E. McCOY.

LUBRICATOR.

APPLICATION FILED JUNE 2, 1906.

1,109,775.

Patented Sept. 8, 1914.

3 SHEETS—SHEET 1.

Fig. 1.

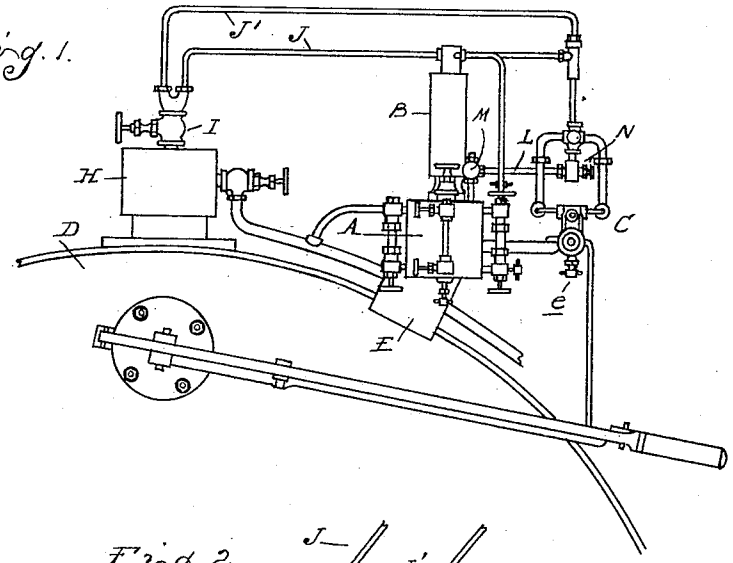
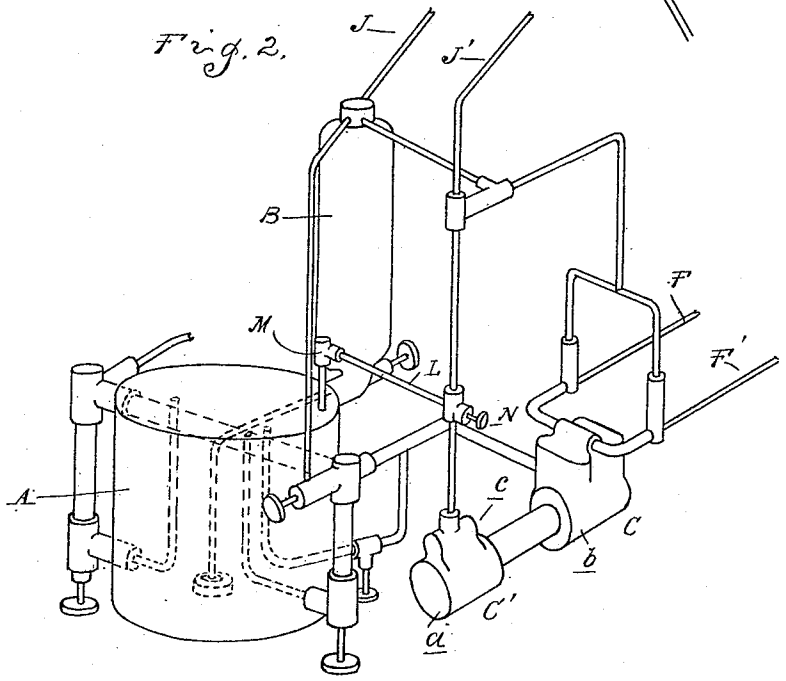


Fig. 2.



