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B. F. CAMPBELL & J. BERG.

LUBRICATING DEVICE.

APPLICATION FILED DEC. 2, 1902.

NO MODEL.

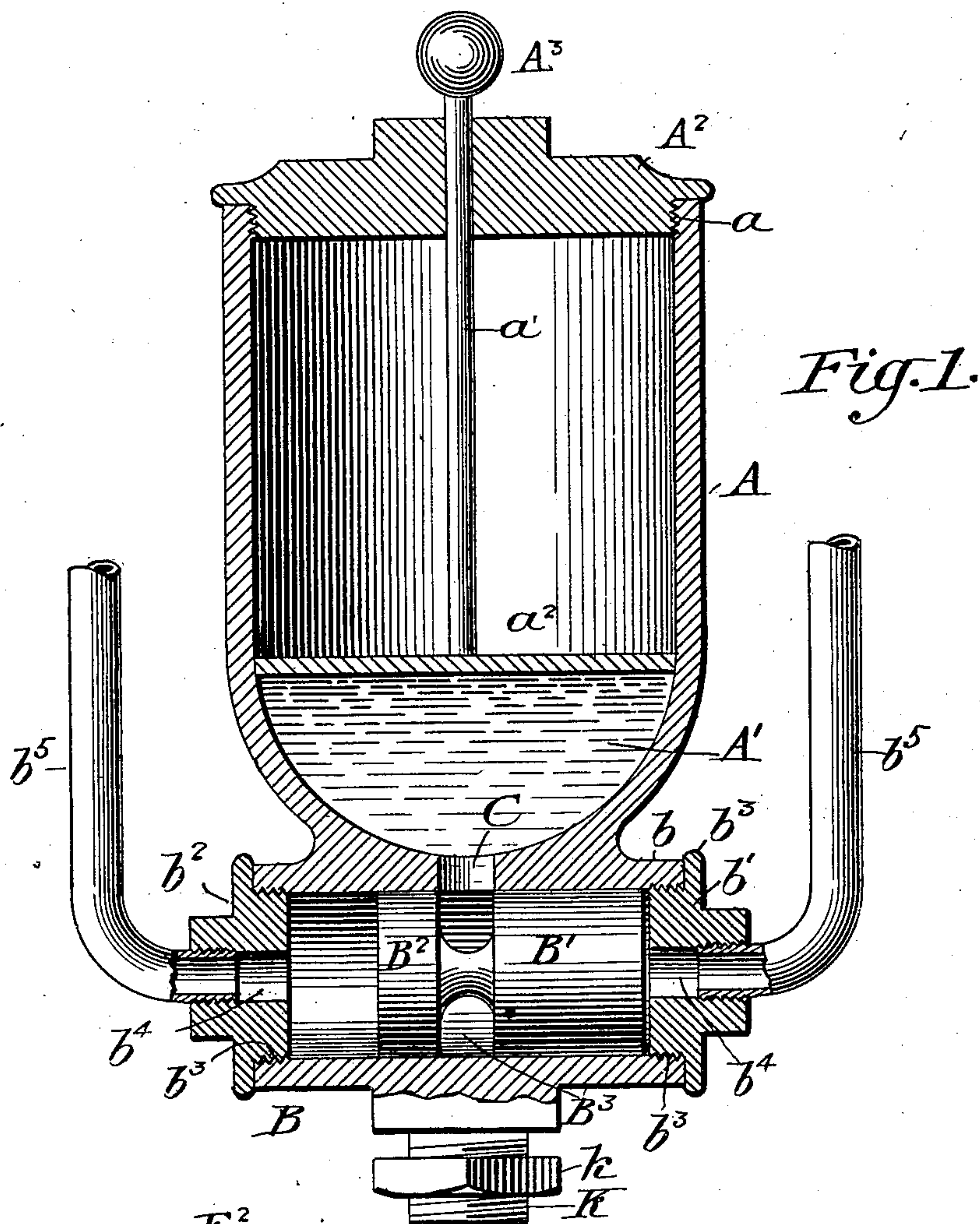


Fig. 1.

