No. 828,327. PATENTED AUG. 14, 1906.

J. MEEHAN.

AUTOMATIC LUBRICATOR.

APPLICATION FILED FEB. 9, 1906.

2 SHEETS—SHEET 1.

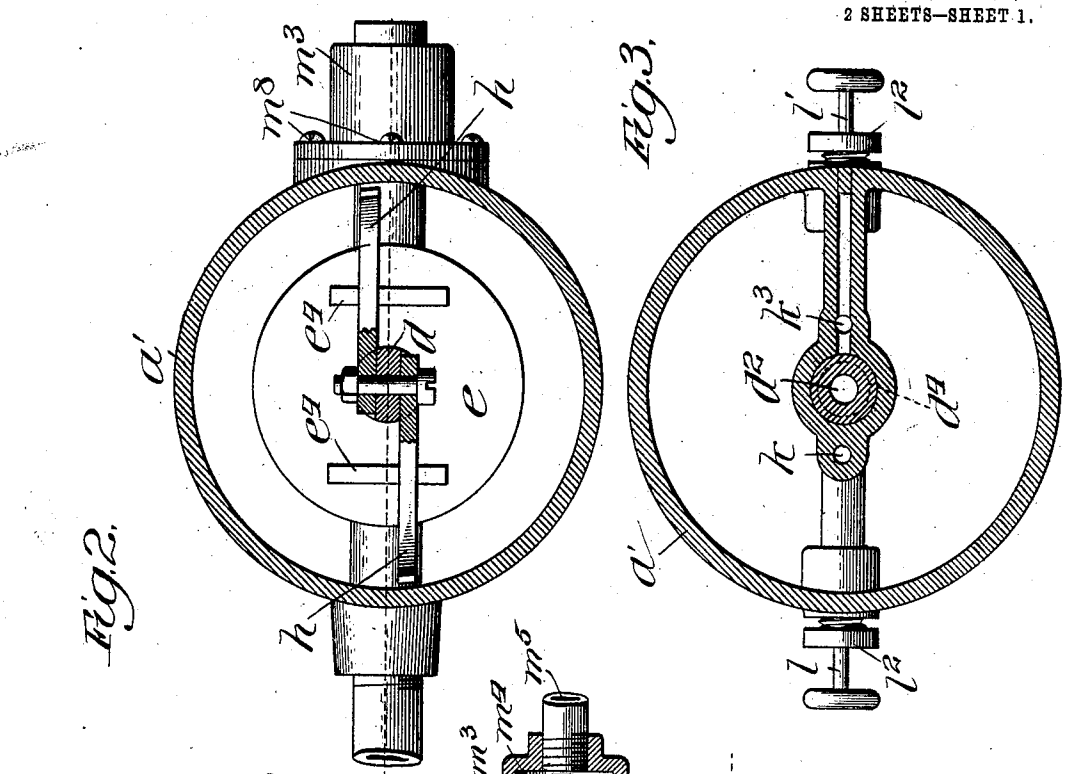

Fig. 2.

Fig. 3.

