F. W. EDWARDS.

FLUID OPERATED FORCE FEED LUBRICATOR.

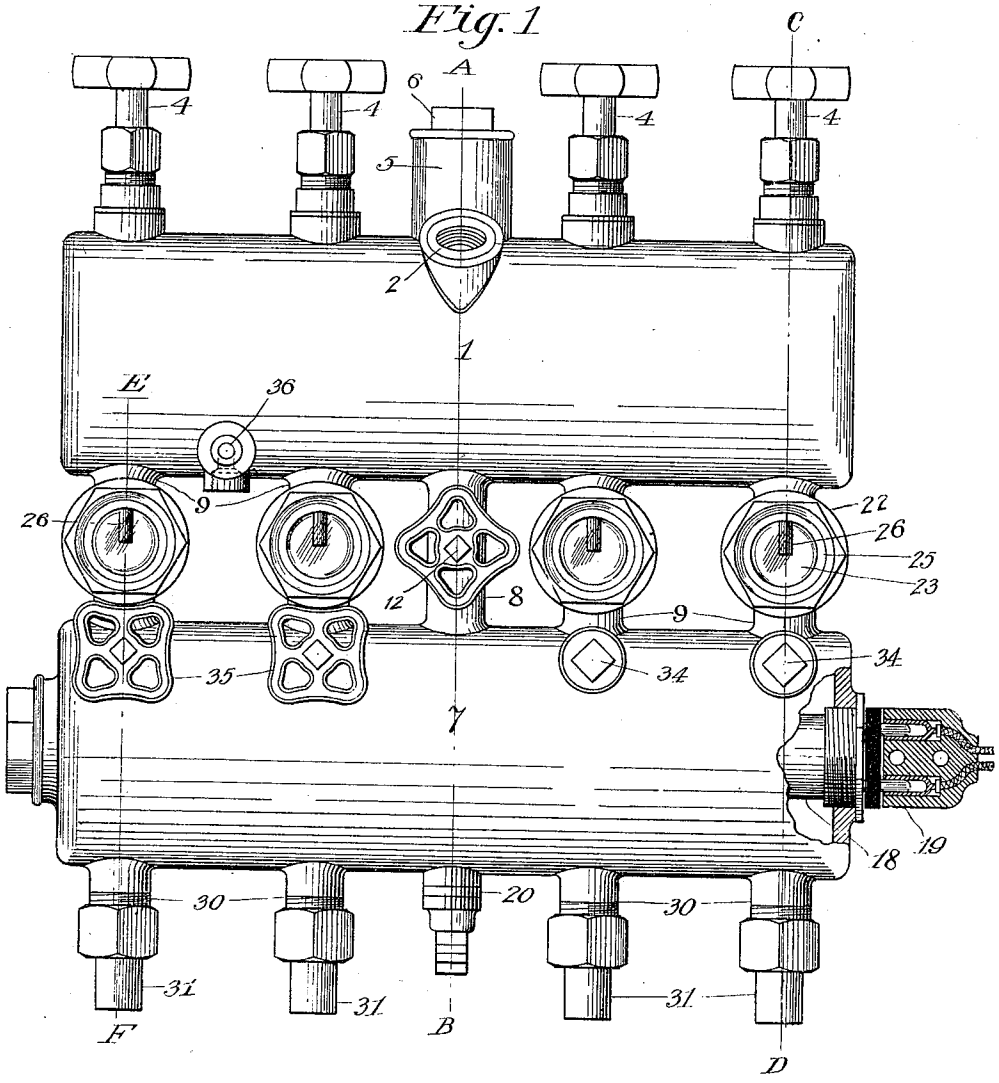
APPLICATION FILED JUNE 29, 1910.

996,321.

Patented June 27, 1911.

2 SHEETS—SHEET 1.

Fig. 1



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2 SHEETS—SHEET 2.