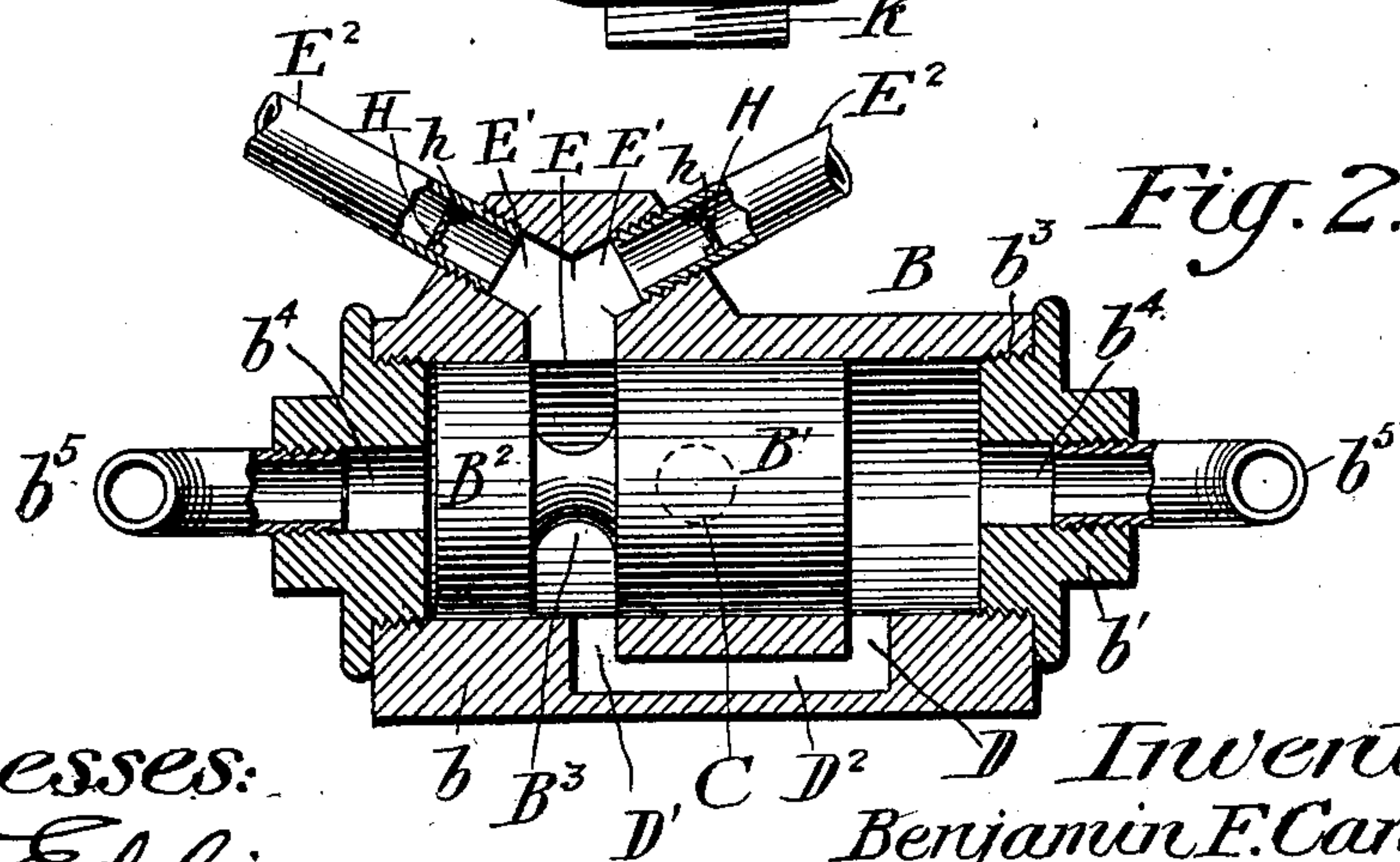


Fig. 2.