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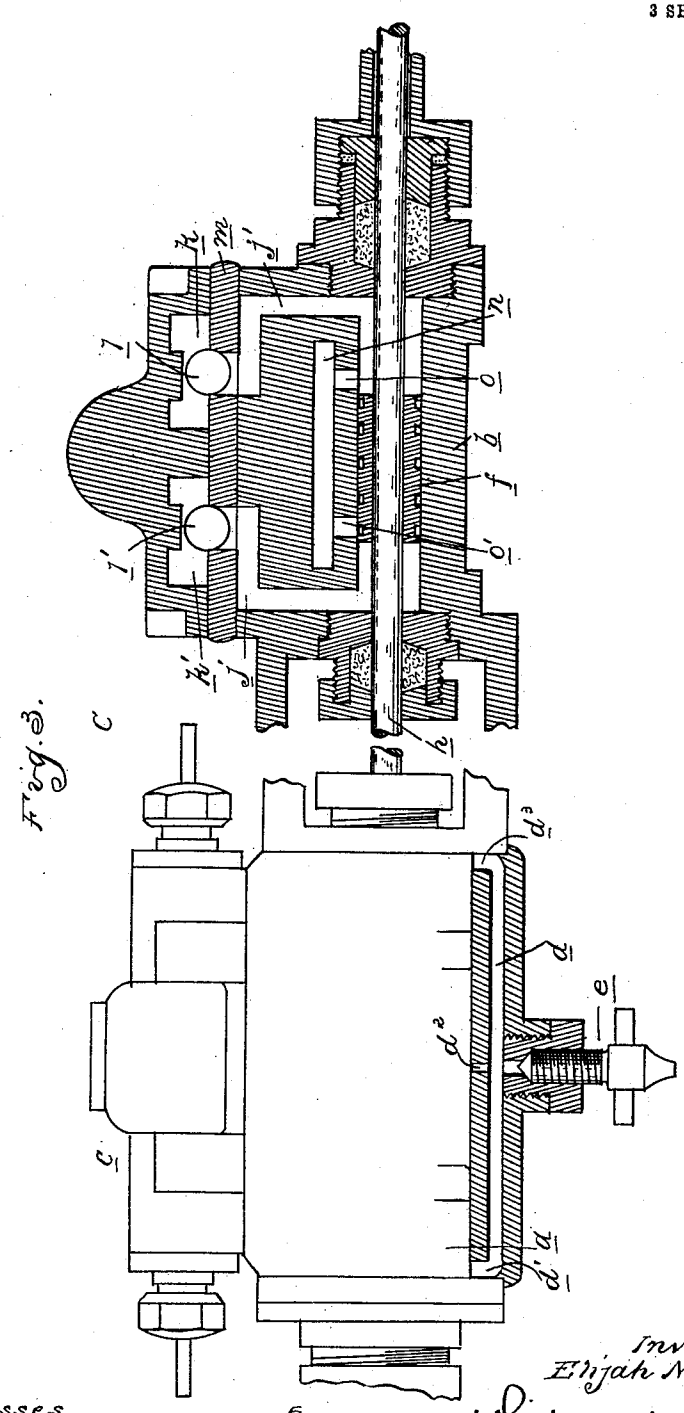


Fig. 3.

