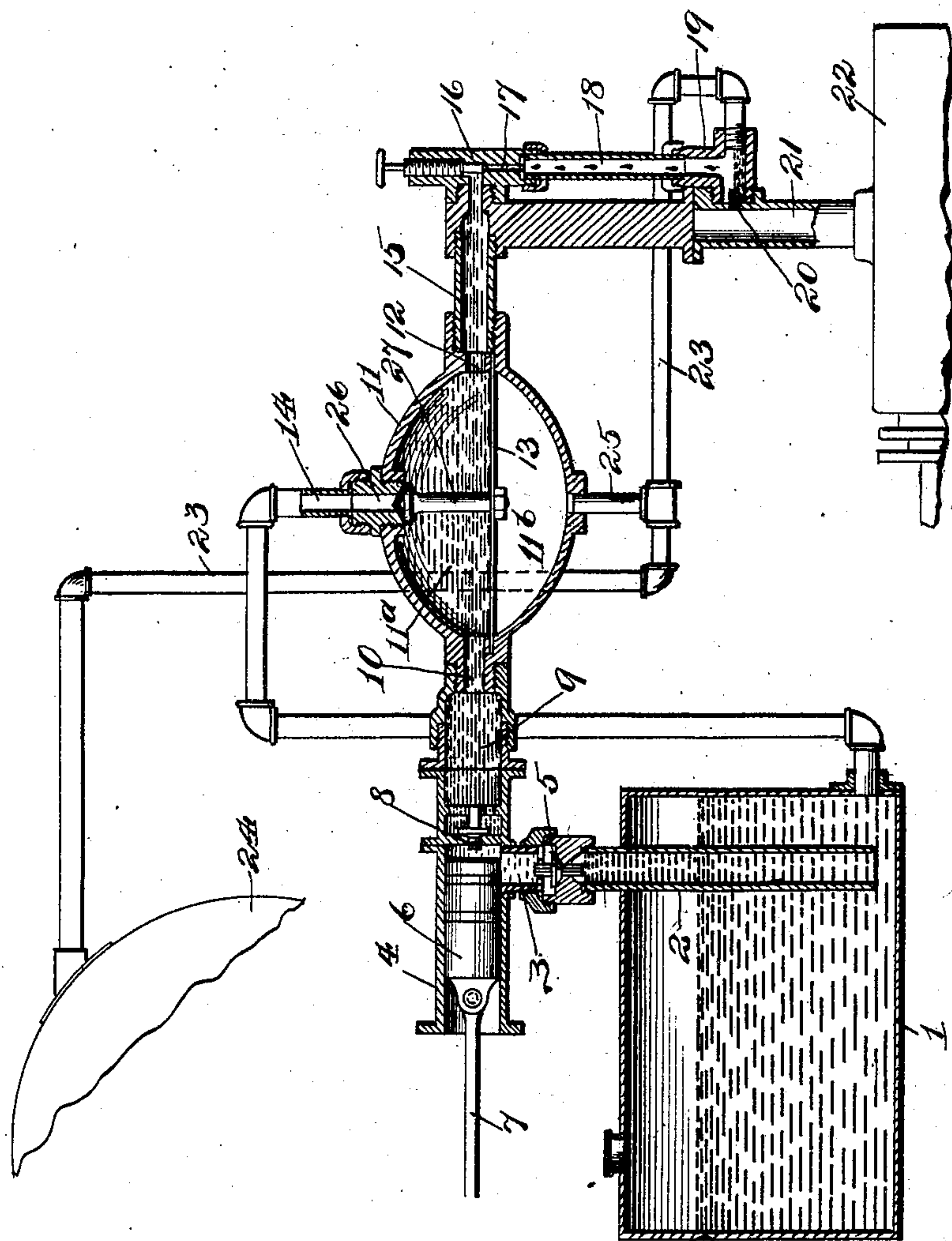


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J. TROTTER.  
LUBRICATOR.

APPLICATION FILED JUNE 29, 1901.



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# UNITED STATES PATENT OFFICE.

JAMES TROTTER, OF SYCAMORE, ILLINOIS.