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UNITED STATES PATENT OFFICE.

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LUBRICATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 730,813, dated June 9, 1903.

Application filed December 2, 1902. Serial No. 133,802. (No model.)

To all whom it may concern:

Be it known that we, BENJAMIN F. CAMP-
BELL and JOSEPH BERG, residing in Little
Rock, county of Pulaski, and State of Ar-
kansas, have jointly invented certain new
and useful Improvements in Lubricating De-
vices, of which the following is a specifica-
tion.

The invention to be hereinafter described
relates to lubricating devices, and more par-
ticularly to that type of such devices wherein
graphite, oil, or other lubricant is fed to the
steam chests or cylinders of locomotive or
stationary engines by a forced feed, the ob-
ject of the invention being to provide a sim-
ple and effective device of this character
which may be operated at desired times to
force a desired quantity of lubricant to the
parts to be lubricated, all as will hereinafter
more fully appear; and the invention con-
sists of the parts and combinations as will be
fully described, and definitely pointed out in
the claims.

In the drawings, Figure 1 is a sectional view
of a cup or reservoir and the device for forc-
ing the lubricant to the parts to be lubri-
cated. Fig. 2 is a section of the feeding-cyl-
inder and connected parts in a plane at right
angles to the section of Fig. 1.

In the drawings, A represents a reservoir
or cup for holding a suitable lubricant A',
said reservoir having a cap or cover A², hav-
ing a screw-thread connection *a* with the walls
of the reservoir, although, as is evident, any
other means may be employed for joining the
cap or cover and reservoir. Extending cen-
trally through the cap or cover A² is the stem
a' of a telltale A³, having a float or disk *c*²,
adapted to rest upon the lubricant in the res-
ervoir, so that by the rise and fall of the tell-
tale the amount of lubricant in the reservoir
may be readily known at any time.

Disposed below the reservoir or cup A is
the feeding-cylinder, (designated as a whole
by B.) As shown in the present embodiment
of our invention, it will be noted that the
cylindrical wall *b* of the feeding-cylinder is
formed integral with or as part of the reser-
voir or cup A, although, as is evident, this
special formation is not necessary, and any
other arrangement of these parts may be em-

ployed. The ends of the feeding-cylinder B
are closed by end caps *b'* *b*², suitably con-
nected to the cylindrical wall, as by screw-
threads *b*³ or other means, and extending cen-
trally through the end caps are the openings
*b*⁴ *b*⁴, connected to the lead-pipes *b*⁵ *b*⁵, which
extend to any suitable source of pressure-
fluid supply—as, for instance, a compressed-
air tank or the like. In the case of a loco-
motive these lead-pipes will preferably extend
to the cab and there be controlled as to the
supply of air or pressure fluid thereto by the
ordinary three-way valve or cock—as, for in-
stance, shown in Patent No. 679,083. Since
this valve or cock for controlling the supply
of air or pressure fluid to the pipes *b*⁵ *b*⁵ in
alternation forms no part of my present in-
vention and is well known, it is not further
herein described.

Working within the feeding-cylinder B is
the chambered piston, free to move length-
wise in said cylinder and formed of heads B'
B², comprising between them the lubricant-
chamber B³. It will be evident from the con-
struction thus far described that the piston
thus formed may be quickly moved from one
to the other end of the cylinder by air or fluid
pressure being admitted and exhausted from
the opposite ends of the cylinder through the
lead-pipes *b*⁵ *b*⁵ and that the fluid-chamber
B³ will thus also be shifted to different points
in the length of the cylinder.

Centrally of the length of the cylinder B
and through the wall thereof is formed an
opening C, communicating with the reservoir
or cup A, and when the piston is in the posi-
tion indicated in Fig. 1 it is evident that the
lubricant in the reservoir or cup will under
the action of gravity flow through said open-
ing C and fill the lubricant-chamber B³ be-
tween the heads B' B² of the piston.

