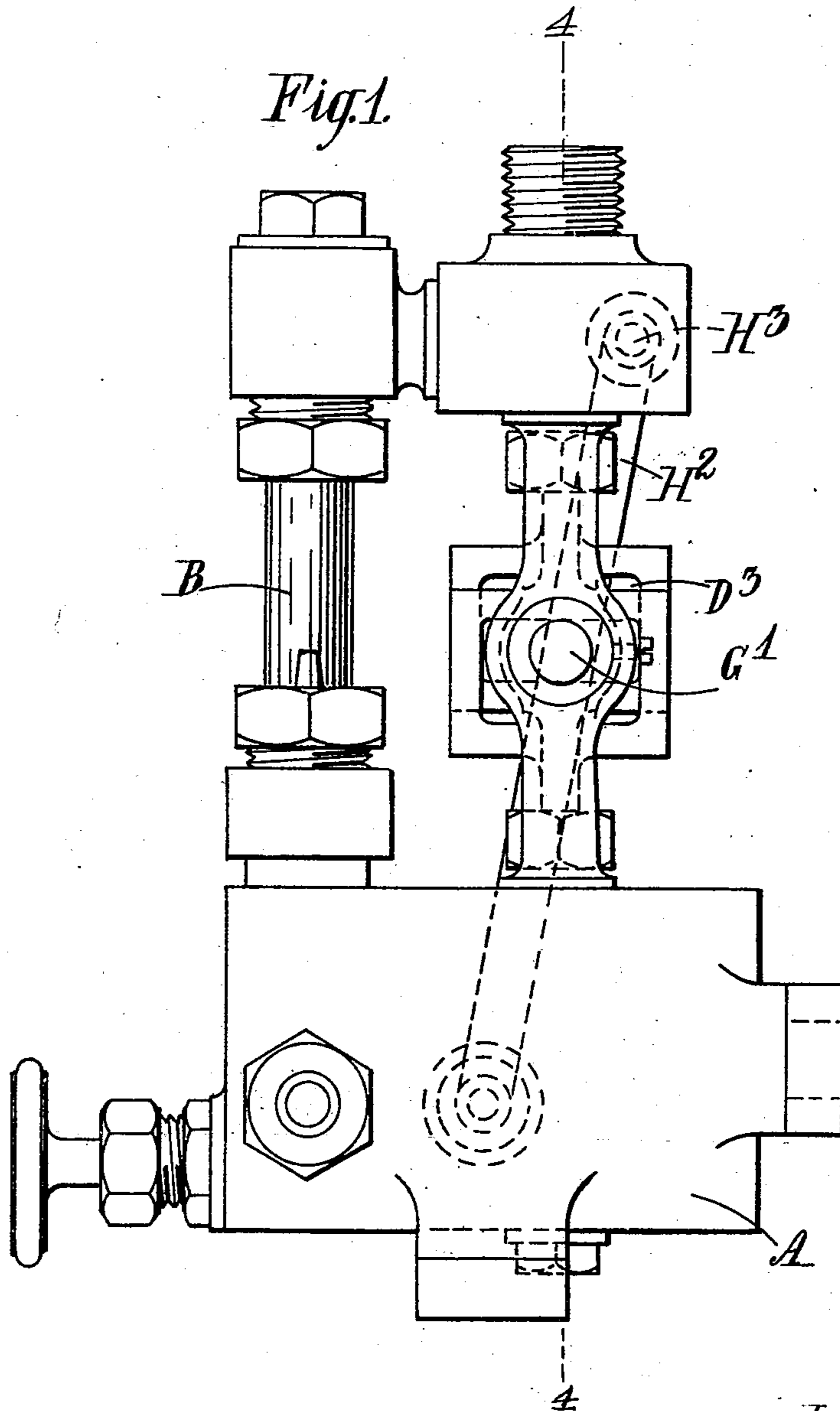


C. C. WAKEFIELD.
FORCE FEED LUBRICATOR.
APPLICATION FILED OCT. 17, 1907.

912,337.

Patented Feb. 16, 1909.