## LUBRICATOR.

**SPECIFICATION** forming part of Letters Patent No. 785,452, dated March 21, 1905.

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*To all whom it may concern:*

Be it known that I, JAMES TROTTER, residing at Sycamore, in the county of Dekalb and State of Illinois, have invented certain new and useful Improvements in Lubricators, of which the following is a full, clear, and exact specification.

My invention relates to lubricators, and more particularly to that class of automatic-feed lubricators especially designed for injecting the lubricant into a chamber containing pressure—such, for example, as the steam chest or cylinder of a steam-engine, and particularly locomotive-engines, in which especial difficulty in lubricating the cylinder and valve is experienced at times by the suction or vacuum in the cylinder, resulting from the action of the piston during the drifting of the locomotive, causing the lubricant to feed too fast and at other times by the clogging of the oil-pipe due to the hardening of the oil as a result of the high temperature of the steam to which it is subjected for balancing the pressure above the column. Hence the common practice of locomotive-engineers of “shutting off” to create the vacuum below the column to aid the steam-pressure above in blowing out the oil-pipe.

The primary object of this invention is to avoid these defects and provide means for causing the oil to feed automatically and uniformly without subjecting the supply to the steam, so that no portion of the oil will come in contact with the steam, excepting that which is being fed through the feed-contraction or other means that may be provided for dripping the oil from the supply to the place of consumption or use.

More specifically stated, the object of my invention is to force the oil through the feed-contraction or to the place of consumption by mechanical means, such as a pump, and to maintain a uniform pressure of the oil in said feed-contraction under all conditions, so that the feeding of the oil therethrough will be automatic and uniform at all times.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said objects and certain

other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawing, and more particularly pointed out in the claims.

The said drawing is a vertical longitudinal sectional view of my improved lubricator, partly in elevation, showing its application to a steam-chest as an illustration of one of the many uses to which my invention may be put.

1 is a tank which may be of any suitable form and construction and placed in any convenient position for containing a supply of lubricant and which is connected by pipe 2 to the induction-port 3 of an oil-pump 4, said port having a downwardly-closing check 5, which prevents the oil from flowing out of the pump back into the pipe 1. The pump 4 contains a piston 6, whose rod 7 may be connected to any suitable part of the moving machinery or operated in any other desired way. The valve education-port 8 of the pump 4 is connected by coupling 9 or any other suitable means to an inlet-port 10 of a diaphragm-chamber 11, having an outlet-port 12 and containing a flexible diaphragm or other equivalent device 13, dividing the chamber 11 into upper and lower compartments 11<sup>a</sup> 11<sup>b</sup>. The upper compartment 11<sup>a</sup> is connected by an oil overflow or relief pipe 14 with the tank 1 and is also connected by pipe or other suitable connection 15 with a needle-valve housing 16, having a feed-contraction 17, which is closed by the needle-valve and which leads into glass 18 of the sight-feed, the lower end of glass 18 being socketed in any suitable manner in a fitting 19, which is connected by a choke or capillary tube 20 with the pipe or passage 21, which leads into steam-chest 22 or other place where the lubricant or oil is to be consumed or used. The fitting 19 is also connected by a pressure-pipe 23 directly with the boiler or other source of fluid under pressure, and pipe 23 is also connected by branch pipe 25 to the lower compartment 11<sup>b</sup> of the diaphragm-chamber, the outlet of the upper compartment 11<sup>a</sup> into pipe 14 being provided with a valve-seat 26, which is normally closed by a valve 27, secured to diaphragm 13 and held closed by the pressure admitted to the under