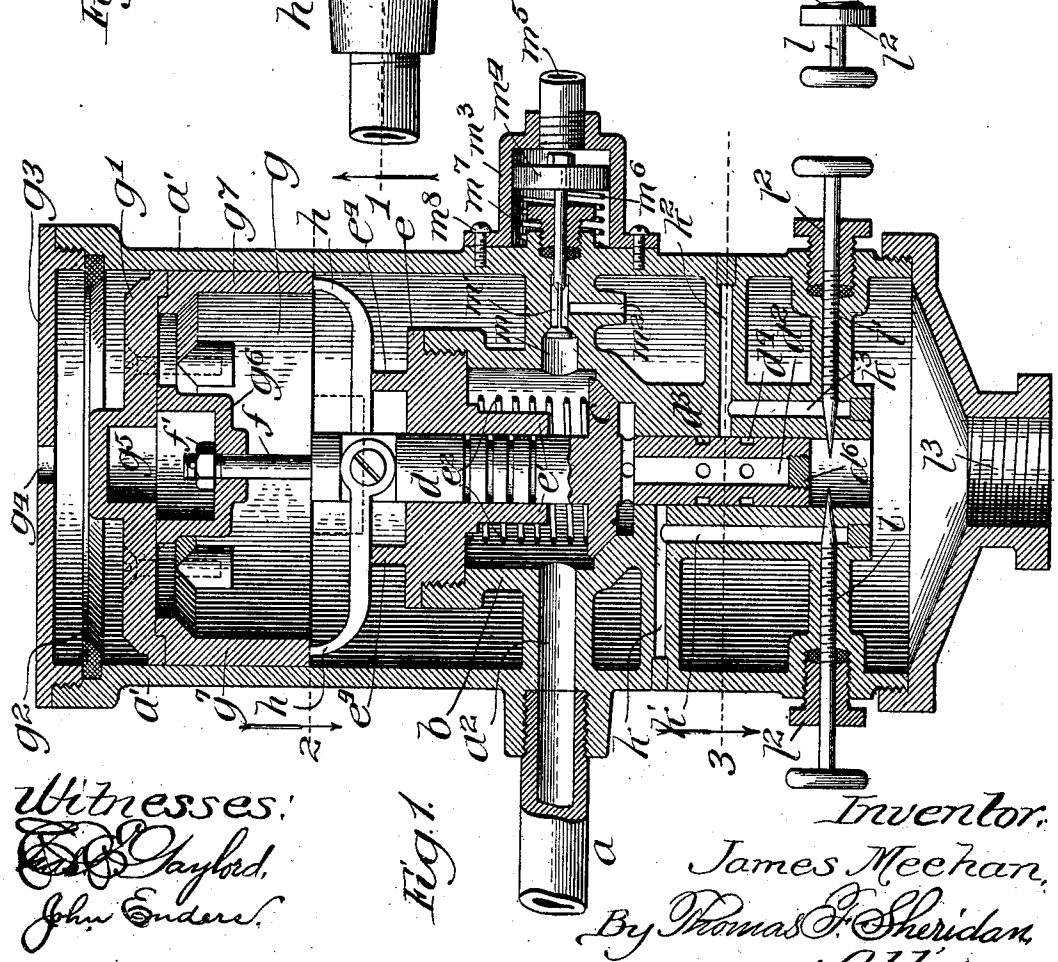

Fig. 1.

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2 SHEETS—SHEET 2.

Fig. 5.

