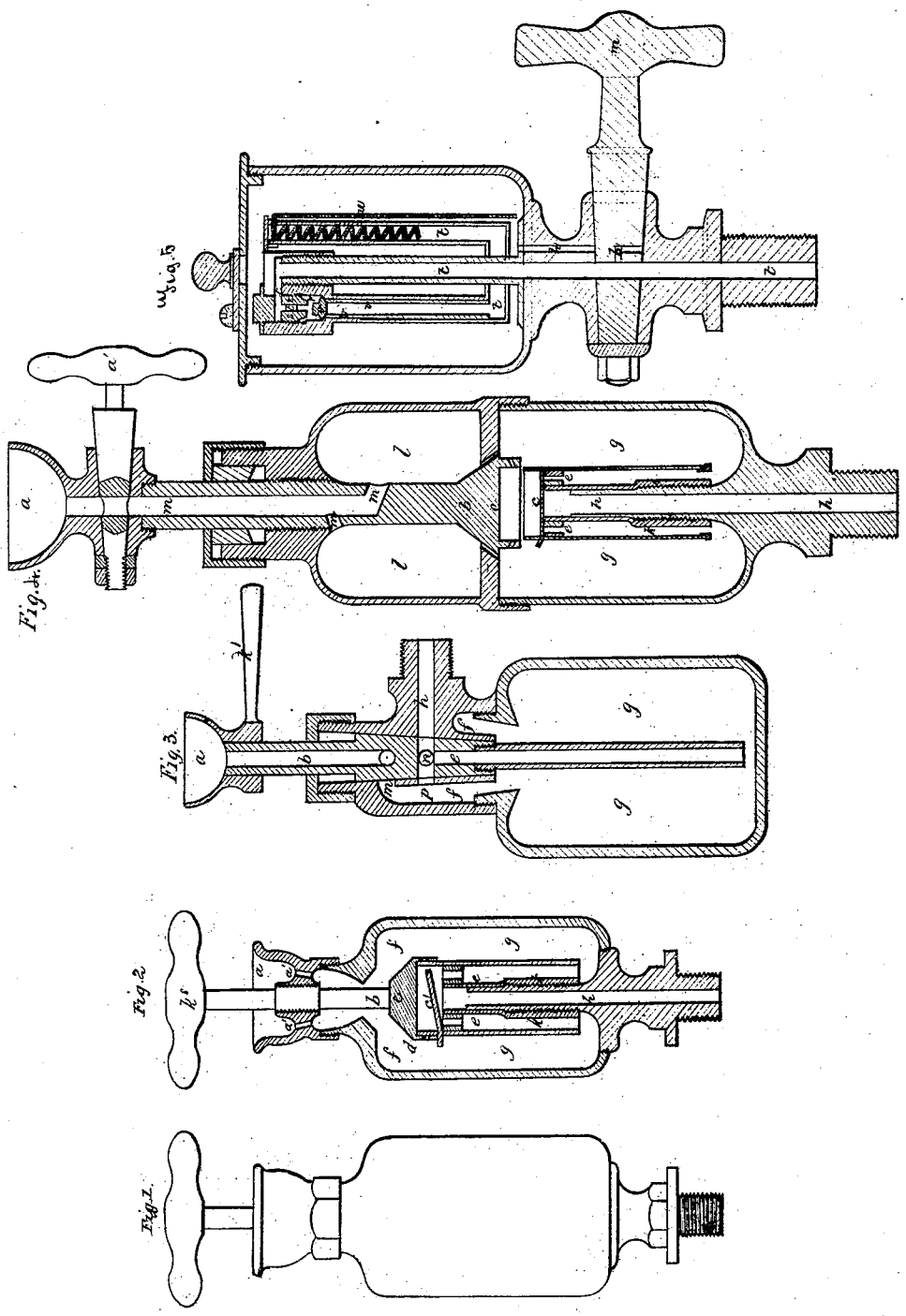
F. Jackson,

Lubricator.

No. 109908. Patented Dec. 6. 1870.



Witnesses
James L. Norris
W. J. Peyton.

Inventor
Francis Jackson
by Pierce Lamb & Norris
Attys

United States Patent Office.

FRANCIS JACKSON, OF WIGAN, ASSIGNOR TO WILLIAM PROSSER, OF MANCHESTER, ENGLAND.

Letters Patent No. 109,908, dated December 6, 1870.

IMPROVEMENT IN LUBRICATORS FOR STEAM-ENGINES.

The Schedule referred to in these Letters Patent and making part of the same.

I, FRANCIS JACKSON, of Wigan, Lancashire, England, have invented "certain new and useful Improvements in Lubricating Apparatus for Steam-Engines," of which the following is a specification.

My invention relates to apparatus for lubricating the pistons and valves of steam-engines.

In the drawing—

Figures 1 and 2 are an elevation and vertical central section of my improved lubricating apparatus.

Figures 3, 4, 5 are similar sections, which illustrate modifications of the said apparatus, and which are hereinafter fully described.

In the apparatus illustrated in figs. 1 and 2 a cup, *a*, is fixed on the top of an oil-vessel or reservoir, and has a screwed valve or top, which opens or closes the communication between the cup and the reservoir.

The valve or tap is so arranged that when it is screwed down on its seating it opens a communication between the cup *a* and the vessel *g*, and at the same time closes the space *d*, while the movable valve or disk *c'*, placed on the top of the central tube *h*, is lifted so as to permit the escape of condensed water down the same tube, the pressure of the oil from the cup to the reservoir having forced it up through the space *e*, which is between the two tubes.

In cases where a vacuum is created, the movable disk *c'* is drawn down and closes the central tube *h*, thus preventing the escape of the oil in the cup by means of a vacuum.

