

Oct. 26, 1937.

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UPPER CYLINDER LUBRICATOR

2,096,808

Filed Jan. 16, 1937

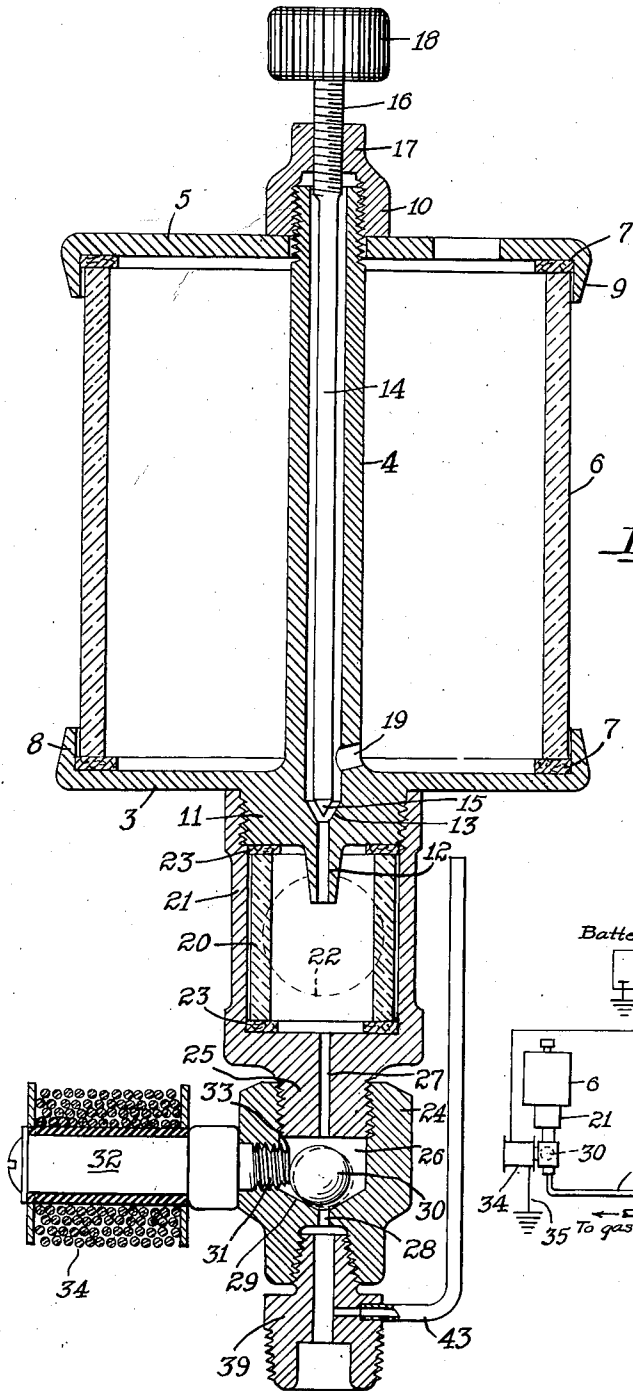


Fig. 1.

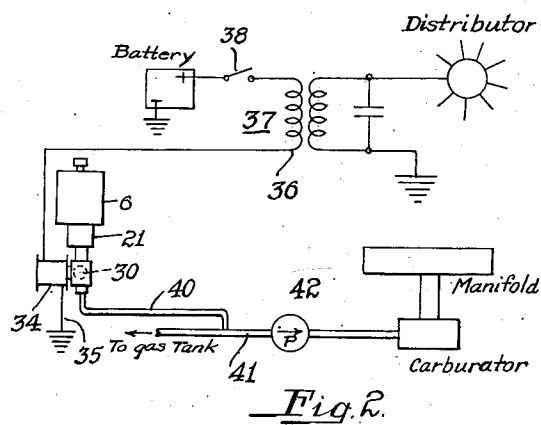


Fig. 2.

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UNITED STATES PATENT OFFICE

2,096,808

UPPER CYLINDER LUBRICATOR

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Application January 16, 1937, Serial No. 120,952

6 Claims. (Cl. 123—196)

This invention relates to devices for feeding liquid lubricant to the upper cylinder parts and valve stems of internal combustion engines and is particularly adapted for use in connection with the internal combustion engines of motor vehicles.

Numerous devices have been placed on the market and others have been disclosed in patents having for their purpose the obtaining of what is known as upper cylinder and valve lubrication for the internal combustion engines of motor vehicles.