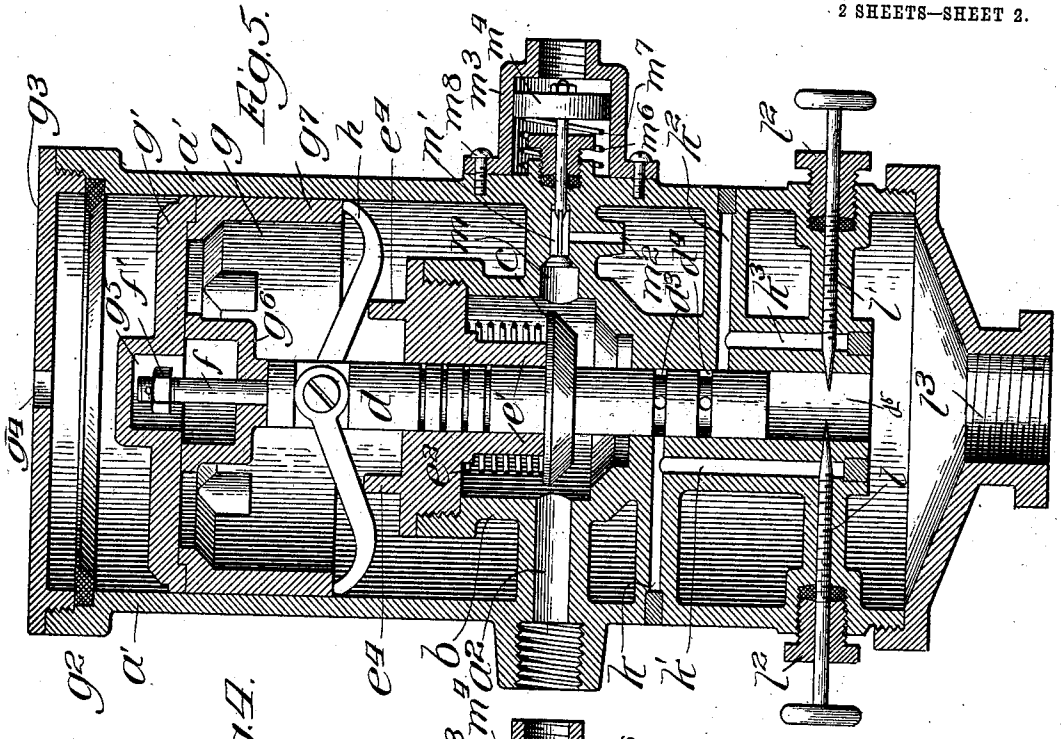
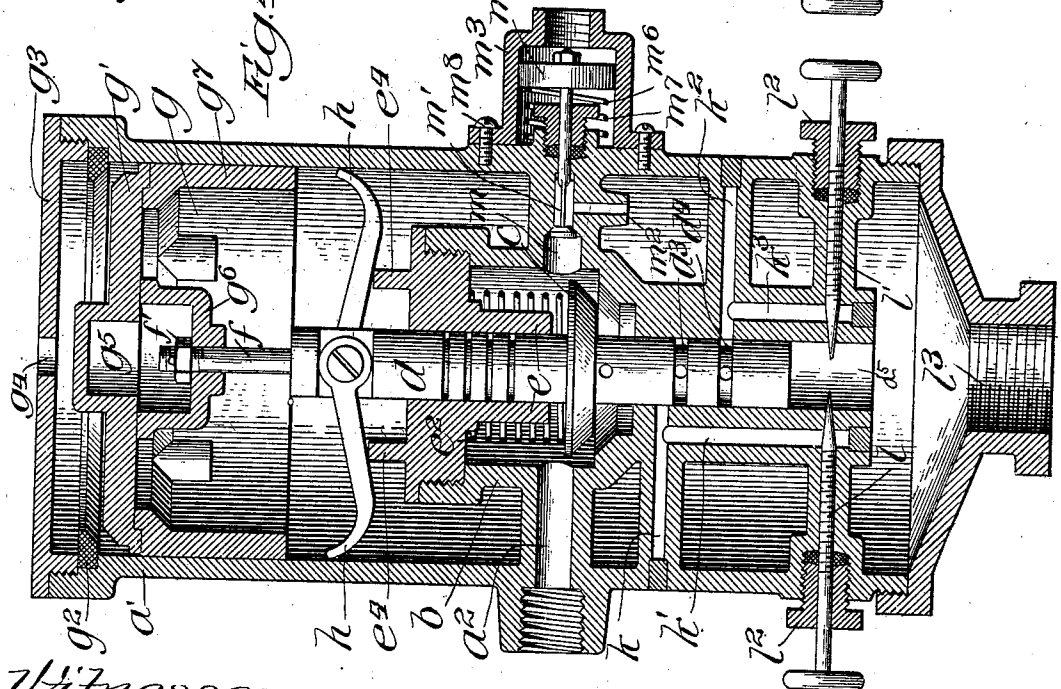


Fig. 4.



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AUTOMATIC LUBRICATOR.

No. 828,327. Specification of Letters Patent. Patented Aug. 14, 1906.