The central tube *h* has a metallic casing, *k*, which is adjustable vertically. By screwing it downward or upward the space for the condensation of steam is increased or diminished, and although I prefer to use a common tube, *h*, for the admission of steam and the emission of oil and condensed water, I do not deem this arrangement absolutely necessary, for the steam-pipe may be made to enter the side of the upper portion of the reservoir, while the central tube *h*, after being provided with a steam-tap below and outside of the reservoir, may be used for the sole purpose of passing the condensed water out of the lubricator.

Although I prefer at present to use two tubes in the position indicated in fig 1, I may use one or more tubes, either placed along the central tube or concentrically with it.

In each modification of my displacement-lubricators a small tube communicates between the oil-chamber and outer atmosphere for the removal of compressed air.

In the modification of my invention, illustrated in fig. 3, I employ a reservoir or vessel, *g*, fitted with a plug having a cup, *a*, at the top. The tube of this cup is bored down the center from the top, and then transversely to the side of the plug. This tube is used to conduct the oil into the upper part *f* of the reservoir or vessel above mentioned.

The plug is also bored along its center for a short distance upward from the bottom. This tube thus formed, together with another tube, serves to convey away through the tube *h* any condensed water which may be formed in the reservoir.

The manner in which the cup acts is as follows:

When oil or other lubricant is to be poured into the reservoir, the handle *k'* is put in line with a point marked on a disk below it, when the bent tube described above is in communication with the opening *m*, and the oil fills the space *g*. If at the time the reservoir be full of water, resulting from the condensation of steam, as is the case with all displacement-lubricators, that water will be removed by the mere pressure of the oil on the surface of the water, the latter being forced up into the tube *e* and out through the tube *h*.

By turning the handle *k'* till it is in a line with another point marked on the disk, the opening to *m* is closed, and the opening *p* is opened, so that a communication is made between the reservoir and tube *h*, while at the same time the communication which existed between the cup *a* and the reservoir is interrupted so that steam issuing through the tube *e* cannot escape out of the vessel. This steam condenses and falls in drops of water to the bottom of the cup, and thus the oil is forced upward and passes out through the tube *e*. The plug is made steam-tight by metallic packing.

I modify the above arrangement so that the lubricator may be filled when steam is admitted into it, (see fig. 4.) For this purpose the oil-space or reservoir is divided transversely into two chambers, which are therefore vertically one above the other.

In this modification a cup, *a*, is placed at the upper end of a tube, *m*, which is screwed through a metallic stuffing-box in the top of and communicating with the upper chamber *l*. The lower end of this tube is made solid, and forms a valve, *b*, to open or close the communication between the two chambers *l* and *g*.

The tube is provided with a stop-tap, *a'*, beneath the cup, and when the tube *m* is screwed upward so as to close the communication between the two chambers, and the tap is opened, the upper chamber *l* may be filled with oil or melted tallow. The tap *a'* is then closed and the tube screwed downward, so as to allow the oil to flow into the lower chamber *g*. This lower chamber is provided with precisely the same arrangement of tubes and valves as the reservoir already described and illustrated in fig. 2, consequently the processes of condensation, displacement of oil, and removal of condensed water are similarly effected.

Fig. 5 illustrates the arrangement of my apparatus as a vacuum lubricator. If the contents of this lubricator are to be entirely and suddenly removed, this may be done by turning up the handle *m*, placing the tube *h* in continuous connection with the tube *t*. Any condensed water present may be thus removed.

Although I find the above arrangements of tubes convenient, I do not limit myself thereto, but may place the valves and tubes in other situations, and may increase or decrease their number.

A tube, *t*, is arranged with its highest part level with the top of the reservoir. The oil from the reservoir passes into this tube by capillary attraction through a cotton-wick, *u*. The size of the wick regulates the quantity of oil to be passed.

The oil is removed from the tube *t* by the pressure caused by the vacuum exerted along its entire length, and the vacuum pressure lifts up a sleeve-valve, *v*, which is perforated at the top, and which moves freely upward or downward. The force of the vacuum pressure forces the oil through this valve into the slightly widened space *p* above it, and thence it passes along the tube *t* into the cylinder.

This lubricator is well adapted for low-pressure engines.

The regulation of the oil is effected by means of the fixed perforated valve *s*, which may be screwed up or down, and the space *p* may be thus increased or diminished.

Claims.

I claim as my invention—

1. A tube or tubes, placed concentrically around the central tube *h*, through which steam is admitted, and in combination with a valve or valves, substantially as shown in fig. 2, and for the purpose set forth.

2. The method of increasing the condensation of steam, and, consequently, the displacement of the oil by means of the metallic casing *k*, adjustable upward and downward, substantially as set forth.

3. The employment of the valve or disk *v*, to prevent the escape of any oil in cases where a vacuum is created in the steam-pipe or steam-chest, substantially as set forth.

4. The plug *m*, with holes bored in it in combination with the tube *h*, for the removal of the condensed water from the cup, substantially as set forth and illustrated in fig. 3.

5. A lubricator, as shown in fig. 4, with two chambers, one above the other, to be successively filled, substantially as and for the purpose set forth.

6. The perforated tube *m*, with a solid end, *b*, acting as a valve, the said tube communicating with the upper chamber, and the valve being between the two chambers, substantially as and for the purpose set forth.

7. The tube or tubes placed concentrically around a central tube, *h*, in combination with the aforesaid valve *b*, and without any opening in the side of the cup, substantially as and for the purpose set forth.

8. The upright tube, valves, and cotton-wick, substantially as shown in fig. 5, and for the purposes set forth.

FRANCIS JACKSON.

Witnesses:

THOS. P. BRASS.

J. JOHNSTON,

Clerks to Messrs. Brockbank & Helder, Solicitors, Whitehaven.