The oil delivery in most of these prior devices varies in accordance with variations in pressure within the intake manifold of the engine and because of this, it is extremely difficult to adjust such devices so as not to overfeed oil during idling of the engine and still obtain sufficient oil during periods when the control valve of the carbureter is open any substantial amount.

We have found that if a suitable grade of oil for upper cylinder and valve lubrication is fed into the fuel line between the fuel tank and the fuel pump or into the carbureter float chamber in properly adjusted quantities for average operation of the engine, satisfactory upper cylinder and valve lubrication can be obtained, and an object of this invention is to produce a simple, easily regulated device for delivering by gravity a drop by drop feed of lubricating oil to the fuel line of the internal combustion engine of a motor vehicle at some point in advance of the point at which the liquid fuel is picked up by the air traversing the carbureter.

Another object is to provide a device such as above outlined which is automatic in its operation, that is in which the feed of lubricating oil starts either when the ignition switch is closed or when the battery charging generator starts to deliver current and in which the feed stops when the ignition switch is opened or when the battery charging generator stops delivering current.

These, as well as other objects, which will readily appear to those skilled in this particular art, we obtain by means of the device described in the specification and illustrated in the drawing accompanying and forming part of this application and in which similar elements are denoted by like characters.

In the drawing:—

Figure 1 is a view in sectional elevation of the oil feeding device of our invention; and

Fig. 2 is a diagrammatic illustration disclosing one manner of connecting up the device of Fig. 1.

The device of our invention comprises a reservoir for holding a supply of lubricating oil, a needle valve for controlling the drop by drop gravity feed of oil from the reservoir, a window or sight feed glass for visibly indicating and de-

termining the desired drop by drop feed of oil, a valve chamber below the window or sight feed glass and provided with an outlet orifice in its bottom surrounded by a seat for a steel ball for normally closing the valve chamber outlet, an electromagnet having its coil connected either in series with the ignition coil of the engine, in connection with which the device is used and having one end of its core extending into the valve chamber in line with said ball, tubing for connecting the device to the fuel line on the inlet side of the fuel pump or to the carbureter float chamber and means for venting the system to the atmosphere at a point adjacent the valve chamber outlet and below the ball controlling said outlet.

The reservoir is preferably made of a size to hold a liberal supply of oil and has a base member 3 provided with an upstanding centrally located tubular member 4, a top member 5 and a glass cylinder 6. Soft annular gaskets 7 preferably formed of cork are positioned between the top and bottom of the glass cylinder and the top and bottom members 3 and 5 respectively. The bottom member is provided with an upstanding annular flange 8 which surrounds the bottom of the cylinder 6, while the top member 5 is provided with a depending annular flange 9 which surrounds the top of the cylinder. Central tubular member 4 has its upper outer portion threaded and an internally threaded nut 10 securely clamps the assembly into a rigid structure.

Base member 3 at its center is provided with a depending circular boss 11 and depending from the center of this is a discharge nozzle 12.

A tapered valve seat 13 is formed at the junction of the internal bore of tubular member 4 and the central bore of nozzle 12. A pin 14 having its lower end coned as shown at 15 has its upper end enlarged and threaded as shown at 16 for threaded engagement with the bore of the upper reduced portion 17 of clamping nut 10. Pin 14 at its top is provided with a knurled head 18 by means of which the valve may be adjusted.

The interior of the reservoir by means of a duct 19 drilled through a wall of tubular member 4 near its bottom is placed in communication with the interior bore of tubular member 4 and it will be apparent that the drop by drop gravity feed of oil from the reservoir may be controlled by means of the needle valve comprising seat 13 and the coned end 15 of pin 14.

A tubular sight glass 20 is held in position below nozzle 12 by means of a more or less cylindrically formed housing 21. The upper end of this housing is threaded onto central boss 11 of bottom member 3 and is provided with oppositely positioned circular windows or openings

one of which is shown dotted at 22 so that the drop by drop gravity discharge from nozzle 12 may be seen and the needle valve adjusted to obtain the feed desired.

5 Soft gaskets 23 also preferably of cork are held in place above and below tubular sight glass 20.

A valve housing 24 threaded onto a depending boss 25 of housing member 21 forms a valve chamber 26 which communicates with the interior of the sight glass by means of a duct 27.

Valve chamber 26 is provided with a centrally located outlet port 28 and the floor of the chamber surrounding the outlet 28 is coned as shown at 29 to form a valve seat for a steel ball 30.

