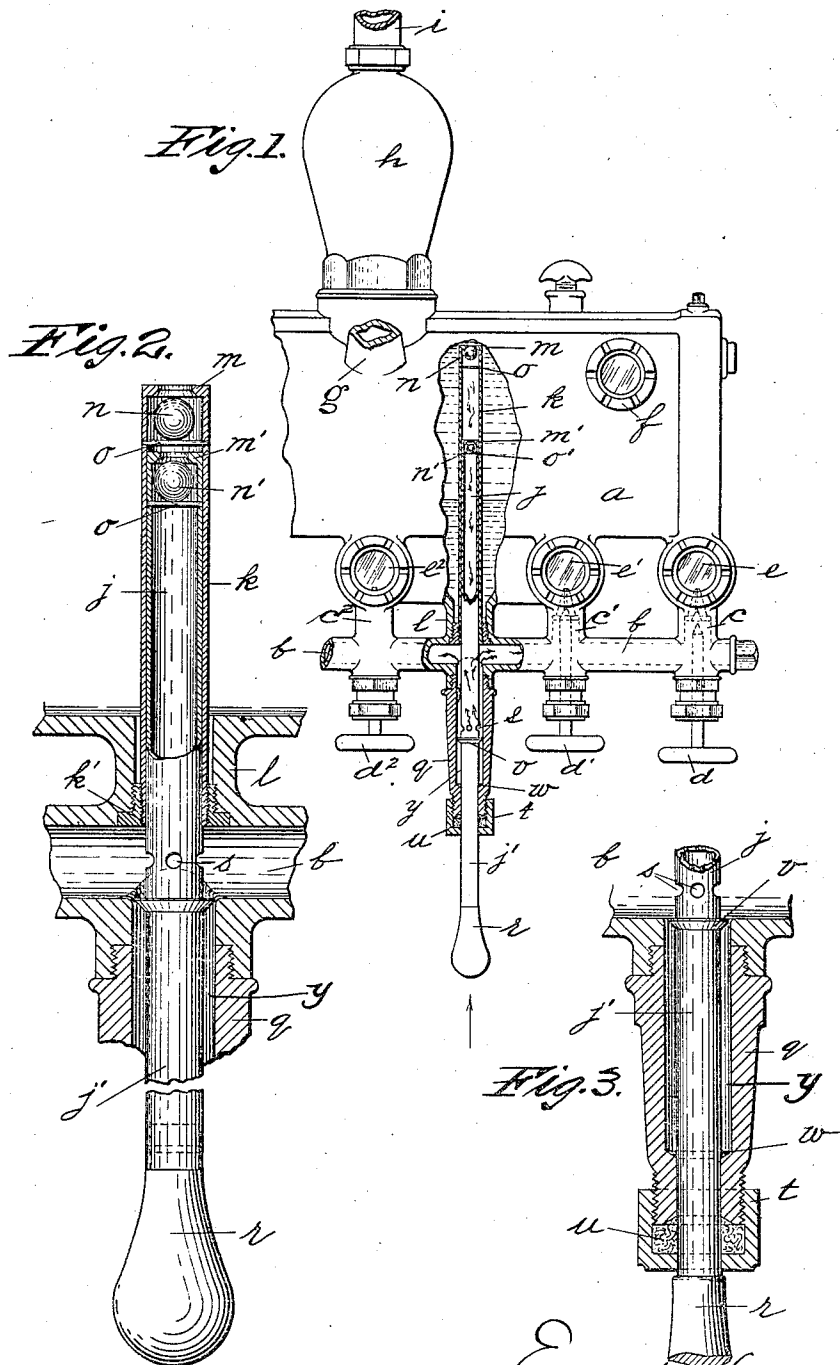


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LUBRICATOR.
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Patented Mar. 11, 1913.



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UNITED STATES PATENT OFFICE.

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LUBRICATOR.

1,055,540.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDGAR A. KELSEY, a citizen of the United States, and a resident of Mount Vernon, county of Westchester, and State of New York, have invented certain new and useful Improvements in Lubricators, of which the following is a full, clear, and exact specification.

My invention relates to lubricators and the improvement, herein set forth, and claimed as my invention, is designed to provide efficient and easily operatable means to drive an additional, or a larger volume of lubricant, into all or any of the feed pipes of the lubricator, delivering the lubricant to the parts of a machine or of an engine, whenever it may be required; and to effect this promptly and independently of, or supplementary to, the means provided in the lubricator, for automatically driving the lubricant into the feed pipes; also without interrupting, or in any way affecting, the otherwise automatic operation of the lubricator. Besides this, other purposes, as explained farther on, are effectively served, and other advantages obtained, by the use of my invention.

The construction of the device, and the manner of its combination with a lubricator, are illustrated in the accompanying drawings, wherein—

Figure 1 is a fractional elevation of a typical automatic lubricator, showing the device combined therewith; part of the casing of the cup being broken away to disclose the oil tube, or oil pipe as it is more commonly called, and a part of the detail of the device, combined therewith, being shown in sectional view; Fig. 2 is a sectional view, partly an elevation of the device, and Fig. 3 a similar view showing the construction of the piston, the socket, and of the stuffing box.

