

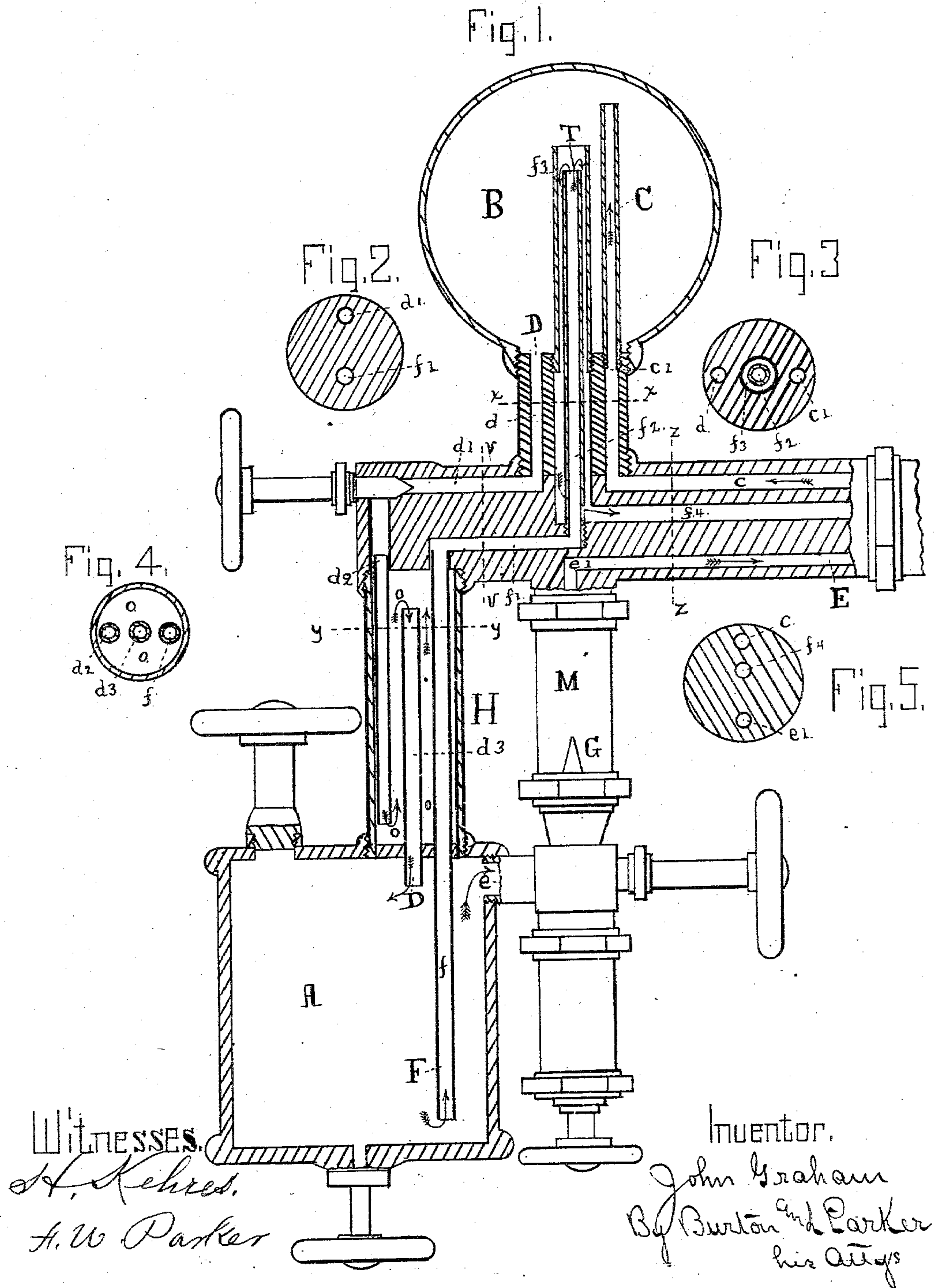
(No Model.)

J. GRAHAM.

LUBRICATOR.

No. 283,481.

Patented Aug. 21, 1883.





# UNITED STATES PATENT OFFICE.

JOHN GRAHAM, OF CHICAGO, ILLINOIS.

## LUBRICATOR.

SPECIFICATION forming part of Letters Patent No. 283,481, dated August 21, 1883.

Application filed May 21, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN GRAHAM, a citizen of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lubricators for Steam-Cylinders, of which the following specification contains a full and true description, sufficient to enable any one familiar with the art to which the same pertains to make and use the same.

My invention is designed to be applied to lubricators of the class which feed oil by displacing it from its containing-reservoir by water of condensation discharged into it from a condenser. In such lubricators it is a common occurrence that the condensation is more rapid than necessary to feed the proper quantity of oil, and an escape must be provided for the surplus quantity of water. This escape it has been usual to provide by a conduit leading directly from the condensing-chamber back to the steam-pipe, the educt from the condenser being at a point which is to be the limit of height to which the water of condensation shall accumulate. A second desideratum in such lubricators is to maintain the oil in the oil-reservoir at a temperature as high as possible without vaporizing it, to the end that it may be sufficiently fluid to pass readily through the necessarily small opening which leads it to the parts to be lubricated. In exposed positions in cold weather this necessity is absolute, and a "cold cup" will not work at all. In my invention advantage is taken of the first-mentioned circumstance—viz., surplus condensation—to meet the second need.