Formed in the wall of the cylinder B are
the ports D D', connected by a suitable pas-
sage D², one of said ports being formed near
one end of the cylinder and the other near
the opposite end thereof. It will be noticed
that the heads B' B² of the piston are of un-
equal lengths, the length of the head B' be-
ing substantially equal to the distance be-
tween the contiguous walls of the ports D D',
as shown in Fig. 2, so that when the piston

is in position shown in said Fig. 2 communication is had between the right-hand end of the cylinder B and the fluid-chamber B³ in the piston by means of the ports and passages and for a purpose as will hereinafter more fully appear.

Formed in the cylindrical wall of the cylinder B is an opening E, having branches E' E', which are connected with suitable pipes E² E², which lead directly to the steam-chest of the engine or, if desired, to the cylinder thereof. It will be noted that the opening E in the wall of the cylinder B is disposed near one end of the cylinder, while the opening C to the reservoir or cup A is centrally disposed in the length of said cylinder, and while this is the preferred arrangement it is to be understood that the essential feature of the invention in this respect is that the openings C and E shall be disposed in the length of the cylinder so that both shall not be in the same plane transverse of the cylinder.

From the construction thus described it will be apparent that in the normal position of the piston (shown in Fig. 1) the lubricant in the reservoir or cup A will by gravity fall into the lubricant-chamber B³ between the heads B' B² of the piston, and since the piston at this time is at the right-hand end of the cylinder the smaller head B² thereof closes the opening E, leading to the steam-chest or steam-cylinder of the engine, and also closes the port D', while the head B² closes the port D. Air or fluid pressure being admitted to the right-hand end of the cylinder through pipe b⁵, the piston will be moved to the left-hand end of the cylinder B, carrying with it the lubricant contained in the lubricant-chamber B³, and the heads B' B² will when the piston is at the left-hand end of the cylinder, as shown in Fig. 2, uncover the ports D D' and the opening E and will close the opening C from the reservoir or cup, thus establishing communication between the right-hand end of the cylinder B through the ports D D' and passage D², fluid-chamber B³, and opening E to the steam-chest or steam-cylinder of the engine, thereby forcing the lubricant contained in the said lubricant-chamber B³ to the parts to be lubricated, as will be evident. The lubricant having been thus forced by fluid-pressure from the lubricant-chamber B³ into the steam chest or cylinder, pressure is applied through the left-hand pipe b⁵ to the left-hand end of the piston, thereby forcing it to the opposite or right-hand end of the cylinder, such movement of the piston thereby closing the opening E and port D' by means of the smaller head B² of the piston and also closing port D by the larger head B' of the piston and opening communication between the reservoir A and the lubricant-chamber B³ through the opening C.

It will be noted that the heads of the piston are of unequal size and that they serve not only the purpose of taking the pressure of the fluid from the pipes b⁵ b⁵ to move the pis-

ton lengthwise of the cylinder, but also to effect the opening and closing of the ports and passage-ways, so that lubricant having been admitted to the lubricant-chamber B³ the said chamber is brought into communication with the openings to the steam-chest or steam-cylinder, and simultaneously therewith the fluid-pressure at the right-hand end of the cylinder is permitted to act through the ports and passage-ways D D' D² to force the lubricant to the parts to be lubricated.

It is desirable in this form of device also that a check-valve be placed in each of the pipes E² E², leading to the steam-chest or steam-cylinder, said check-valves opening to the admission of the lubricant under the pressure of its actuating fluid from the cylinder B and closing automatically under the back pressure of the steam from the steam-chest or steam-cylinder. In the drawings in Fig. 2 we have indicated one form of check-valve, as H H, which may be hinged at h to one side of the pipes E² E². It will be evident, of course, that any preferred form of check-valve may be used for this purpose, and we do not regard our invention as in any way limited in this respect.