The drawings show the device combined with a lubricator of the type used on locomotive engines, *a* designating the cup or container, *b* the oil conduit and *c*, *c'* and *c''*, etc., the branches, connecting with the feed pipes (not shown) leading to the several parts of the engine; *d*, *d'*, *d''*, etc., are hand wheels of the needle valves, indicated in dotted lines in Fig. 1, whereby the feed of the lubricant is governed; *e*, *e'*, *e''*, etc., are bulls' eyes, set in line with the discharge points (nozzles) of the needle valves, to render

visible the flow of the lubricant; *f* is a bull's-eye, serving in place of a gage, indicating the level of oil and water in the cup or container *a*; *g* the nipple for the filling port of the lubricator; *h* the condensing chamber, and *i* the steam pipe connecting therewith.

It is assumed, that the construction, and the mode of operation, of such an automatic lubricator is well known to all familiar with the art, and therefore, only a brief reference is made to those of its parts, which are not necessary to be directly considered in connection with my invention.

The oil-pipe *k*, extending to near the apex of cup *a* is screwed in collar *k'*, and this collar is, in turn, screwed in the end of the branch conduit *l*, connecting the cup *a* with the conduit *b*, from which branches *c*, *c'*, *c''*, etc., lead to the feed pipes. The lubricant (oil) filled in the cup is pressed by the water, entering the cup from the condensing chamber *h*, and flows into the oil-pipe *k* at its upper end. When the lubricator is in operative condition, the oil fills the oil-pipe *k* and conduit *b* rising in the branches *c*, *c'*, *c''*, etc., from where it passes, in a measured flow, through the orifices of the needle valves (indicated in dotted lines in Fig. 1) to the feed pipes.

The flow of the lubricant is governed by the hydrostatic pressure and by the needle valves, but its volume is limited not only by the area of the orifices of these valves, but also by the hydrostatic pressure, acting uniformly upon all branches of the lubricator. Now it happens quite frequently, that a larger supply of the lubricant than can normally be supplied by these means, is required in some part of the engine, and while this could, to some extent, be supplied by further opening the regulating valve, it is not always feasible and never prudent to do so, as thereby the adjustment of the lubricator would be disturbed, from which undesirable consequences may result. Therefore, to effect such a supplementary lubrication, without disturbing the adjustment of the lubricator, separate devices were used, heretofore, of which one, known as the "auxiliary oil cup," usually set upon the cup, or container *a*, of the lubricator, shown in the drawing, and connected by a conduit, called "the booster pipe," with the steam pipe *i*, and by another conduit with feed pipe, into which the additional supply of lubricant

is to be delivered, is most commonly employed, to enable the engineer to drive an additional supply of oil into one of the feed pipes, whenever such emergency arises.

5 This supplementary oiling device is usually provided only for the working cylinders of the engine, and is not available for any other part. The object of referring to this, and to similar devices, employed in connection
10 with automatic lubricators, is to show, that the necessity for some such auxiliary devices exists, and that in the absence of a better, more suitable and more efficient apparatus, users of lubricators resort to such
15 means, like the "auxiliary cup" and "booster pipe" to meet the essential requirement for supplementing its operation in such emergencies as often arise in the running of engines.

20 In devising my improvement of such lubricators, I provide a valve seat m in the upper end of the oil-pipe k , and a ball-valve n , held in operative position with the valve seat m , by the pin o , set transversely in the
25 oil-pipe. Then the hollow piston j , is fitted into the oil-pipe, in the upper end whereof a valve seat m' is provided, and a ball-valve n' , also held in operative position by pin o' . This piston extends through the
30 oil conduit b , and its stem j' , joined thereto at v , through the socket q , in a readily accessible position. On the end of stem j' , a handle r is set, and the journal of the stem is closed by the threaded cap t , containing
35 a packing u and serving as a stuffing-box to prevent leaking of oil through the bearing. A number of apertures s are provided in the piston j on the level of the conduit b , through which the oil flows from the cup
40 or container a at all times, that is, whether the device is operated, or not. The bore y of the socket q is larger in cross-sectional area than the outer diameter of the piston j , to permit discharging of the oil from the
45 piston j during its outward stroke.

When not used, the parts of the device are in the position shown in Fig. 2. The oil then flows, driven by the hydrostatic pressure, through the apertures in the valve
50 seats m and m' , into the piston j , and through the apertures s into the oil conduit b , and branches c , c' , c^2 , etc., as explained; the lubricator acting in every way as if the device were totally absent. When use is
55 made of the device, the piston j is operated by the handle r . A pull down draws out the piston, and a push up returns it again to the upper end. When the piston j is pulled down (out) the resistance of the oil
60 contained therein, sets the ball-valve n' into the seat m' , and an additional supply of oil is drawn in, from the cup a , into the oil-pipe at its upper terminus through the aperture in the seat m . Then upon the re-
65 versing of the motion of the piston j , valve

o closes the aperture in the seat m and the oil in the oil-pipe k is forced into the piston j , and through the apertures s into the conduit b and branches c , c' , c^2 , etc. Each following reciprocating motion of the piston
70 adds to the pressure upon the oil in conduit b , driving it at a greater velocity through the orifices of the needle-valves. The pumping operation is repeated as long as needed, but as a rule, two or three down and up
75 strokes of the piston j will be found sufficient to force an ample additional supply of lubricating oil into the feed pipes of the lubricator. If the additional supply of oil is to be delivered to one feed-pipe only, this
80 may be done by closing the valves of all others, or by a further opening of the valve of the one feed-pipe, into which a more abundant, additional supply of oil is to be driven. The hydrostatic pressure upon the
85 oil in cup a and the normal flow of oil are not disturbed by the operation of the forcing device, except, perhaps, momentarily, and the balance is quickly restored.