Fig. 2

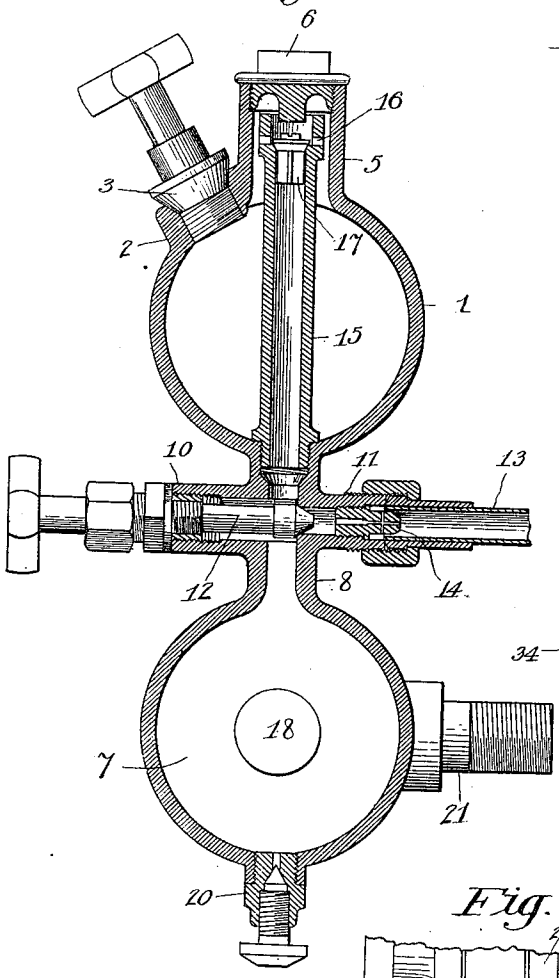


Fig. 3

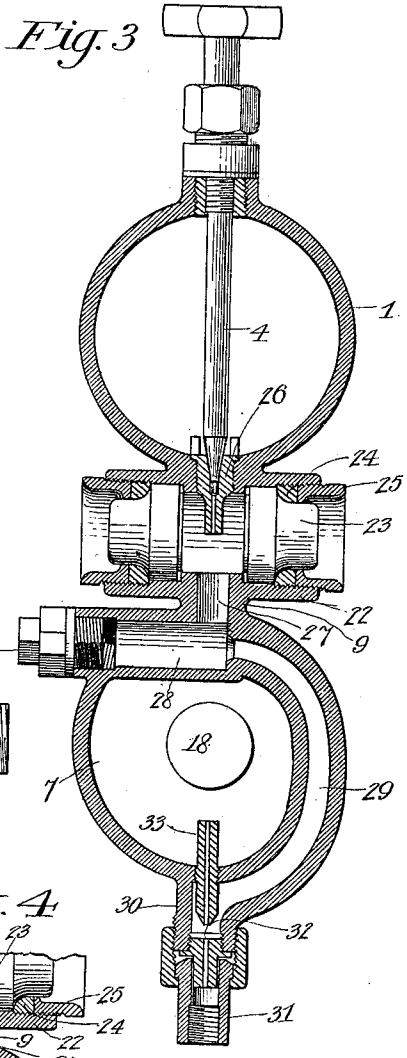
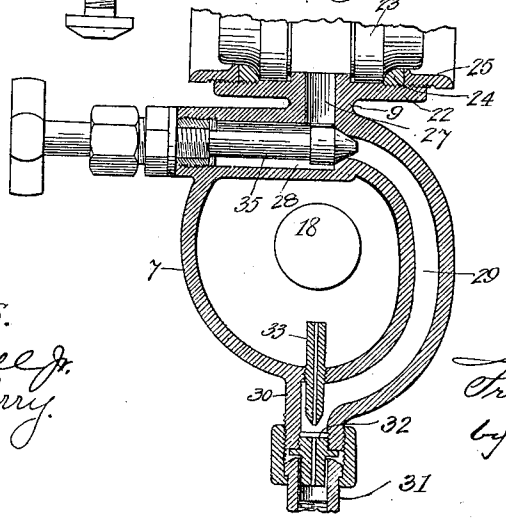


Fig. 4



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UNITED STATES PATENT OFFICE.

