

March 18, 1924.

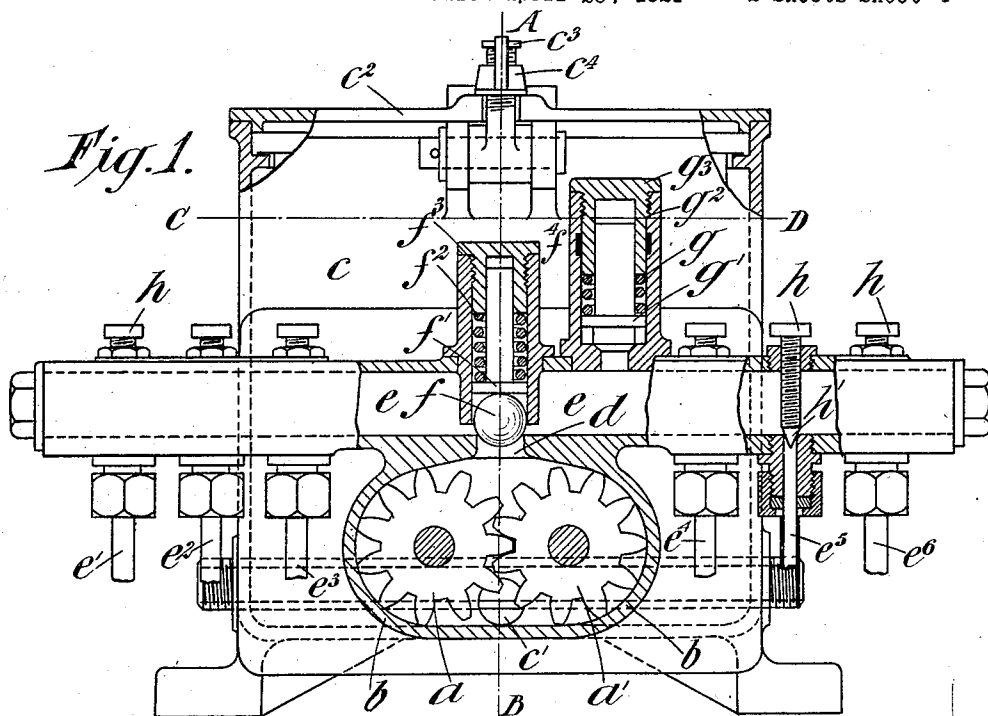
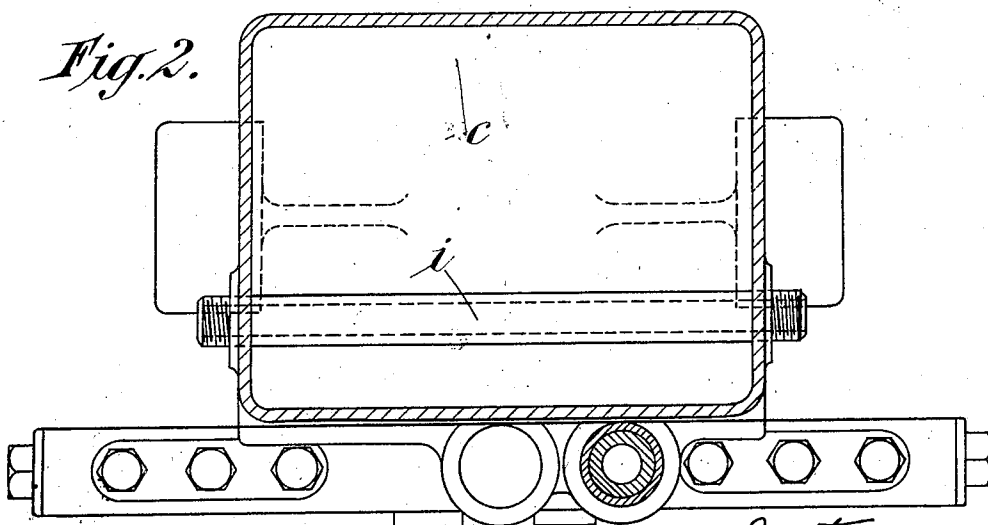
1,487,568

A. E. HOWELL

FORCE FEED LUBRICATOR

Filed April 26, 1921

2 Sheets-Sheet 1



Inventor
A. E. Howell
By *[Signature]*
Att'y.

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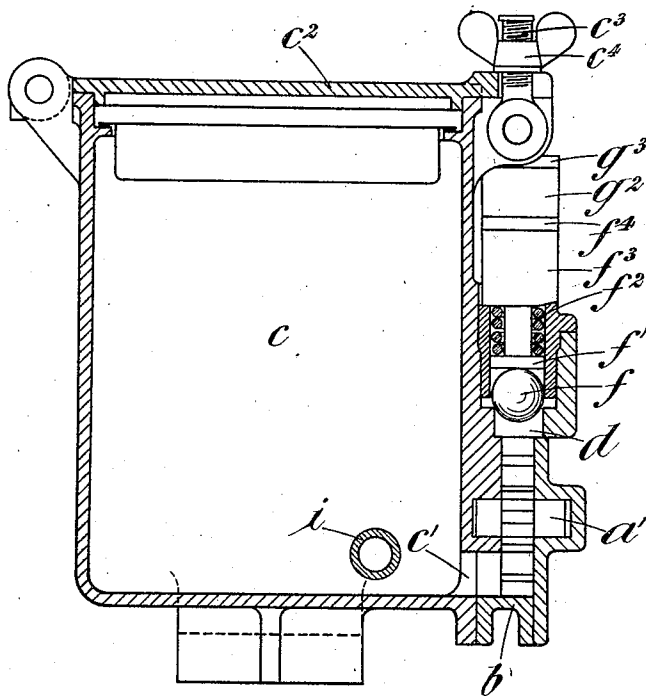


Fig. 3.