4 SHEETS—SHEET 1.



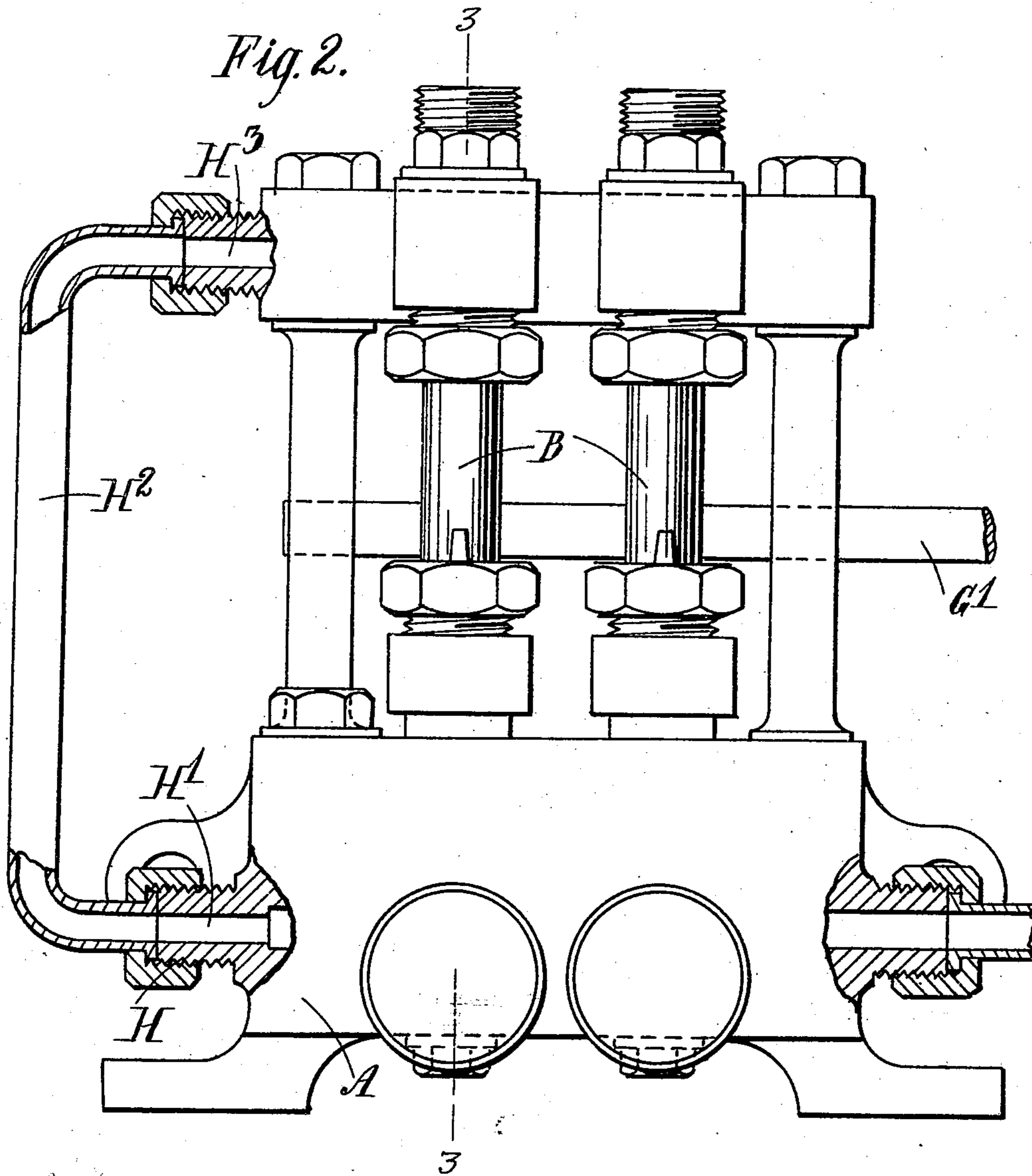
Witnesses:
Melville D. Church
Elizabeth Gifford

Inventor:
Charles C. Wakefield,
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his Attys

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Witnesses:

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Inventor:

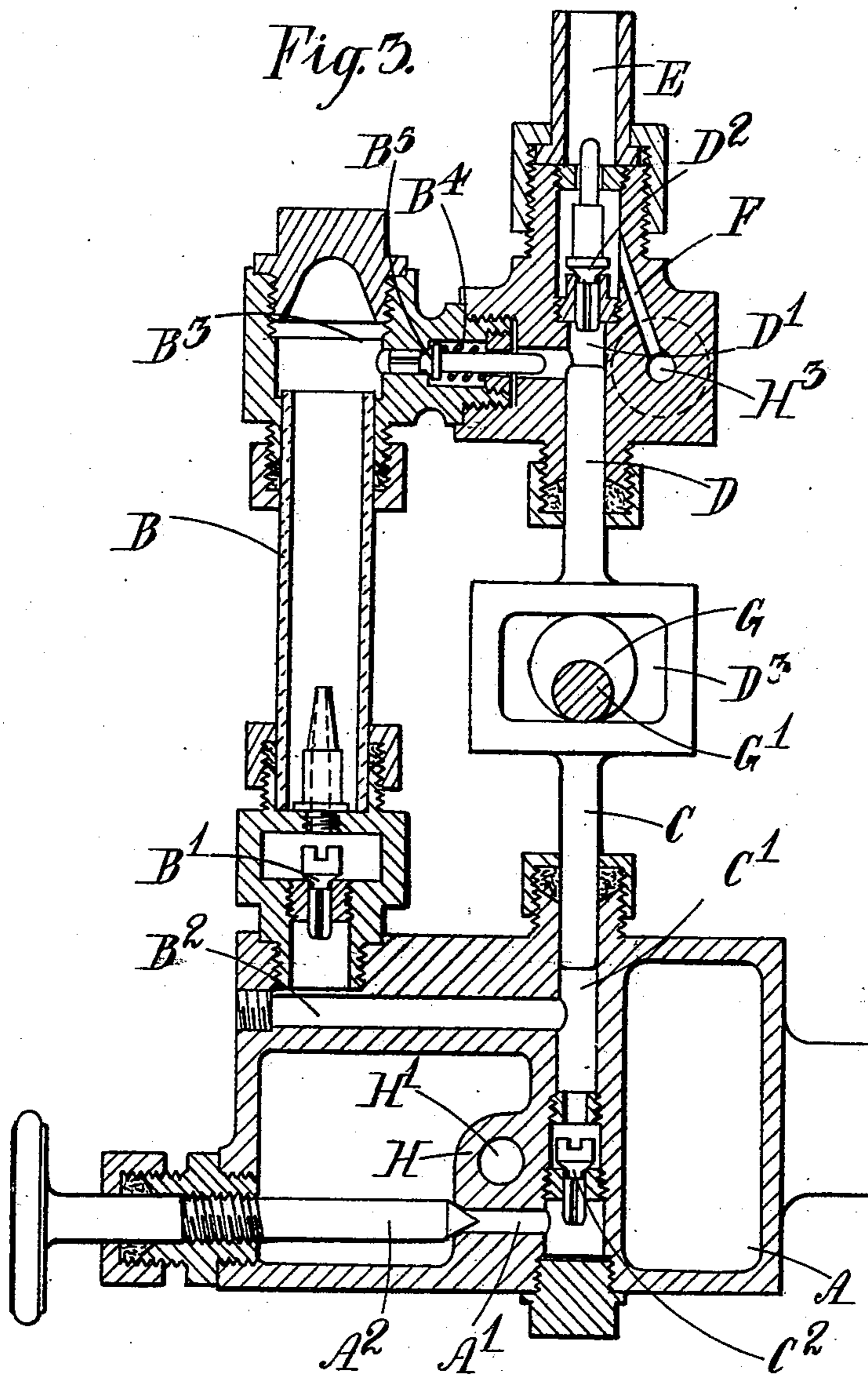
Charles C. Wakefield
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4 SHEETS—SHEET 3.



