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LUBRICATING MEANS FOR TWO-CYCLE INTERNAL COMBUSTION ENGINES.

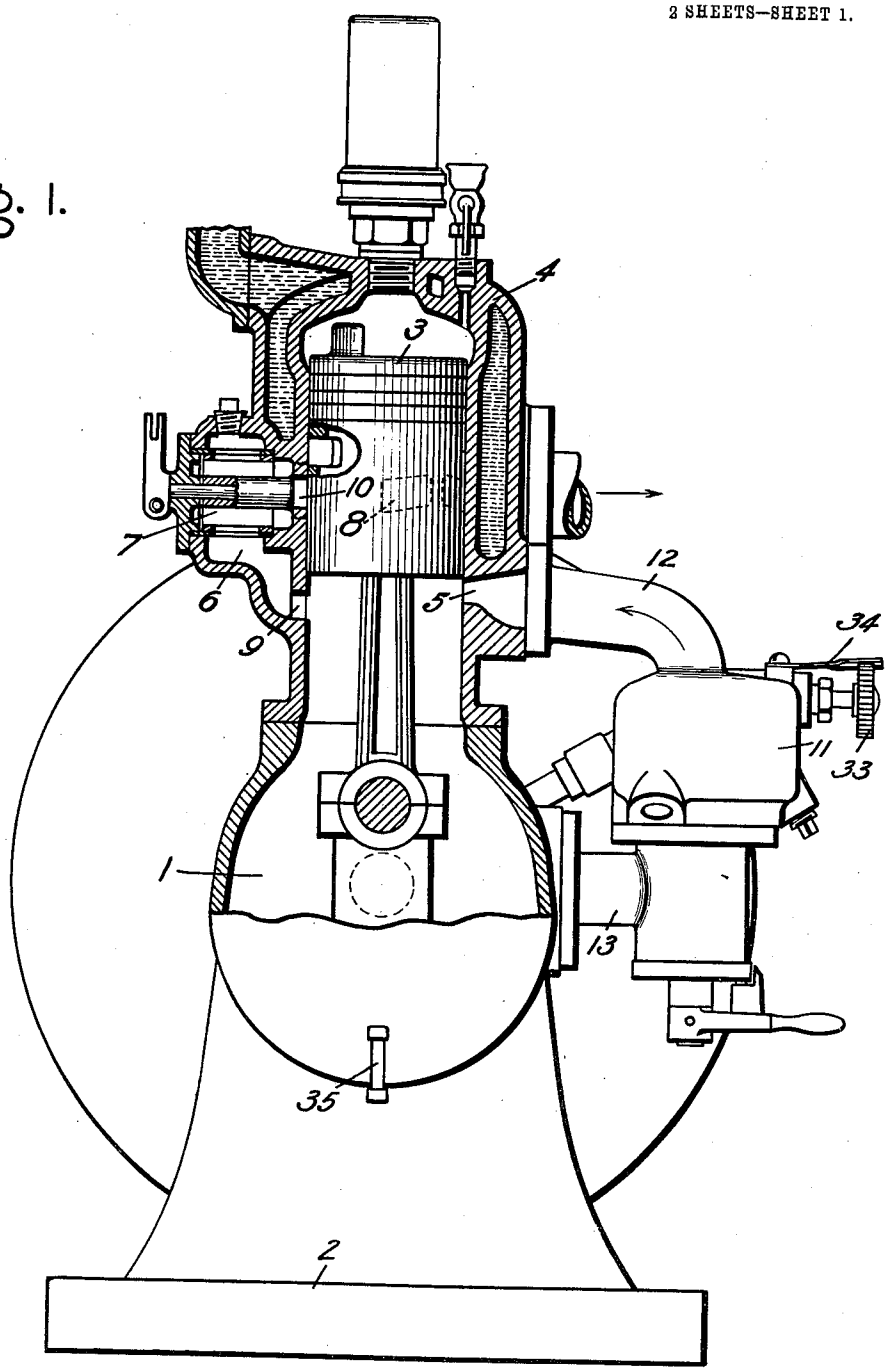
APPLICATION FILED APR. 19, 1911.

1,087,387.