side of the diaphragm through pipe 23 at such times as said pressure exceeds the pressure of the oil induced by the pump in the upper compartment 11<sup>a</sup>. With a lubricator  
 5 thus constructed it will be seen that the pump 4 6 may be of sufficient capacity to supply a surplus of oil to the upper compartment 11<sup>a</sup> and force the same through the needle-valve contraction 17 without first subjecting any of  
 10 it to the action of the steam, and the surplus over and above that which flows through said contraction will return to the tank 1 in a cool and natural state via the oil-relief 14, the valve 27 being of course open at all times  
 15 when the pump is supplying more oil than is required by the feeder, and hence during the running of the engine when the pipe 21 is subjected to back pressure from the steam-chest the oil will feed uniformly, nevertheless,  
 20 because the pressure at one end of the choke 20, coming from the pipe 21, will be counter-balanced by the pressure coming from pipe 23 at the other end of the choke, which may be so situated, as shown in the drawing, as  
 25 to be below the level of the oil accumulating at the bottom of the fitting 19. The steam-pressure in the fitting 19, however, cannot escape through the feed-contraction 17 into the oil-supply, because of the fact that the  
 30 pressure of the pump is greater or at least equal to the pressure of said steam, and the oil and steam cannot pass through the passage at one and the same time because of its capillary form.

35 Under some conditions the diaphragm 13 might be made sufficient in itself to hold the valve 27 to its seat; but in order that its elasticity may not be depended upon the lower compartment 11<sup>b</sup> of the diaphragm-chamber  
 40 is connected with the boiler-pipe 23, as before described, and therefore it will be seen that the valve 27 cannot open and permit the oil to escape back into the supply-tank 1 until the pressure of the oil in the diaphragm-  
 45 chamber exceeds the steam-pressure in the fitting 19, in which the choke 20 is located.

When the locomotive is drifting or running without pressure and a vacuum is consequently induced in pipe 21, excessive feeding of the  
 50 oil through the choke 20 will be prevented, nevertheless, as will be understood, by the balancing pressure admitted to the sight-feed glass 18 through pipe 23, it being understood that the choke 20 is so small that the entire  
 55 suction therethrough may be supplied by the pressure admitted through pipe 23 without influencing the flow through feed-contraction 17 or producing any appreciable suction in the sight-feed, and as a consequence the drip  
 60 through the sight-feed contraction 17 (and by "feed-contraction" is meant any reduction of the passage or construction of the passage required for feeding the oil in the requisite quantity from the supply) will be uniform un-

der all conditions, whether the engine be run- 65  
 ning under steam or drifting.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. In a device for the purpose described the 70  
 combination of means for forcing a supply of lubricant, a lubricant-passage communicating therewith and having a feed-contraction arranged to connect with the part to be lubricated, an oil-relief valve in said passage be- 75  
 tween the supply and said contraction, a pressure-regulator for controlling said relief-valve and a source of fluid-pressure connected with said lubricant-passage between said contrac-  
 tion and the part to be lubricated and also 80  
 connected with said pressure-regulator for closing said relief-valve, substantially as set forth.

2. In a device for the purpose described the 85  
 combination of means for furnishing a supply of lubricant, a lubricant-passage leading therefrom and arranged to connect with the part to be lubricated, a feed-contraction in said passage, an oil-relief in said passage be- 90  
 tween the supply and said contraction, and a connection from said oil-relief to said passage between the contraction and the part to be lubricated whereby said oil-relief would be  
 closed by an excess of pressure in said connection, substantially as set forth. 95

3. In a device for the purpose described the 95  
 combination of means for furnishing a supply of lubricant, a diaphragm-chamber having an inlet and outlet and an oil-relief, a diaphragm dividing said chamber into two com- 100  
 partments one of which contains said inlet and outlet and oil-relief, a valve secured to said diaphragm for closing said relief, a pump connected to said inlet and to said supply means, a sight-feed connected to said outlet and ar- 105  
 ranged to connect with the part to be lubricated and a source of fluid under pressure connected with said sight-feed and with the other compartment of said diaphragm-chamber, substantially as set forth. 110

4. In a device for the purpose described the 110  
 combination of means for furnishing a supply of lubricant, a diaphragm-chamber having an inlet and an outlet and an oil-relief, a connection between said supply and oil-relief, 115  
 a diaphragm in said chamber having a valve closing said oil-relief, a pump for forcing said supply into said inlet, a sight-feed connected with said outlet and arranged to connect with the part to be lubricated and a source of fluid 120  
 under pressure connected with said diaphragm-chamber for holding said valve closed and also connected with said sight-feed, substantially as set forth.

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Witnesses:

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