Witnesses:
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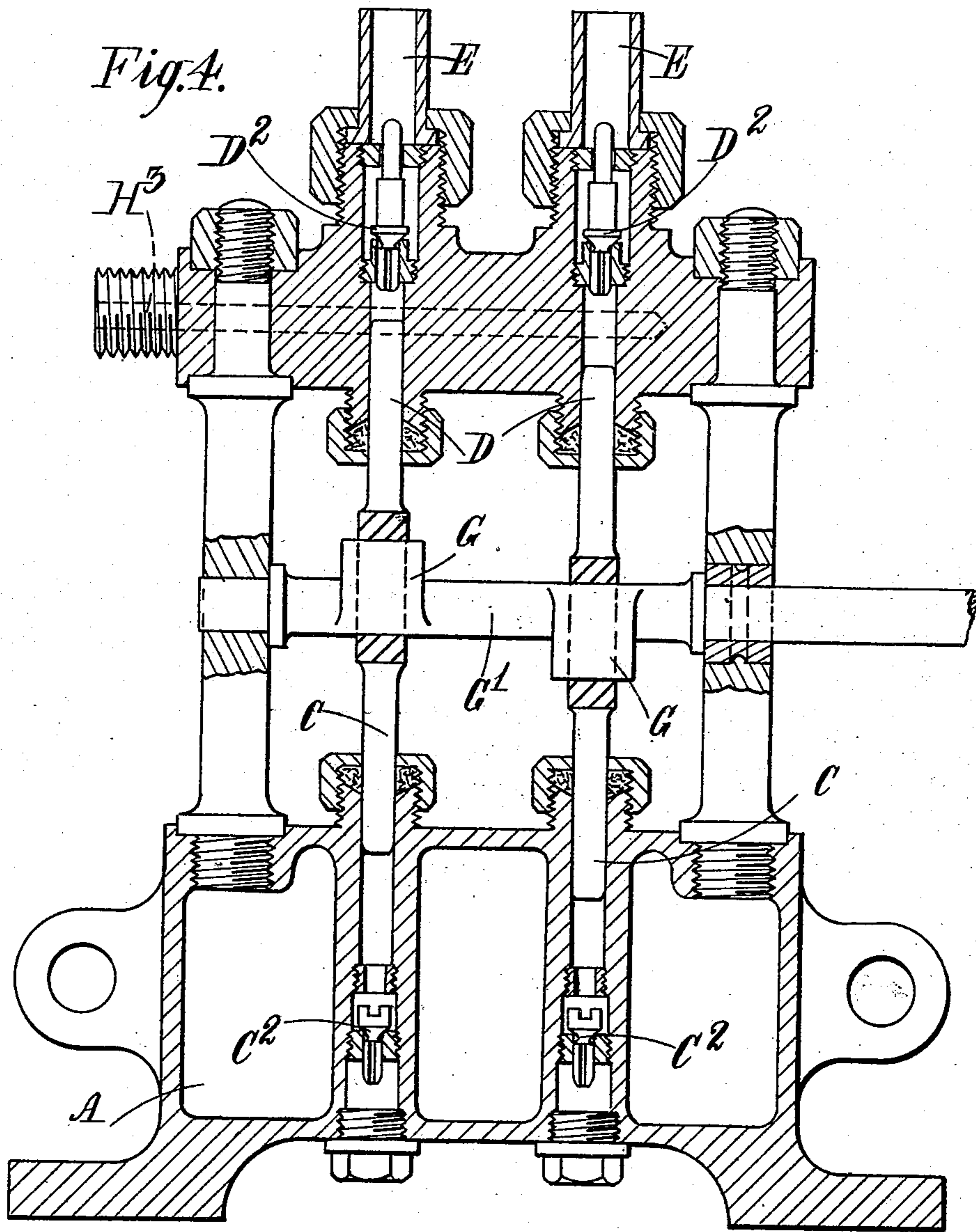
Charles C. Wakefield

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4 SHEETS—SHEET 4.



Witnesses
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By

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UNITED STATES PATENT OFFICE.

CHARLES CHEERS WAKEFIELD, OF LONDON, ENGLAND.

FORCE-FEED LUBRICATOR.

No. 912,337.

Specification of Letters Patent.

Patented Feb. 16, 1909.

Application filed October 17, 1907. Serial No. 397,883.

To all whom it may concern:

Be it known that I, CHARLES CHEERS WAKEFIELD, a subject of the King of Great Britain, and residing at London, England, have invented certain new and useful Improvements in Force-Feed Lubricators, of which the following is a specification.

This invention is for improvements in force-feed lubricators of the sight-feed type, and has for its object to provide a lubricator wherein the lubricant after having passed the sight-feed portion of the apparatus may be positively driven forward towards the part to be lubricated.