As one form of means for securing the reservoir or cup A and its connected parts in suitable relation with the steam-chest or steam-cylinder or other mechanism to be lubricated there is in Fig. 1 shown a screw-stem K, extended from the cylinder B, having a nut k for securing the device in position.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a lubricating device, the combination of a lubricant-reservoir, a feeding-cylinder having communication therewith, a piston freely movable in said cylinder and having a lubricant-chamber, said cylinder being provided with ports, and passages connecting the opposite end portions of the cylinder and having an opening for the feed of the lubricant to the part to be lubricated, and means for conducting air or fluid pressure into the opposite ends of said cylinder.

2. In a lubricating device, the combination of a lubricant reservoir or cup, a feeding-cylinder disposed below said reservoir or cup and having communication therewith, a piston having a lubricant-chamber and freely movable within said cylinder, said cylinder being provided with ports and passages connecting the different portions of said cylinder, an opening near one end of said cylinder, pipes leading from said opening to the parts to be lubricated, and means for conducting air or fluid pressure into the opposite ends of the cylinder.

3. In a lubricating device, the combination of a lubricant reservoir or cup, a feeding-cylinder disposed below said reservoir or cup and having communication therewith, a piston freely movable lengthwise in said cylinder and provided with a lubricant-chamber

into which the lubricant may fall by gravity when the piston is at one end of its stroke, said cylinder being provided with ports and passages connecting the end portions of said cylinder, said cylinder being also provided with an opening near the end portion thereof opposite one of the said ports, and means for conducting air or fluid pressure into the opposite ends of said cylinder to move said piston to thereby carry the lubricating-chamber of the piston and its contained lubricant into register with the said opening in the cylinder and to uncover the ports and passages to permit the air or fluid pressure to act upon the lubricant in the lubricating-chamber and force it through said opening to the parts to be lubricated and then return the piston to the opposite end of the cylinder.

4. In a lubricating device, the combination of a lubricant reservoir or cup, a feeding-cylinder disposed below said reservoir or cup and having an opening in the wall thereof centrally disposed with relation to the length of said cylinder, a piston having heads of unequal lengths and an oil-chamber between the same, said piston being freely movable within said cylinder, said cylinder having ports and passages connecting the opposite end portions thereof, and also having an opening opposite one of said ports in communication with the parts to be lubricated, said opening being disposed near one end of the cylinder, and means for conducting air or fluid pressure into the opposite ends of said cylinder to move the piston.

5. In a lubricating device, the combination of a lubricant reservoir or cup, a feeding-cylinder disposed below said reservoir or cup, a piston having heads of different lengths containing between them a lubricant-reservoir, said piston being freely movable in said cylinder, the wall of said cylinder being provided with an opening leading to the reservoir or cup which when the cylinder is at one end of its stroke is in communication with the lubricant-chamber, said cylinder being provided with ports and passages connecting

the opposite end portions of the cylinder, said cylinder being also provided with an opening disposed near one end thereof in communication with the parts to be lubricated, pipes for conducting air or fluid pressure at opposite ends of said cylinder to thereby move said piston to establish communication between said air or fluid pressure in one end of the cylinder through the lubricant-chamber and opening leading to the parts to be lubricated and return said piston to close said communication, substantially as described.

6. The combination of a reservoir or cup, a feeding-cylinder disposed below the same, a piston having a lubricating-chamber adapted to receive lubricant from the reservoir or cup under the action of gravity when the piston is at one end of its stroke, means for conducting air or fluid pressure at the opposite ends of said piston, said cylinder having ports and passages and an opening leading to the parts to be lubricated, said ports and opening being closed by the piston when at one end of its stroke and opened into communication with the air or fluid pressure that moves the piston when the piston is at the opposite end of its stroke to thereby force the lubricant from the reservoir-chamber to the parts to be lubricated.

7. In a lubricating device, the combination of a reservoir or cup, a cylinder disposed below said reservoir or cup, a piston having a lubricant-chamber adapted to be in communication with said reservoir or cup when the piston is at one end of its stroke, said cylinder being provided with ports and passages connecting the opposite end portions of said cylinder, said cylinder having an opening in the wall thereof near one end, pipes leading to the parts to be lubricated and check-valves disposed within said pipes.

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