

June 8, 1926.

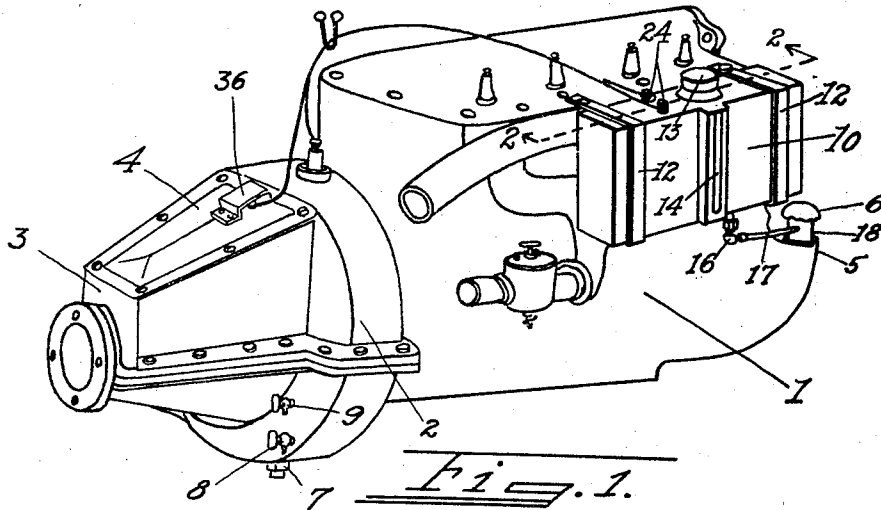
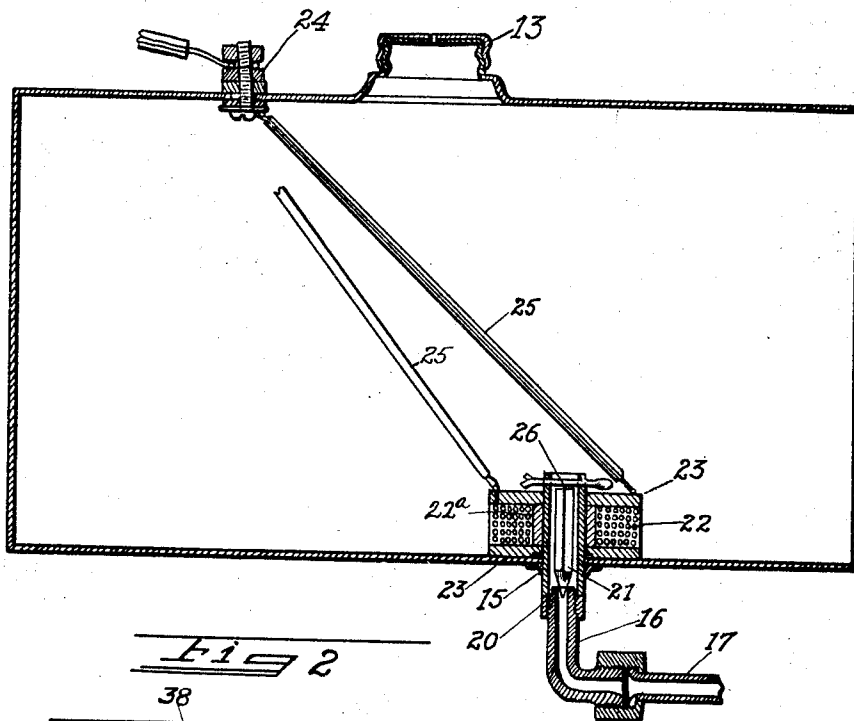
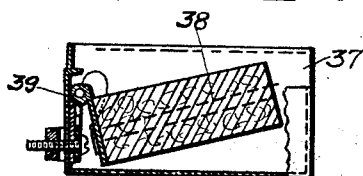
J. E. W. ROSSON

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LUBRICATING DEVICE FOR INTERNAL COMBUSTION ENGINES

Filed Oct. 23, 1924

2 Sheets-Sheet 1



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James E. W. Rosson
BY Allen & Allen
ATTORNEYS