In the common construction of all lubricators of this class the water which displaces the oil remains in the oil-reservoir without change until complete displacement has taken place and the reservoir is emptied of oil and filled with water. The surplus water of condensation, being that which condenses after the accumulation in the condenser has reached the height of the overflow-opening, is the last condensed, and hence the hottest, and remains on the top of the water in the condenser until it flows off through the overflow back to the steam-pipe. The water for displacement, being taken from the bottom of the condenser, is the coolest water in the condenser, and becomes still cooler after it passes into the oil-res-

ervoir. My construction is such as to pass all the water which is condensed in the condenser through the oil-reservoir, and to carry away the surplus water, if any, by taking the cooled water from the bottom of the oil-reservoir. This I effect by dispensing entirely with the usual overflow from the condenser, and providing instead a conduit leading from the lower part of the oil-reservoir, first, to a point as high as it is desired to allow the water of condensation to accumulate in the condenser and thence back to the steam-pipe. From this construction it will result that no water will pass out through the surplus-water pipe until the water has accumulated in the condenser to the height of the highest point of the surplus-water pipe, and that all surplus condensation after that point is reached will pass down into the oil-reservoir, thereby causing a discharge from the surplus-water pipe back into the steam-pipe; and, since the water in the former is derived from the bottom of the oil-reservoir, it will be the cooled water, while that which replaces it in the reservoir, being that last condensed, will be the hottest which the instrument is capable of affording.

In the annexed drawings I have shown the improvement applied to a form of lubricator described in patent to me dated November 1, 1881, No. 248,927; but it is equally applicable to any lubricator of the class indicated at the beginning of the above description.

Figure 1 is a view of my lubricator, in which the parts necessary to show the working of my improvement are shown in vertical section. Figs. 2, 3, 4, and 5 are horizontal sections of the several connecting-necks of the lubricator, made, respectively, at the lines V V, X X, Y Y, and Z Z.

A is the oil-reservoir. B is the condenser. C is the steam-induct. D is the water-passage from the condenser to the oil-reservoir. E is the oil-passage from the oil-reservoir to the steam-pipe. F is the surplus-water pipe which constitutes my invention.

For more particular description it may be noticed that the steam-induct C consists of the horizontal part C and the vertical part C'; that the water-passage D consists of the vertical descending part  $d$ , the horizontal part  $d'$ , the further vertical descending part  $d''$ , the further vertical ascending part afforded by the



space O in the neck H, and the further and final descending part  $d^3$ , the arrangement of the part  $d^2$ , the space O, and the part  $d^3$  being such as to constitute a trap against the upward passage of the oil; that the oil-passage E consists of the horizontal part  $e$ , the nozzle G, the visible feed-tube M, and the further upward and outward passage  $e'$ ; that the surplus-water pipe F consists of the upward-extending part  $f$ , the horizontal part  $f'$ , the further upward part  $f^2$ , the downward part formed by the annular space within the tube  $f^3$ , about the upward part  $f^2$ , and the final outward horizontal part  $f^4$ . The educt-opening of the surplus-water pipe F is near the bottom of the oil-reservoir A. Its highest point T is the maximum height to which water is desired to accumulate in the condenser, and its discharge into the steam-pipe may be at any point not higher than the point T. Its descending from the point T to the steam-pipe is merely a convenience of structure in the particular form of lubricator in connection with which it is here shown.

For the sake of compactness in this form of lubricator I prefer to make the surplus-water pipe by interior passages, as shown in the drawings; but it may be made by exterior pipes, and any mechanic can, without special instructions, make such adaptation. In either case this passage should be exposed to the steam-pressure at the point T to prevent siphoning, and should be controlled by a valve at any convenient point. In the drawings it is shown in dotted outline P, being behind the lubricator in the position in which the view in the figure is taken. This valve should be closed while the cup is being filled with oil. It may also be necessary to regulate the outflow of water through the surplus-water pipe by means of this valve, which should be kept only just sufficiently open to allow the escape of the actual amount of surplus condensation.

If the passage F is made outside, and with any portion descending from the highest point T to the steam-pipe, such descending portion should be made considerably larger than the ascending part, so as to permit the access of steam alongside of the descending water to the point T.

The particular mechanical structure which I find convenient will be readily understood from the drawings, and not being strictly material to my invention need not be further explained.

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

1. In a lubricator which feeds oil by displacing it from its reservoir by water derived from a condenser, the combination, with such oil-reservoir, condenser, and their connecting passages, of a duct leading from the lower part of the oil-reservoir and terminating in the steam-pipe, and having its highest point at the level of the surface of the liquid column by whose pressure the oil is fed.

2. In a displacement feed-lubricator, the method of disposing of the surplus water of condensation, which consists in forcing the water from the bottom of the oil-reservoir up to the maximum height of the feeding-column by means of the pressure of that column, and draining it thence to the steam-pipe.

3. In a displacement feed-lubricator, the method of keeping the oil warm, which consists in maintaining a current of freshly-condensed water from the condenser through the oil-reservoir to the steam-pipe.

In testimony that I claim the foregoing as my invention I have hereunto set my hand, in the presence of two witnesses, at Chicago, this 28th day of April, 1883.

JOHN GRAHAM.

Attest:

CHAS. S. BURTON,  
L. C. RIGGS.