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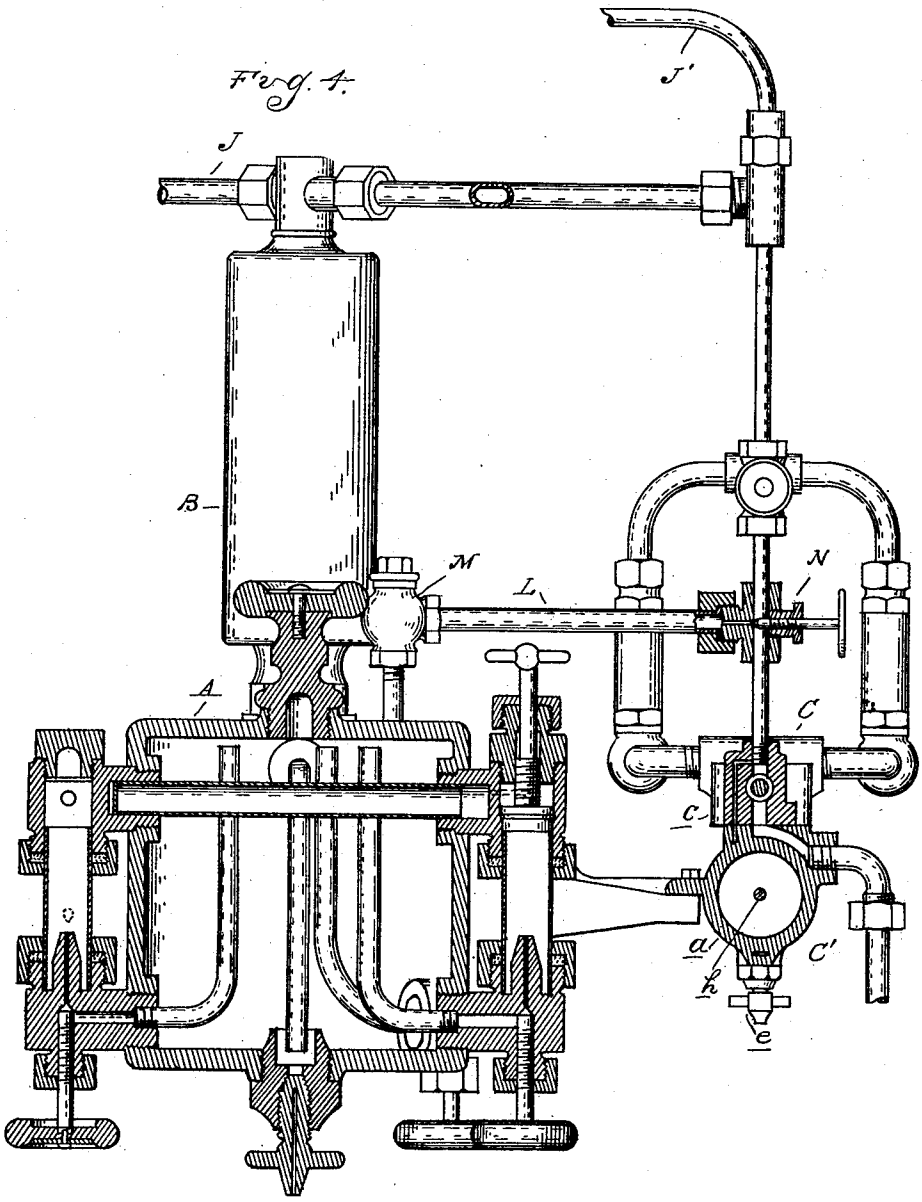
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3 SHEETS—SHEET 3.

Fig. 4.



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UNITED STATES PATENT OFFICE.

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LUBRICATOR.

1,109,775. Specification of Letters Patent. Patented Sept. 8, 1914.

Application filed June 2, 1906. Serial No. 319,843.

To all whom it may concern:

Be it known that I, ELIJAH McCOY, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Lubricators, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to lubricators of that type in which the oil is mechanically pumped to force it to the point of delivery.

The invention consists in the novel construction of the pumping mechanism, and further in certain features of construction as will be more fully hereinafter set forth.

In the drawings, Figure 1 is an elevation of the lubricator as applied to a locomotive; Fig. 2 is a perspective view thereof; Fig. 3 is a sectional side elevation of the pumping mechanism; and Fig. 4 is a cross section through the oil cup and pump.

My invention is applicable to lubricators for various uses, but, in the drawings, I have illustrated a construction particularly designed for use on locomotives, and which is constructed as follows:

A is an oil cup, B a condenser connected with said cup for feeding the oil therefrom by hydrostatic pressure, and C is a pump for receiving the oil from said cup and mechanically propelling it to the parts to be lubricated. These parts are preferably in fixed relation to each other, and are adapted to be secured to a locomotive boiler D in convenient position by suitable means, such as the bracket E.

F and F′ are the tallow pipes through which the oil is forced by the pump, and which lead to the cylinders of the locomotive.

The steam for supplying the condenser B, and for operating the pump C, is supplied from any suitable source, as for instance the steam box H on the locomotive to which all the various steam connections are usually attached.

I is a valve connected to the box H controlling the steam supply to two separate conduits J and J′, the one leading to the top of the condenser B, and the other connected to the steam cylinder of the pump C.

In addition to supplying oil to the cylinders of the locomotive, the lubricator is also provided with an attachment by which the cylinder of the operating pump C may also be lubricated.

The construction of the parts, and arrangements of connections, by which the oil is fed hydrostatically from the cup A to the pump, forms no part of the present invention, which relates more especially to the pump for mechanically feeding the oil.