The described device for driving of lubricating oil into the feed pipes may be used
90 at the start, or after refilling the cup a , if too much, or all water should happen to be discharged, which ordinarily prevents the operation of the automatic lubricator, until
95 sufficient condensation accumulates, to restore the requisite pressure.

It happens sometimes, that the nozzle of one of the branches c , c' , c^2 , etc., becomes obstructed by a grain of some impurity, or by
100 a coagulated particle of oil. In such a case the only heretofore available remedy was to shut off the lubricator, unscrew the bonnet of the particular valve, remove it, and then to insert a wire into the obstructed passage,
105 to push out the obstruction. If the lubricator is provided with the herein shown and described improvement, such obstruction may be removed by producing additional pressure upon the oil in the conduit b by
110 merely reciprocating the piston j , in the same manner as above explained, or, if the obstruction should not yield, by temporarily shutting off the valve of the other feed pipes and thus concentrating the whole pressure
115 produced by the device upon the obstructed passage. This will, however, be seldom necessary to be done, practical use of my improvement having demonstrated, that the oil forcing device, constructed, as herein
120 shown and described, is capable of exerting sufficient pressure upon the oil to force such casual obstructions through the nozzles of the branches c , c' , c^2 , etc., even if two or more of them are clogged at the same time. 125

The bearing in the socket q is closed, as explained, by a stuffing-box, made up of the threaded cap t and packing ring u . To enable the cap t to be removed, and to replace
130 the packing u , without shutting off the lu-

bricator, the stop-collar *v* set at the joint of the piston *j* and its stem *j'*, is fitted into the seat *w*, at the end of the enlarged bore *y* in the socket *q*. Thus the collar *v* is made to
 5 act as a valve, closing the journal of the piston stem *j'*, when the piston is drawn to the end of its outward stroke. The piston *j* may be drawn out, the handle *r* and the cap *t*
 10 removed, the packing replaced, the cap again screwed on and the handle attached, without disturbing the normal operation of the lubricator. It is, perhaps, needless to
 15 add, that the herein shown and described device may equally well be combined with lubricators of other styles or constructions,
 20 besides the one illustrated in the drawing, and that no "auxiliary cup" and "booster pipe", or any other of the various "supplementary attachments" are required on a
 25 lubricator, when a device constructed as herein shown and described, is combined therewith.

I claim as my invention:—

1. The combination with a lubricator comprising an oil-cup or container for the lubricant, a feed conduit to where the lubricant is to be delivered, a pipe, extending into the oil-cup and communicating with the feed conduit and means for continuously driving the lubricant from the oil-cup through the
 30 pipe into the feed conduit; of a valve at the intake end of the pipe in the oil cup; a hollow piston fitted into the pipe; a valve in one end of the piston and a discharge port communicating with the feed conduit in the
 35 other end, and means for reciprocating the piston in the pipe, substantially as herein shown and described.

2. The combination with the oil-pipe and with the feed conduit of a lubricator, comprising also means for continuously driving the lubricant from the oil-cup of the lubri-

cator through the oil-pipe into the feed conduit, of a valve at the intake end of the oil-pipe, a hollow piston, fitted into the oil-pipe, a valve in the piston, and ports communicating with the feed conduit; and of means for reciprocating the piston, substantially as
 45 herein shown and described.

3. The combination, with a lubricator comprising an oil-cup, or container, for the lubricant, a feed conduit to where the lubricant is to be delivered, and means for continuously driving the lubricant from the oil-cup into the feed conduit, of a tube, having
 50 its intake end within the oil-cup or container and its delivery end in the oil feed conduit; a piston fitted into the tube; an inlet and a discharge valve in the piston, and means for operating the piston to draw the
 55 oil from the oil-cup into the feed conduit; substantially as herein shown and described.

4. The combination, with a lubricator, comprising an oil-cup, or container, for the lubricant, a feed conduit to where the lubricant is to be delivered, and means for continuously driving the lubricant from the oil-cup into the feed conduit; of a pump, set
 60 with its intake end within the oil-cup, and its delivery end in the feed conduit; and 70 adapted, when not used as a pump, to conduct the lubricant driven by the continuously driving means from the oil-cup into the feed conduit, and of means for operating the pump to draw the lubricant, independently of the continuously driving means,
 75 from the said oil-cup, to force it into the feed conduit, substantially as herein shown and described.

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Witnesses:

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