Patented Feb. 17, 1914.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

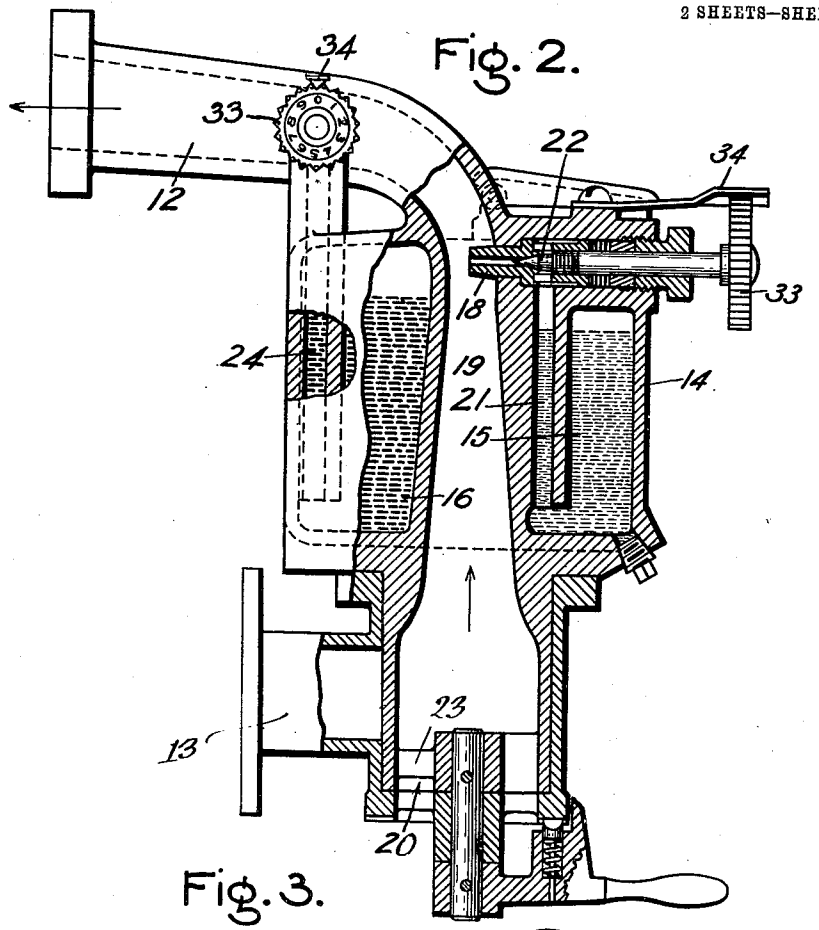
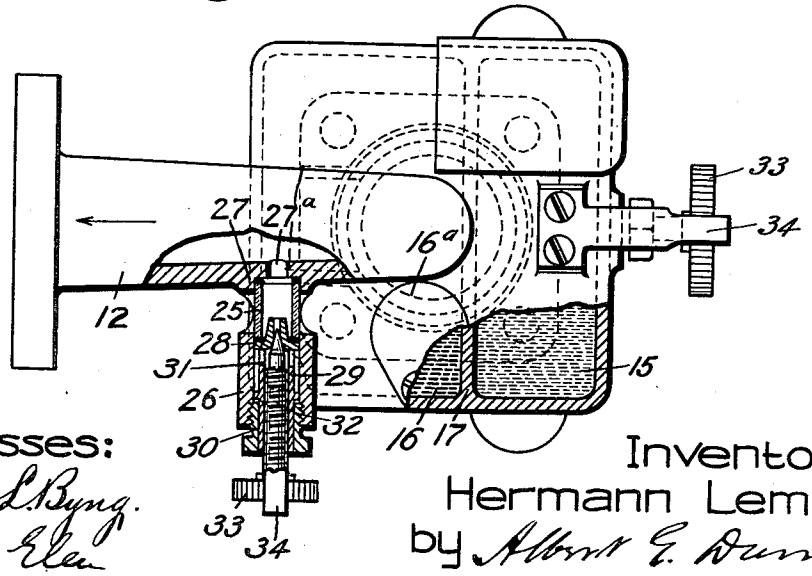


Fig. 3.



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UNITED STATES PATENT OFFICE.

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LUBRICATING MEANS FOR TWO-CYCLE INTERNAL-COMBUSTION ENGINES.

1,087,387. Specification of Letters Patent. Patented Feb. 17, 1914.

Application filed April 19, 1911. Serial No. 621,979.

To all whom it may concern:

Be it known that I, HERMANN LEMP, a citizen of the United States, residing at Lynn, county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Lubricating Means for Two-Cycle Internal-Combustion Engines, of which the following is a specification.

The present invention relates to the lubrication of two cycle internal combustion engines, and has for its object to provide a simple and effective means for the purpose which is automatic in its action and requires no thought or care on the part of the operator after the proper quantity of lubricant is once determined.