FRANK W. EDWARDS, OF LOGANSPORT, INDIANA, ASSIGNOR TO THE CHICAGO LUBRICATOR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

FLUID-OPERATED FORCE-FEED LUBRICATOR.

996,321. Specification of Letters Patent. Patented June 27, 1911.

Application filed June 29, 1910. Serial No. 569,572.

To all whom it may concern:

Be it known that I, FRANK W. EDWARDS, a citizen of the United States, residing at Logansport, in the county of Cass and State of Indiana, have invented a certain new and useful Improvement in Fluid-Operated Force-Feed Lubricators, of which the following is a full, clear, and exact description.

The lubricant used for the lubrication of the wheel flanges of vehicles designed to run upon rails, and especially electric locomotives and electric cars, and the like, is a rather heavy oil, whose fluidity is affected by atmospheric changes, resulting in imperfect flow of the oil to the parts.

The object of the invention is to provide a lubricator which will insure a substantially uniform feed of the oil under all conditions. In attaining this stated object of the invention, the oil-bowl has connected with it an air chamber to supply atmospheric air, or heated air to the oil-bowl so as to maintain the lubricant in a condition to insure its constant and substantially uniform flow to the parts to be lubricated. This air chamber also maintains the air pressure serving to insure the feed of the oil.

Having thus stated the principle of the invention, I will proceed now to describe the same in detail, and then will particularly point out and distinctly claim the part, improvement, or combination which I claim as my invention.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a front elevation, illustrating the two constructions shown in Figs. 3 and 4, part of the right-hand end of the heating chamber being in section. Fig. 2 is a vertical transverse section taken substantially in the plane of line A B, of Fig. 1. Fig. 3 is a vertical transverse section taken substantially in the plane of line C D, of Fig. 1. Fig. 4 is a vertical transverse section taken substantially in the plane of line E F, of Fig. 1.

The oil-bowl 1, may be and is here shown as of cylindrical form, arranged horizontally, and provided with a filling-opening 2, and a filling-valve 3, and any number of feed-controlling valves 4, according to the number of parts to be lubricated. This oil-bowl is also provided with a hollow boss 5, having a closing cap 6.

7 is a cylindrical chamber arranged horizontally in parallel relation to the oil-bowl, and connected therewith by a series of tubes 8 and 9. The tube 8 has horizontal nipples 10 and 11, and in the nipple 10 is arranged a valve 12 having a seat in the nipple 11. The nipple 11 is connected in any suitable way with a pipe 13, which leads to any suitable source of air-supply, such as the air-brake reservoir. Interposed in the nipple 11 is a choke-plug 14 to control in conjunction with the valve 12 the inflow of air to the chamber 7 and oil-bowl 1. In the oil-bowl 1 and preferably screwed into the tube 8, is a tube 15 rising into the hollow boss 5, and provided with lateral openings 16 above the check-valve 17 which seats within the said tube 15. This check-valve opens automatically under the pressure of the up-flowing air, and the air escapes through the openings 16 and out of the open end of the tube 15 into the oil-bowl and rests upon the surface of the oil within the oil-bowl and exerts its pressure thereon to cause the oil to feed through the feed-devices to be described.

In order to heat the oil to render it sufficiently fluid to flow with substantial uniformity and certainty, there is introduced into the chamber 7 any suitable heating devices 18, herein indicated as an electrical device, deriving its current from the electrical apparatus of the engine or other mechanism to which the lubricator is applied, or from any other source. Of course, any other available heater may be used, and for that reason I do not show the details of construction, excepting that an electrical coupling 19 of common form is shown. The heater may be supported in an air-tight manner in either one or both ends of the chamber 7, and it serves to heat the air flowing into said chamber from the air-pipe 13. The thus heated air rises in the oil-bowl through the tube 15.