In carrying out this invention mechanism is provided between the sight-feed device and the part to be lubricated, whereby the lubricant, after passing the sight-feed, may be positively advanced towards the part to be lubricated.

A further feature of this invention consists in providing means whereby back-pressure on the sight-feed device may be prevented, in order that the lubricant may be passed into a steam pipe or other part under pressure without such pressure being communicated to the sight-feed. The apparatus for passing the lubricant on from the sight-feed to the part to be lubricated conveniently takes the form of a plunger-operated pump situated between the sight-feed, (which may comprise a liquid-containing transparent tube), and the part to be lubricated, so that the valves of the pump serve to prevent back-pressure on the sight-feed.

The lubricant may be fed to the tube by a second pump and when so arranged the pumps are so connected that while one is performing its in-take stroke, the other is performing its discharge stroke.

In the accompanying drawings which illustrate one method of carrying out this invention, Figure 1 is a side elevation of the lubricator, Fig. 2 is a front elevation of the same in part section, Fig. 3 is a vertical section on the line 3—3 of Fig. 2, and Fig. 4 is a vertical section on the line 4—4 of Fig. 1.

The base A of the lubricator is made to constitute an oil-reservoir and carries a series of sight-feed tubes B. These are of glass and are filled with water in the well known manner so that the lubricant entering the bottom of the tubes can be seen passing through the water therein to the top of the same. At the base of each tube is a non-return valve B¹ which controls a conduit B²

that communicates with the reservoir A by way of conduit C¹ A¹. The conduit C¹ constitutes a pump barrel wherein slides a plunger C and a non-return valve C² controls the admission of lubricant from the reservoir A by the conduit A¹ to the barrel C¹. The flow of lubricant from the reservoir to the conduit A¹ may be regulated by an adjustable valve A² which extends through the wall of the reservoir so that it may be operated by hand from without the same.

The upper end B³ of the sight-feed tube communicates, by way of a conduit B⁴ and a non-return valve B⁵, with a conduit D¹ that constitutes a second pump barrel wherein slides a plunger D. This conduit D¹ has communication with a conduit E, and a non-return valve D² permits passage of the lubricant into the conduit E but prevents return of the same to the conduit D¹. That end of the conduit E remote from the valve D² communicates with the part to be lubricated and may be connected to one of the steam-supply pipes or to the steam-chest of the engine with which the lubricator may be employed. Where steam is available, a small jet of steam may be admitted to the pipe E in proximity to the valve D² for the purpose of aiding the passage of the lubricant to the part to be lubricated. For this purpose a small conduit F is shown, one end of which enters the conduit E while its other end may communicate direct with the boiler.

The pump plungers C D are disposed approximately parallel to the sight-feed tube B and are made integral so that a single eccentric G working in a slot D³ formed in the plungers may serve to operate both plungers. The eccentric is carried by a shaft G¹ which may be driven by any suitable mechanism.

The operation of this lubricator is as follows—When the eccentric G is rotated the plungers C and D will be constantly reciprocated, and they are so arranged that when the plunger C is performing its in-take stroke, the plunger D will be performing its discharge stroke. In the drawing the plunger D has just completed its discharge stroke, and the plunger C has sucked in a charge of lubricant from the reservoir A past the valves A² C². Further movement of the eccentric will now cause the plunger C to descend, whereupon the valve C² will close against the pressure thus put upon the lubricant in the barrel C¹, and the lubricant will

be advanced through the conduit B^2 past the valve B^1 into the sight-feed tube B . During this operation, however, the plunger D has simultaneously been performing its in-take stroke, so that lubricant from the upper portion B^3 of the sight-feed tube has been admitted past the valve B^5 through the conduit B^4 into the pump-barrel D^1 . It will thus be seen that no pressure is exerted upon the tube B by forcing lubricant into it, as the plungers may be of the same cross-sectional area in order that the amount of lubricant withdrawn may equal that forced into the tube. During the in-take stroke of the plunger D the valve D^2 remains closed, whereby back-pressure from the conduit E on to the tube B is prevented irrespective of the presence of the valve B^5 . At the next reciprocation of the double plunger C D lubricant is again drawn into the pump barrel C^1 while that admitted to the barrel D^1 is now forced forward past the valve D^2 into the conduit E . During the discharge stroke of the plunger D , the valve B^5 remains closed, so that no back-pressure due to the operation of the pump is brought to bear upon the tube B . It will thus be seen that by this device the lubricant is fed by positive means to the sight-feed tube, and then passed on thence by positive means towards the part to be lubricated without subjecting the tube to any pressure even though the plunger D may be employed to advance the lubricant into a steam conduit or other part under steam pressure.