Application filed February 9, 1906. Serial No. 300,296.

To all whom it may concern:

Be it known that I, JAMES MEEHAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Lubricators, of which the following is a specification.

My invention relates to automatic lubricators of the type shown, for example, in my Patent No. 777,120, of December 13, 1904. In this former patent I have shown a lubricator having a reservoir provided with a differential piston adapted to maintain the lubricant at a pressure in excess of pressure in the valve-chest, a passage for the lubricant from such reservoir communicating with the interior of the valve-chest, and means for automatically opening such passage from the oil-reservoir when the valve-chest contains steam under pressure, closing such passage when the valve-chest is empty and the engine not in operation and opening such oil-passage when the engine is running without steam in the valve-chest or coasting, so as to form a partial vacuum in such valve-chest.

The object of my present invention is to provide a simple, economical, and efficient means for opening and closing the supply-passage and for regulating the supply of oil, so as to furnish the oil to the engine in such constant quantities as may be desired.

My invention consists in the features hereinafter described and claimed.

In the drawings, Figure 1 is a sectional elevation on the line 1 of Fig. 2, showing my improved valve-operating mechanism, showing parts in position when the engine is at rest; Fig. 2, a section on the line 2 of Fig. 1; Fig. 3, a section on the line 3 of Fig. 1; Fig. 4, a view similar to Fig. 1, showing the parts in position when the engine is running under steam and showing the ports open to admit oil to the engine; and Fig. 5, a view similar to Fig. 1, showing the parts in position when the engine is drifting or coasting, so as to form a partial vacuum in the steam-chest, with the ports open to admit oil to the engine.

In the drawings, a represents an oil-supply pipe leading from the oil-reservoir. At its end this pipe is connected to the cylindrical valve-chamber a', which chamber is provided with a suitable valve-casing b and a passage a^2, leading from the end of the pipe to the interior of the valve-casing. Within the valve-casing is a valve c, provided with an upwardly-extending stem d and with a lower hollow stem d^2, the valve and its upper and lower stems having a reciprocating movement in the valve-casing. Surrounding the upper valve-stem between the valve and the top e of the casing is a suitable spring e^2. The depending collar e', forming part of the head e of the valve-chamber, forms a suitable bearing for the upper valve-stem. Passages d^3 d^4 are formed in the lower valve-stem communicating with the interior thereof, these passages being suitably spaced apart for a purpose presently to be described. The lower portion of the valve-casing is provided with a suitable passage d^5, forming a bearing for the lower valve-stem. It will be understood that the lower hollow valve-stem is closed at its lower end by any suitable means, such as a block d^6. Communicating with this passage d^5 are passages k k^2, bored horizontally in the valve-casing. Communicating with these horizontal passages are vertical passages k' k^3, which at their lower ends communicate through suitable passages (not shown) with the central passage d^5. The passages from the lower end of the passages k' k^3 to the central passage-way are controlled by suitable needle-valves l, by means of which the flow of oil to the engine may be regulated. Extending from the upper end of the upper valve-stem is a screw-threaded rod f, passing at its upper end into a chamber g^5, formed in the piston-head g'. This rod is secured to a suitable lug g^6, attached to the under surface of the piston-head, the piston g comprising the piston-head g' and a ring g^7 surrounding it, forming a hollow piston. The piston-head on its outer surface is beveled, as shown, and the cylindrical piston-chamber a' is provided with a valve-seat g^2 near its upper end, with which the beveled surface is adapted to contact when the piston-head is in its uppermost position. Above the piston the cylindrical piston-chamber is provided with a top plate g^3, having a passage g^4 to the atmosphere. The valve-chamber e is provided on its upper outer surface with fulcrum-blocks e^4, and an upper stem has pivoted thereto lever-arms h, resting on these fulcrum-blocks. The outer ends of the levers h are turned upwardly and contact with the lower face of the depending ring g^7 of the piston.