15 Valve housing 24 is preferably formed of brass or some other non-magnetic material and one side wall thereof is drilled and tapped to receive the threaded end 31 of the core 32 of an electromagnet. The inner end of this core 20 within valve chamber 26 is provided with a contact member 33 formed of brass or some other non-magnetic material. The electromagnet carries a suitable winding 34 one side of which is adapted to be grounded as shown at 35 Figure 2, while the other side is adapted to be connected to the primary side 36 of the ignition coil 37 of the motor vehicle, so that as the ignition switch 38 is closed, the electromagnet will be energized and ball 30 rocked from its seat as shown in Fig. 30 1 (the normal position of the ball is shown by dotted lines) and the oil within valve chamber 26 allowed to flow through valve chamber outlet 28.

The valve chamber housing by means of a 35 suitable fitting 39 is adapted to be connected by suitable piping 40 to fuel line 41 between the gas tank (not shown) and fuel pump 42 as diagrammatically illustrated in Figure 2 or piping 40 may lead directly to the float chamber of the carbureter.

40 A vent pipe 43 connects with the interior of fitting 39 and preferably extends up to about the level of the top of the sight glass 20 for the purpose of venting the fuel line 41 (not shown in Fig. 1 but shown in Fig. 2) to the atmosphere.

45 While we have shown the coil of the electromagnet connected to the primary side of the ignition coil, it will be understood that where such coil is not readily accessible one side of the electromagnet may be connected to the ungrounded terminal of the battery charging generator of the motor vehicle. In such case the feed of oil will begin when the engine starts and will stop when the engine stops.

50 It will be seen that our device when the right number of drops of oil per minute is determined and the feed set for that number, is automatic in its operation; oil feed starting when such feed is needed and stopping when the need ceases.

60 In installations where fuel is fed by gravity to the carbureter, our oil feeding device is connected up so that it delivers its drop by drop feed to the float chamber of the carbureter.

In installations where the fuel is supplied from 65 a vacuum tank the reservoir of our oil feeding device is set at such a height that the sight feed glass is slightly above the fuel level in the vacuum tank.

70 Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. The combination with an oil reservoir having a bottom outlet, of a needle valve controlling

the gravity feed through said outlet, a sight glass below said outlet, a valve chamber below said sight glass and having a bottom outlet, a valve ball normally closing said outlet, an electromagnet having its core projecting into said valve chamber through a side wall thereof, piping for conducting to the fuel line of an internal combustion engine oil passing said ball and an air vent in said line adjacent said ball.

2. The combination with an oil reservoir having a needle valve controlled bottom outlet, of means for visibly indicating the drop by drop feed through said outlet, a valve chamber formed of non-magnetic material, located below said means and having a bottom outlet, a steel ball 15 for closing said outlet, an electromagnet having its core extending into said valve chamber to a point adjacent said ball and a non-magnetic covering for the end of said core adjacent said ball.

3. In a device adapted to supply lubricating oil to the fuel line of the engine of a motor vehicle and in combination with the ignition coil and ignition switch therefor, a lubricating oil reservoir, a valve for controlling the gravity discharge 25 of oil from such reservoir, means for visibly indicating such discharge, a valve chamber below said means, a normally closed valve in said chamber, an electromagnet connected to the primary side of the ignition coil of the engine and having 30 its core so positioned with relation to said valve that when the ignition switch is closed said coil will be energized and said valve opened to permit oil to pass to the fuel being delivered to the engine.

4. In a device for feeding lubricating oil into the fuel line of a motor vehicle internal combustion engine, a reservoir for said oil, a valve for controlling the gravity feed of oil from said reservoir, means for visibly indicating said feed, 40 a valve chamber below said means and having its outlet connected by tubing adapted to deliver oil to the liquid fuel prior to the point at which it is atomized in the carbureter, a ball in the valve chamber normally closing the valve chamber outlet and an electromagnet having its core extending into said valve chamber in such manner than when energized said ball will be moved to open said outlet and means for energizing said electromagnet.

5. The combination with an oil reservoir, of a valve controlled discharge outlet, means for visibly indicating the discharge from said outlet, a valve chamber below said means and having a bottom outlet, a ball normally closing said outlet, 55 an electromagnet having its core extending into said valve chamber for cooperating with said ball and having its end adjacent said ball provided with a non-magnetic contact member and an oil conduit communicating with the valve 60 chamber outlet.

6. The combination with an oil reservoir having a bottom outlet, of a needle valve controlling the gravity feed through said outlet, a sight glass below said outlet, a valve chamber below said 65 sight glass and having a bottom outlet, a valve ball normally closing said outlet, an electromagnet having its core projecting into said valve chamber through a side wall thereof, and piping for conducting to the fuel line of an internal 70 combustion engine oil passing said ball.

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