The chamber 7 is provided with a drain-valve 20 of any suitable construction. This chamber 7 may also be provided with any desired number of lugs 21, for mounting the apparatus on any suitable part of the mechanism to which it is applied.

The tubes 9 receive the sight-feeds, and these sight feeds consist of the laterally extending nipples 22, containing bull's-eyes or other observation glasses 23, held in place therein by packing-rings 24 and nuts 25, although any other suitable sight-feed mechanism may be employed. Opening into each sight-feed, between its glasses, is a feed-tip 26 screwed into the bottom of the oil-bowl and arranged to receive the valve 4 for controlling the feed. These feed-tips are arranged over openings 27 leading into passageways 28 which open into channels 29 formed about one side of the chamber 7, their walls being exposed to the heated air within the chamber, and these channels open into nipples 30 on the bottom of the chamber 7 and these nipples are provided with connections 31 for conveying the lubricant to the parts to be lubricated. The oil delivery channels 29 may be formed by suitable coring and casting, or these channels may be arranged so as to be drilled. I prefer to interpose between the nipples 30 and the pipes 31 choke-plugs 32. Above the choke-plugs and in line therewith are air feed-tips 33 to supply air to the circulating pipes, and to insure the flow of the lubricant after it passes from the lubricating apparatus. The air feed-tip 33 extends above the bottom of the chamber sufficiently far to avoid overflow thereinto of any water of condensation or oil that may accumulate upon the bottom, and so insure a free passage for the escape of the air into the delivery end of the oil passage.

As shown in the two right-hand sight-feeds in Fig. 1, and in the section in Fig. 3, the passageways 28 may be closed by plugs 34, or as shown in the two left-hand sight-feeds of Fig. 1, and the section in Fig. 4, these passageways 28 may be provided with valves 35 seating in the entrances to the channels 29, so as to close such channels against the back-flow of air into them by way of the air feed-tips 33, and hence to prevent escape of air from this source through the openings 27 into the feed-pockets when it is desired to cut into or out of service any one or more of the sight-feeds while the lubricator is under pressure and in service. It is to be noted that such valves may be applied to all of the sight-feeds; or the valves may be entirely dispensed with and all of the sight-feeds provided with plugs 34, or there may be some plugs and some valves as shown in Fig. 1.

36 is a drainage device for draining the oil-bowl if desired.

As already indicated, the apparatus is designed primarily, although not exclusively, for use in oiling the flanges of the wheels of locomotives or motors, and the equipment for conveying the lubricant to the point of distribution may be of any approved character, one instance of which is shown in my Patent No. 948,301, dated February 1, 1910, the connection for such distribution being made through the pipe 31.

The air in the oil-bowl on top of the oil and the air in the chamber 7 and the passages connecting it with the oil-bowl establishes an equalization of pressure which permits the oil to feed out when the feed valves are open. If this equalization were not established by the use of the air pressure, there would be a tendency to form a vacuum in the top of the oil-bowl by reason of the fact that the oil-bowl is closed tight, and this vacuum would tend to prevent the oil feeding by gravity. The check-valve in the air tube in the oil-bowl is arranged to open with the pressure of the air, and remains open with such pressure. Even if the oil should rise in the hollow boss 5 to a height above the tube, it could not overflow into said tube because of the superior pressure of the air within this air-tube.

If the oil should become so heated as to expand, then its pressure would become superior to the pressure of the air and consequently would seat the check-valve and thus prevent the escape of the oil into the air tube, while not interfering at all with the proper feed of the oil through the sight feeds. The overflow of the oil into the air tube and heater chamber 7 would have no more ill result than a waste of oil and the fouling of the said chamber 7, unless the heater should be so hot as to burn the oil, and this last mentioned contingency is the one most to be avoided and is practically avoided by the automatic check-valve.

The air-chamber may be used without the heater, and contain air at atmospheric temperature.

What I claim is:—

1. A lubricator, comprising essentially an oil-bowl, an air-heating chamber, means for admitting air from the said chamber to the oil-bowl, and means to feed the oil from the oil-bowl about the air chamber and exposed to its heat and thence deliver it to the point or points of application.