The operation of my device as so far described may now be understood. When the

engine is running under steam, the pressure of the steam from the steam-chest is communicated to the under surface of the piston-head, causing the latter to take its uppermost position, with its beveled surface in contact with the valve-seat. As it moves upwardly the piston carries with it the rod *f*, and consequently the valve-stem, raising the valve *c* away from its seat and bringing the ports d^4 k^2 into register, so as to permit the passage of oil from the supply-pipe through the hollow valve-stem and these ports to the engine. When the engine is drifting, so that a partial vacuum is formed in the steam-chest, the atmospheric pressure on the outer surface of the piston-head causes the piston to be depressed, thus operating the levers *h*, causing them to raise the valve-stem and rod *f*, as shown in Fig. 5 of the drawings, and bringing the ports d^3 *k* into communication, thus opening the passage from the supply-pipe to the engine. It will be understood that when there is this partial vacuum in the valve-chest, unless some means are provided for regulating the supply of oil, a greater amount of oil would be drawn down through the passages by reason of the vacuum than when the engine is running under steam, the pressure of the steam tending to retard the flow of oil somewhat, so that the amount of oil supplied under these conditions would vary. By the use of the needle regulating-valves, however, the passages may be so adjusted that a constant amount of oil may be supplied to the engine under whatever conditions it is running. It is sometimes desirable that a means should be provided for furnishing an additional quantity of oil to the engine. For this purpose I show a passage *m'*, closed by the valve *m*, leading from the valve-chamber through a passage-way m^2 to the engine. The valve *m* is controlled by a piston m^4 in the piston-chamber m^3. The valve is normally held to its seat by the spring m^7, bearing against the piston and the bottom of the chamber. This piston-chamber m^3 may be secured to the valve-cylinder by any suitable means, such as screws m^8. The face of the piston m^4 opposite the valve is subjected to fluid-pressure through the pipe m^5, leading to a suitable source of supply, which may be under the direct control of the engineer. By admitting fluid-pressure to the pipe m^5 the engineer is enabled to open the valve *m'*, thus admitting oil directly to the engine, as will be readily understood. It will be understood that this device is to be attached to the steam-chest of the engine by any suitable means l^3.

I claim—

1. An automatic lubricator, comprising a source of oil-supply, oil passage-ways from the source of supply to the parts to be lubricated, a piston-operated valve controlling the admission of oil to the oil passage-ways, and means for raising the valve when the piston is either raised or lowered.

2. An automatic lubricator, comprising a source of oil-supply, a valve controlling the admission of oil from the oil-supply to the parts to be lubricated, a piston having a sliding connection with the valve-stem, one side of the piston being in communication with a source of steam-pressure and the opposite side in communication with the atmosphere, and means operated by the piston for raising the valve when the piston is lowered.

3. An automatic lubricator, comprising a source of oil-supply, a piston-operated valve controlling the admission of oil from the oil-supply to the parts to be lubricated, an auxiliary valve also establishing communication from the source of oil-supply to the parts to be lubricated, and means under control of the engineer for opening the auxiliary valve.

4. An automatic lubricator, comprising a source of oil-supply, spaced passage-ways in the valve-casing, a valve controlling the admission of oil from the supply to the casing and passage-ways, said valve having correspondingly-spaced passages, a piston connected to the valve-stem, adapted to be raised to bring one of the valve-passages into alinement with one of the casing-passages, and means for raising the valve when the piston is lowered to bring the other valve and casing passage-ways into alinement.

5. An automatic lubricator comprising a source of oil-supply, oil passage-ways from the source of supply to the parts to be lubricated, a piston-operated valve controlling the admission of oil to the oil passage-ways, means for raising the valve when the piston is either raised or lowered to permit the passage of oil from the source of supply to the passage-ways, and means for admitting a constant supply of oil to the parts to be lubricated when the piston is either raised or lowered.

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