In the accompanying drawings which illustrate my invention, Figure 1 is a view, partly in section, of a two cycle three port internal combustion engine; Fig. 2 is a sectional view of a lubricating means and carbureter; and Fig. 3 is a plan view of the same with certain of the parts broken away.

In order to illustrate the construction and mode of operation of my invention, I have shown a two cycle engine and a carbureter; these, however, do not of themselves possess any novel features.

Briefly stated, my invention comprises an oil reservoir located at some point below the level of the port admitting lubricating oil to the crank chamber, with a conduit connecting said reservoir and crank chamber whereby the piston on its suction stroke raises oil from the reservoir and sucks it into the crank chamber, which oil is in turn forced with the combustible mixture through the transfer passage and ports into the cylinder by the downward movement of the piston. At some point in the said oil conduit is located a regulating valve and also a sight feed glass to enable the operator to see if the proper quantity of oil is passing into the engine. It will thus be seen that the oil has to be raised from one level to a higher level before it can enter the engine. By reason of this all danger of accidentally flooding the engine or emptying the reservoir by gravity is avoided.

1 indicates a closed crank chamber in which the combustible mixture is compressed. It is provided with a suitable base 2.

3 indicates a trunk piston and 4 the cylinder mounted on the crank case, the said cylinder being provided with an inlet port 5 for the combustible mixture, a transfer passage 6 controlled by a governor actuated throttle valve 7, and an exhaust port 8. The transfer passage has an inlet port 9 and a discharge port 10. All of these ports are controlled by the piston 3 as it moves up and down.

11 indicates a carbureter and 12 the conduit for carrying the combustible mixture to the inlet port 5. The carbureter is supported by a bracket 13 from the crank case.

Referring to Figs. 2 and 3, 14 indicates a casting containing a chamber 15 for gasolene or other fuel, and a reservoir 16 for lubricating oil. The chamber and reservoir are separated by the vertical partition 17. Gasolene is supplied to the chamber 15 by any suitable means, such as a pump or float feed device. The reservoir is filled with oil through an opening in the top provided with a cover 16ª. By combining the carbureter and lubricating means in one structure, I avoid extra parts, and at the same time am able to locate them where they are readily accessible.

18 indicates a spray nozzle for the gasolene which projects into the tapered passage 19 that communicates with the atmosphere by the intake 20. The gasolene flows from the chamber 15 through the passage 21 to the nozzle under the control of the hand-operated needle valve 22. The passage 19 communicates with the conduit 12 leading to the crank case. The supply of air through the intake to the tapered passage 19 is controlled by the hand-actuated valve 23 made after the fashion of a stove damper.

Formed in the casing 14 of the reservoir, or extending into it and terminating near the bottom thereof, is a conduit 24 whose upper end opens into the conduit 12 that conveys the combustible mixture to the cylinder. The advantage of this arrangement resides in the fact that the oil is conveyed along with a relatively large column of elastic fluid and is thereby caused to enter into a more or less finely divided state, which means that all surfaces will be lubricated instead of the lubrication being restricted to certain small portions. At some point between the upper end of the oil conduit 24 and the mixture conduit 12 leading to the engine, is located a sight feed glass 25. As shown it is horizontally situated between a

head-like portion 26 formed on the conduit 24 above the reservoir and a socket 27 formed on the side of the conduit 12 and having a central orifice 27ª. The glass tube 25 is slipped into place through the head 26, the bore being of sufficient diameter for the purpose. It is held in place between suitable washers and a disk 28, the latter having a central projection containing an oil orifice. The disk is held by a tube 29 carried by a screw-threaded plug 30. The inner end of the tube has one or more openings 31 through which oil flows from the conduit 24 into the sight feed glass. The flow of oil is controlled by the regulating needle valve 32. The handle of the valve is provided with notches 33 to receive the end of a spring of the same character as the spring 34 that keeps the gasolene valve 22 from turning.

The action of my invention is as follows: As the piston moves upward it forms a slight vacuum in the crank case, and when said piston uncovers the port 5 the combustible mixture is sucked into the crank case from the carbureter. At the same time said suction effect also raises oil from the reservoir 16 and causes it to flow through the conduit 24, head 26, past valve 32, into the sight feed glass tube 25, and thence through the orifice 27ª into the conduit 12 where it mixes and flows along with said combustible mixture. As the piston moves downward it first closes the port 5, then the port 9, and at about the end of the down stroke of the piston the combustible mixture with the oil contained therein in a more or less finely divided state is forced by its pressure through the transfer passage 6 and ports 9 and 10 when the port 9 registers with the port in the wall of the piston and the port 10 is uncovered by the piston. On the up stroke the charge is compressed and the lubricant caused to lubricate the side walls of the cylinder. At or about the end of the upward stroke the charge is fired by a sparking or other device in the usual way.