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UNITED STATES PATENT OFFICE.

ALFRED EDWARD HOWELL, OF NEWCASTLE-UPON-TYNE, ENGLAND.

FORCE-FEED LUBRICATOR.

Application filed April 26, 1921. Serial No. 464,678.

To all whom it may concern:

Be it known that I, ALFRED EDWARD HOWELL, a subject of the King of Great Britain and Ireland, and a resident of Newcastle-upon-Tyne, county of Northumberland, England, have invented a certain new and useful Improvement in Force-Feed Lubricators (for which I have filed application in England January 27, 1920), of which the following is a specification.

This invention relates to lubricators which are especially applicable for lubricating the cylinders of locomotives and other parts where superheated steam is used, although being applicable to other engines, and the particular object of the invention is to provide an improved arrangement of force-feed lubricator whereby a constant delivery of lubricant is obtained through the agency of one or more pumps of the interlocking gear wheel type enclosed in a casing or casings attached to an oil container and delivery pipe or pipes, the whole being mounted together and self-contained.

The present invention employs in connection with the known type of pump and container referred to, a main delivery pipe or pipes with non-return and relief valves and one or more outlet pipes each fitted with a regulating valve and branching from the main delivery pipe or pipes.

In the accompanying drawings which illustrate an embodiment of my invention:—

Figure 1 is a sectional elevation through the casing.

Figure 2 is a sectional plan on the line C, D of Figure 1; and,

Figure 3 is a vertical cross-section through the oil container and casing on the line A, B of Figure 1.

The pump is of the well-known gear type wherein a pair of toothed wheels *a*, *a'*, rotated together in opposite directions and interlocking with one another, run in a closely fitting casing *b*; oil flows from the adjacent container *c* through the opening *c'* to the lower part of the casing midway between the wheels and is carried round the outer sides of both wheels, in the direction shown by the arrows, occupying the spaces swept through by the rotating teeth, and being impelled towards the outlet *d* and into the delivery pipe *e*. The contact between the wheels *a*, *a'* and the sides of the

casing *b* is constant, so that the oil cannot pass through in a direct course, and the actual transmission of the oil is effected within the spaces between the teeth, each space forming a pocket for a charge of oil, and the teeth at the interlocking point on the centre line form an oil lock, preventing the oil being carried round towards the inlet and away from the delivery.

The gear wheels are conveniently driven from the valve rod or the piston rod of the engine, or by belting or direct-coupled electric motor, through suitable mechanism, not shown in the drawings.

In the construction shown, all working parts of the pump are immersed in oil.

On the delivery side of the pump a non-return valve is provided for the purpose of assisting in maintaining a constant pressure in the delivery pipe, also a relief valve is fitted to prevent any increase of pressure beyond a predetermined limit; this relief valve is connected with the body of the oil container. It should be understood that any number of suitable non-return or relief valves can be fitted.

One suitable form of non-return valve is shown in Figures 1 and 3, and consists of a ball *f*, held on its seat by a disc *f'* which has a stem encircled by a spring *f''*, the whole being enclosed in a sleeve *f'''*. A cover *f''''* is screwed into the sleeve *f'''* so as to compress the spring *f''* and increase the pressure on the ball *f*.

A spring-loaded relief valve is shown in Figure 1, fitted on the delivery pipe *e*. A spring *g* encircles the stem of the valve *g'* in the sleeve *g''* provided with a screwed cover *g'''*.

The delivery side of the pump can be fitted with any number of suitable outlets *e'*, *e''*, *e'''*, *e''''*, *e'''''*, *e''''''*, and in order to permit of the regulation of the supply of oil to each outlet, suitable valves are provided, each consisting for example, of a pointed set-screw *h* and a nipple *h'*, forming a seat for the pointed end of the set-screw.

The container is provided with a hinged cover or lid *c''* adapted to be held in the closed position by means of a hinged bolt *c'''* on the casing, which bolt engages with an open end slot in the lid and is provided with a winged nut *c''''* or the like, whereby the lid may be screwed down.

A steam pipe or coil *i* may also be provided in the container for preventing the

lubricant from solidifying in cold weather.

It is to be understood that any convenient number of gear wheels may be provided in connection with a single casing or container
5 having separate delivery outlets, or, alternatively, one delivery outlet common to all the pumps, and that the gear wheels may be placed in any position vertically, horizontally, or at an angle, and with the oil inlet
10 appropriately disposed in relation to the gear wheels, all as may be considered desirable.

I claim:—

15 A lubricator construction of the class described including a casing constituting an oil reservoir, the bottom of which casing is provided with an opening, a gear pump

housing communicating with the reservoir through said opening, a gear pump arranged within the housing, a distributing manifold
20 arranged above the gear pump housing and communicating therewith through an opening, a sleeve piercing said manifold adjacent the opening connecting the same with the gear pump housing, a ball valve guided
25 in the end of said sleeve, a spring within the sleeve for normally maintaining said ball seated over the opening between the gear pump and the manifold, and a relief valve carried by and communicating with said
30 manifold.

In testimony whereof I have affixed my signature hereto this 5th day of April, 1921.

ALFRED EDWARD HOWELL.