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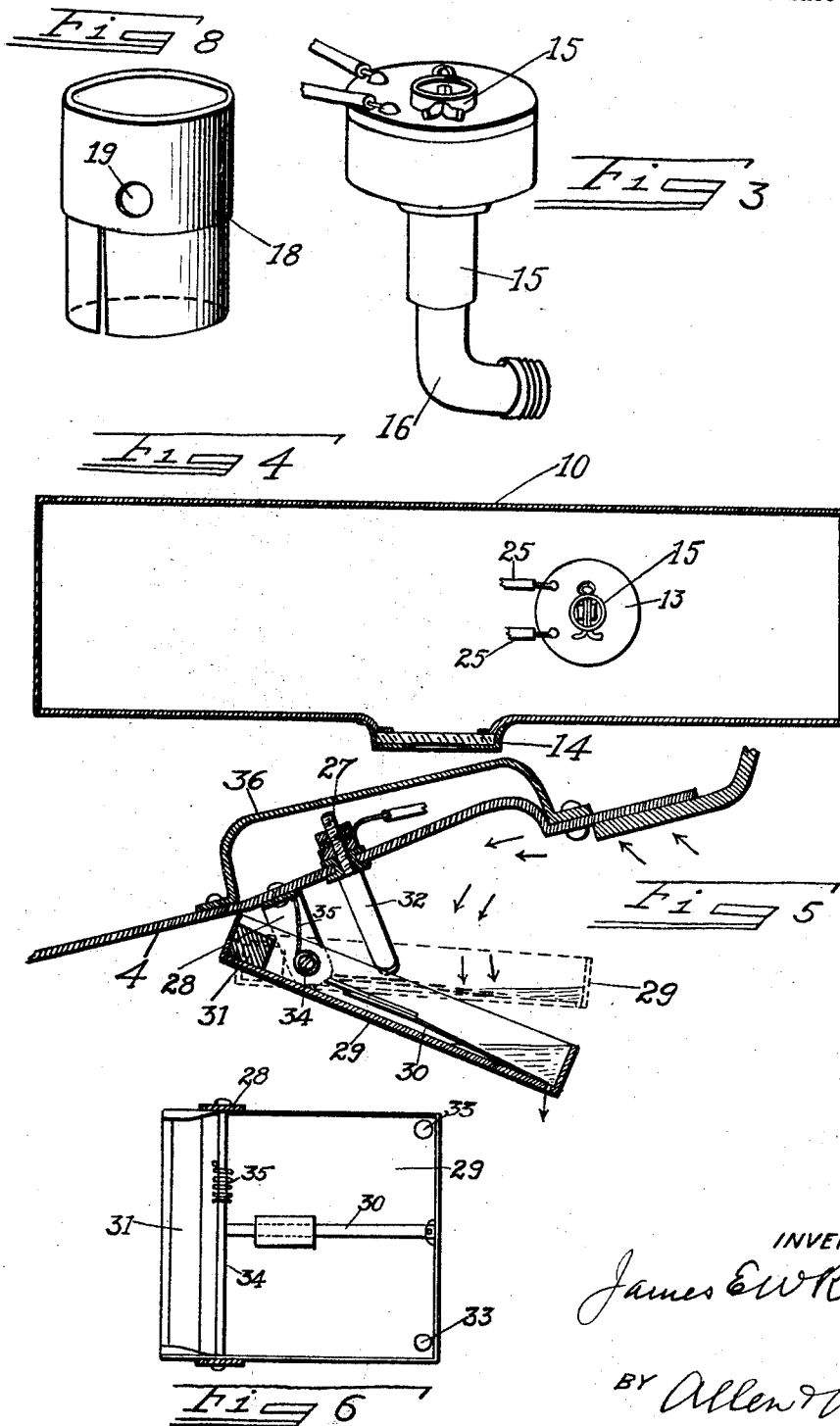
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LUBRICATING DEVICE FOR INTERNAL COMBUSTION ENGINES

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INVENTOR

James E. W. Rossion

BY Allen & Allen

ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES E. W. ROSSON, OF HOPKINSVILLE, KENTUCKY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO GISH COMPANY, INC., OF LOUISVILLE, KENTUCKY, A CORPORATION OF KENTUCKY.

LUBRICATING DEVICE FOR INTERNAL-COMBUSTION ENGINES.

Application filed October 23, 1924. Serial No. 745,436.

My invention relates to devices for maintaining the oil level in the crank cases of internal combustion engines, and it is particularly designed for use in connection with the engines of Ford automobiles in which type of engine it is of especial importance that the supply of oil in the main sump be maintained at a constant level and that a small quantity of oil shall be continuously added to take the place of the small portions which are continuously used during the running of the car.