It will be seen that my invention possesses many advantages: As the speed of the engine increases or decreases, the amount of lubricant supplied thereto will also increase or decrease, and this without thought on the part of the operator. The lubricating system is, as will be observed, always ready for action. Since the oil reservoir is located below the point of admission to the engine, it follows that the oil cannot flow into the engine when it is not running and hence the necessity of looking after oil valves is avoided. By properly adjusting the needle valve 32 the proper supply of oil will be supplied at all times. When the weather is cold, it may be desirable to open the valve 32 a little more than for normal operation until the oil is heated, after which it can be readjusted. If desired, I may use a gage glass 35 by which it may be determined if the oil supply is in excess and oil is collecting in the bottom of the crank case chamber.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. A hydro-carbon engine comprising a piston cylinder and a closed crank case, the latter having an orifice in its wall through which lubricant is admitted to the crank chamber and from which it is forced by the piston into the cylinder above the piston head, in combination with a reservoir for the lubricant situated below the level of said orifice, and a conduit extending into and receiving lubricant from the reservoir and delivering it to said orifice on the suction stroke of the piston.

2. A hydrocarbon engine comprising a piston, a cylinder, a closed crank case, a carbureter, and a conduit conveying a combustible mixture from the carbureter to the crank case, in combination with an oil reservoir situated below the level of said conduit, and a conduit extending into the reservoir and communicating with the mixture conveying conduit at a point between the carbureter and engine, the said piston on its suction stroke acting to suck combustible mixture and also lubricating oil from the conduit into the crank case.

3. A hydrocarbon engine comprising a piston, a cylinder having a port in its wall adjacent its inner end and a closed crank case connected to said end of the cylinder, in combination with an oil reservoir situated below the level of the port, a conduit whose lower end extends into the reservoir and whose upper end communicates with the port so that the piston on its suction stroke will suck lubricant from the reservoir into the crank chamber and on its return stroke will shut off the port, a sight feed glass in the conduit, and a regulating valve also in said conduit.

4. A hydrocarbon engine comprising a piston, a cylinder, and a closed crank case, the latter having an orifice, in combination with a casting located below the level of said orifice and containing fuel and lubricant chambers, a conduit formed integral therewith that conveys a combustible mixture from the fuel chamber to the crank case chamber, a second conduit also integral with the casting whose lower end extends into the lubricant chamber and its upper end into proximity to the mixture conveying conduit, the piston acting on its suction stroke to suck lubricant into the crank case chamber, a sight feed glass located between said conduit and the mixture conveying conduit, and a hand valve carried by the upper end of the lubricant carrying conduit for regulating the passage of lubricant.

5. An internal combustion engine comprising a piston, a cylinder, a closed crank case which is in open communication with one end of the cylinder, a carbureter for supplying a combustible mixture, a lubricating oil reservoir, and means connecting the carbureter and reservoir to the interior of the crank case to deliver lubricating oil with the mixture to said case under the influence of the suction action of the piston, the piston on its return stroke shutting off delivery from said means.

6. An internal combustion engine comprising a piston, a cylinder, and a closed crank case having a port, in combination with a reservoir for lubricating oil situated below the level of the port, a carbureter that supplies a combustible charge to the interior of the crank case, and a conduit receiving lubricating oil from the reservoir and delivering it to said port under the influence of the suction action of the piston to mingle with said charge and pass into the cylinder therewith.

7. An internal combustion engine comprising a piston, a cylinder, a closed crank case which is in open communication with one end of the cylinder, there being a port in the cylinder wall, and means supplying a mixture of combustible charge and lubricating oil through said port to the interior of the crank case under the influence of the suction action of the piston, the piston on its return stroke covering the port and thereby checking delivery from said means.

8. An internal combustion engine comprising a piston, a cylinder, a closed crank case connected to the inner end of the cylinder, there being a port in the wall of the cylinder adjacent to said end, a reservoir for lubricant situated below the port, and a conduit delivering lubricant from the reservoir to the port under the action of the suction stroke of the piston, the piston covering the port on its return stroke.

In witness whereof, I have hereunto set my hand this seventeenth day of April, 1911.

HERMANN LEMP.

Witnesses:
JOHN A. MCMANUS, Jr.,
CHARLES A. BARNARD.