The conduit F admits steam from the boiler as has been already described for the purpose of aiding the passage of the lubricant to the part to be lubricated after it has passed the valve D^2 , and the steam in its passage to this conduit may be led through passages cored in the body of the lubricator for the purpose of raising the temperature of the lubricant should this be desired.

The lower pump barrels C^1 are formed in vertically disposed cores that may be cast within the reservoir A , but they allow free passage of the lubricant around them so that the whole of the chamber A is available as a reservoir. Across the base of these barrels is a horizontal web H through which a passage H^1 is formed. This passage communicates at one end with the steam-supply pipe from the boiler and at the other end it is connected by a conduit H^2 to a horizontal passage H^3 provided in the upper portion or head of the lubricator. This passage lies at the rear of the pump-barrels D^1 , and from it extend the conduits F which communicate with the conduits E already referred to. It will thus be seen that the steam on its way to the conduits F is utilized by this means to raise the temperature of the lubricant so that it may be always maintained in a sufficiently fluid condition to pass freely through the lubricator.

In the drawings a two-tube lubricator is shown, but obviously the invention is not restricted to a two-tube device. The valves A^2 in addition to regulating the flow of lubricant, enable any one tube to be thrown out of action without stopping the operation of the shaft G^1 .

What I claim as my invention and desire to secure by Letters Patent is—

1. In a lubricator the combination of, a sight-feed chamber containing liquid whose specific gravity is greater than that of the lubricant, means for positively feeding lubricant into the sight-feed chamber at one end, means for simultaneously withdrawing an equal quantity of lubricant from the other end of the same for the purpose of positively feeding lubricant through the sight-feed chamber without subjecting the chamber to pressure, means for conducting the lubricant from the sight-feed chamber to the part to be lubricated, and means for relieving the chamber from back pressure, substantially as set forth.

2. In a lubricator the combination of, a sight-feed chamber containing liquid whose specific gravity is greater than that of oil, a reservoir for lubricant means for drawing a given quantity of lubricant from the reservoir and positively feeding it into the sight-feed chamber at one end, means for simultaneously withdrawing an equal quantity of lubricant from the other end of the same for the purpose of positively feeding lubricant through the sight-feed chamber without subjecting the chamber to pressure, means for conducting the lubricant from the sight feed chamber to the part to be lubricated, and means for relieving the chamber from back pressure, substantially as set forth.

3. In a lubricator the combination of, a sight feed chamber containing a liquid whose specific gravity is greater than that of the lubricant, a plunger-operated force pump for feeding lubricant to one end of the sight-feed chamber, a plunger-operated pump to receive the lubricant from the other end of the chamber and to force it forward against fluid pressure to the part to be lubricated, the inlet and discharge valves of this pump serving to prevent back-pressure on to the sight-feed chamber, and means for operating the pumps in such manner that one performs its intake stroke while the other is performing its discharge stroke, substantially as set forth.

4. In a lubricator the combination of, a sight-feed tube containing a liquid whose specific gravity is greater than that of the lubricant, a force pump for feeding lubricant to the base of this tube and having a reciprocating plunger disposed approximately parallel with the tube, a second force pump for receiving the lubricant from the upper end of the tube and forcing it towards the part to be

lubricated this pump having a plunger that
is made integral with that of the other pump
and also lies approximately parallel to the
tube, and an eccentric disposed to operate in a
5 slot provided therefor in the double plunger
whereby the plunger is reciprocated in such
manner that the one pump performs its in-
take stroke while the other performs its dis-
charge stroke the valves of the upper pump

also serving to prevent back-pressure on to 10
the sight-tube substantially as set forth.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

CHARLES CHEERS WAKEFIELD.

Witnesses:

H. D. JAMESON,

A. NUTTING.