As the maximum amount of oil to be fed to the locomotive cylinders by each stroke of the pump is comparatively small, it is difficult to make a mechanical construction which is of sufficiently limited capacity without making the parts smaller than is practicable. On the other hand, if the pump is of greater capacity than that required for the mechanical oil feed, it is difficult to produce a uniform feeding of the oil. This is for the reason that if the oil cylinder is not completely filled with oil, there is either a partial vacuum therein or some other medium, such as air or steam must fill the space unoccupied by the oil. Thus, when the oil is discharged from the cylinder it is accompanied by air or steam which interferes with the uniformity of the feed. In the present construction this difficulty has been avoided by reducing the capacity of the pump without diminishing the size of the mechanical parts, the construction being as follows: *a* is the steam cylinder and *b* the oil cylinder of the pump C. The steam cylinder *a* has attached thereto the valve cylinder *c* in which is a valve automatically shifted at the completion of each stroke of the piston in the steam cylinder by suitable connections not shown. The condensation collecting in the cylinder may be discharged through a drain cock, and as preferably constructed the lower portion of the cylinder is provided with a longitudinally extending drain passage *d* to which all of the various drain ports *d′* d^2 and d^3 are connected, and at the center of the cylinder is a single cock *e* controlling the discharge from this passage. The piston rod *h* extends from the cylinder *a* and has attached thereto within the cylinder *b* the oil pumping piston *f*. *j* and *j′* are passages leading from the opposite ends of the oil cylinder *b* to separate chambers *k′* and *k* to which the tallow pipes F and F′ are respectively connected. *l′* and *l* are valves between the passages *j* and *j′*

and chambers k' and k, these valves being seated in the partition m. The oil is supplied to the cylinder through a central passage n and this passage is connected by ports o and o' with the cylinder b. The ports o and o' are so positioned in the cylinder b and in relation to the piston f that the passage n will be in free communication with the interior of the cylinder during a portion of the travel of the piston. It is only when in the travel of the piston said ports are covered that the cylinder is disconnected from the passage n and during the remaining operation of the stroke of the piston the oil will be expelled from the cylinder through one of the passages j and j' and flow into one of the tallow pipes.

It is evident that by arranging the ports o and o' sufficiently near the end of the cylinder the pumping capacity may be diminished to any desired point, while during the interval, when the ports o and o' are opened, the oil is merely drawn into the cylinder from the passage n, and then returned again from the cylinder to said passage. Thus the cylinder, and all of the passages connecting therewith, remain constantly filled with oil, and the amount propelled by the pump, is only equal to the capacity of a portion of the cylinder.

For lubricating the cylinder a of the pump C, a conduit L is attached to the cup A, and a check valve M is arranged in this conduit.

N is a valve in the steam supply conduit J', to which the conduit L is attached, and which serves to admit oil from said conduit into the steam conduit. The check valve M prevents any possibility of the steam from the conduit L passing backward into the cup A.

It will be understood that in the operation of the pump during that period of the stroke of the piston in which both inlet ports o o' are opened the oil will be bypassed from one end of the cylinder to the other, while during the discharging portion of the stroke an equal quantity of oil will be drawn in to the opposite end of the cylinder.

What I claim as my invention is:

1. In a lubricator, a pump comprising a piston, a cylinder in which said piston reciprocates, having discharge passages connected to the opposite ends thereof and two intermediate inlet ports separated from each other by a distance substantially as great as the length of the piston and communicating with a common inlet passage whereby only that portion of the stroke of the piston beyond said inlet ports is effective in discharging the oil and during the preceding portion of the stroke the oil is bypassed from one end of the cylinder to the other.

2. In a lubricator, a pump comprising a piston, a cylinder having a discharge passage connected to opposite ends thereof and two intermediate inlet ports separated from each other by a distance substantially as great as the length of the piston, said ports being connected to a common valveless inlet passage and said piston having limits of travel beyond said inlet ports.

3. In a lubricator, a pump comprising a piston and a cylinder having discharge connections to the opposite ends thereof, outwardly opening check valves in said discharge connections, two intermediate inlet ports connected to a common inlet passage and separated from each other by a distance substantially as great as the length of the piston.

4. In a lubricator, a pump for feeding oil to the parts to be lubricated, comprising a piston, a cylinder having a discharge passage connected to opposite ends thereof, and two intermediate inlet ports connected to a common valveless passage.

In testimony whereof I affix my signature in presence of two witnesses.

ELIJAH McCOY.

Witnesses:
JAMES P. BARRY.
NELLIE KINSELLA.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."