2. A lubricator, comprising essentially an oil-bowl, an air-heating chamber arranged alongside of the said oil-bowl, an air-passage connecting the oil-bowl and chamber and opening into the oil-bowl above the normal level of oil therein and serving to conduct air into the upper portion of the oil-bowl, and oil-passages extending from the oil-bowl about the air-heating chamber to discharge mediums.

3. A lubricator, comprising essentially an oil-bowl, an air-heating chamber arranged alongside of the said oil-bowl, an air-passage connecting the oil-bowl and chamber and opening into the oil-bowl above the normal level of oil therein and serving to con-

duct air into the upper portion of the oil-bowl, means to control the admission of air into the oil-bowl, and oil-passages extending from the oil-bowl about the air-heating chamber to discharge mediums.

4. A lubricator, comprising essentially an oil-bowl, an air-heating chamber arranged alongside of the said oil-bowl, an air-passage connecting the oil-bowl and chamber and opening into the oil-bowl above the normal level of oil therein and serving to conduct air into the upper portion of the oil-bowl, oil-passages extending from the oil-bowl about the air-heating chamber to discharge mediums, and sight-feed devices interposed in the oil-passages between the oil-bowl and the air-heating chamber.

5. A lubricator, comprising essentially an oil-bowl, an air-heating chamber arranged alongside of the said oil-bowl, an air-passage connecting the oil-bowl and chamber and opening into the oil-bowl above the normal level of oil therein and serving to conduct air into the upper portion of the oil-bowl, a check-valve in the upper portion of said air-passage, and oil-passages extending from the oil-bowl about the air-heating chamber to discharge mediums.

6. A lubricator, comprising essentially an oil-bowl, an air-heating chamber arranged alongside of the said oil-bowl, an air-passage connecting the oil-bowl and chamber and opening into the oil-bowl above the normal level of oil therein and serving to conduct air into the upper portion of the oil-bowl, oil-passages extending from the oil-bowl about the air-heating chamber to discharge mediums, and a valve in the oil-passage to control the flow of oil through it.

7. A lubricator, comprising essentially an oil-bowl, an air-heating chamber arranged alongside of the said oil-bowl, an air-passage connecting the oil-bowl and chamber and opening into the oil-bowl above the normal level of oil therein and serving to conduct air into the upper portion of the oil-bowl, oil-passages extending from the oil-bowl about the air-heating chamber to discharge mediums, and an independent air inlet from the air-heating chamber to the delivery end of the oil-passage.

8. A lubricator, having an oil-bowl, sight-feeds attached thereto at the bottom, feed-tips projecting from the bottom of the oil-bowl into the sight-feeds, independent valves coöperating with said feed-tips controllable from the outside of the oil-bowl, an air-heating chamber arranged alongside of the oil-bowl and communicating with it, air-heating devices arranged within the air-heating chamber, and oil-delivery channels extending about the chamber.

9. A lubricator, comprising an oil-bowl, an air-heating chamber arranged parallel to said oil-bowl, an air-passage connecting the chamber and oil-bowl, a check-valve in said passage, tubes connecting the oil-bowl and chamber and provided with sight-feeds, and channels communicating with said tubes at one end and extending about the chamber to points of discharge for conducting oil from the oil-bowl to points of use and exposed to the heat of the chamber.

10. A lubricator, comprising an oil-bowl, an air pressure chamber arranged parallel to said oil-bowl, an air passage connecting the chamber and the oil bowl, a check valve in said passage, tubes connecting the oil-bowl and chamber and provided with sight feeds connected with oil supply passages on the oil-bowl side, and channels communicating with said tubes at one end and extending about the chamber to points of discharge for conducting oil from the oil-bowl to points of use.

In testimony whereof I have hereunto set my hand this 27th day of June A. D. 1910.

FRANK W. EDWARDS.

Witnesses:
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