In internal combustion engines to which my invention is particularly applicable, the oil supply is distributed to the engine parts by the rotation of the fly wheel or other rotatable member and the oil supply should be maintained at a height in the casing to permit the distribution by centrifugal action of the rotating part and as soon as the rotating member ceases to distribute a predetermined amount of oil the supply should be renewed; a comparatively small amount of oil constantly renewed is obviously all that is required to maintain proper lubrication.

Instead of endeavoring to determine the height of the oil in the casing by means of a float or other device operating in the oil, which is frequently impracticable by reason of the narrow space between the rotating member and the bottom of the casing, and utilizing this float or the height of the oil in the casing to open the oil tank for an additional supply, I have adopted a certain novel construction and arrangement of parts in which the oil tank is closed by a valve electro-magnetically operated to open the supply the moment the rotating member fails to throw the oil to the top of the casing, which novel construction and arrangement of parts will be hereinafter more particularly pointed out and claimed.

In the drawings.

Figure 1 is a perspective view of the casing of a type of Ford gasoline engine with my lubricating device attached.

Figure 2 is a central vertical section of the oil supply tank.

Figure 3 is a perspective view of the solenoid for operating the oil supply valve.

Figure 4 is a horizontal section of the oil tank.

Figure 5 is a detail section taken through the cover plate of the transmission casing showing the automatic device or circuit breaker for operating the solenoid.

Figure 6 is a top plan view of the automatic device or circuit breaker removed from the cover.

Figure 7 is a cross section of a modified form for controlling the solenoid.

Figure 8 is a perspective view of the coupling for the oil supply tube.

I have illustrated in the drawings a perspective view of a type of Ford automobile engine casing 1 with the fly wheel casing 2 and the transmission casing 3 adjacent the fly wheel casing, provided with a cover 4. The engine casing is in the ordinary construction supplied with lubricating oil through an opening at 5 provided with a cap 6 and the oil runs down into the fly wheel casing whence it is distributed by the centrifugal action of the fly wheel rotating in the oil. A drainage plug 7 is provided for this casing with two gauge cocks 8 and 9, by which the height of oil in the casing is determined, and between which the oil level is ordinarily to be maintained. With this construction there is no way of determining the amount of oil except crawling under the machine and testing the height through these gauge cocks. If the oil is consumed below the level of the lower gauge cock, great harm may be done by running without oil, too much may easily be added to be wasted and burnt up in the form of smoke, fouling spark plugs, and carbonizing the cylinder.

It is the object of my invention to maintain the oil level automatically, for proper distribution of the oil by the fly wheel, supplying the exact amount of oil for continuous distribution.

To accomplish this, I employ the distribution as the test. When the fly wheel ceases to distribute oil to the top of the casing as it should, an oil valve in an oil tank or reservoir is automatically opened and oil supplied to the casing until proper distribution again commences, when the oil valve is automatically closed, so that under all running conditions, the proper amount of oil is maintained, neither too much nor too little.

To accomplish this, I provide an oil tank or reservoir 10 preferably rectangular in shape and of narrow width which is secured to the side of the engine casing by metal straps

5 12. This tank is provided with a filling opening closed by a cap 13 with an air hole therein to supply air. The tank is provided with a glass gauge 14 and the location of the tank on the side of the engine casing adjacent to exhaust manifold not only warms the oil for proper flow in cold weather, but the location is such that the gauge can be inspected through the air ventilators of the hood without raising the hood and the user can tell whether he has a sufficient supply of oil on hand at a moment's glance.

The oil is automatically supplied to the casing through the pipe 15, in the bottom of the tank, provided with an elbow coupling

20 16. The elbow is connected by a short tube 17 to the supply opening 5 of the engine casing.

In order that this connection can be made without drilling any holes and at a moment's notice, I provide the sleeve 18 shown in Figure 8 and the cap 6 is removed, the sleeve inserted and the tube 17 passed through the opening 19 and the cap replaced. The inner end of the elbow coupling 16 is provided with a valve seat 20 upon which is seated a needle valve 21 with a heavy metal stem, so that the valve seats by gravity. Surrounding the pipe 15 inside of the tank is a solenoid winding of fine wire 22 of which the shank of the valve 21 forms the core. This wire is wound on a fibre core 22^a with fibre disks 23 at top and bottom so as to prevent any metal contact to avoid accidental short circuit and the ends of the coil properly encased are connected with insulated binding posts 24 on top of the oil tank by the wires 25.

Normally the oil valve 21 will remain closed by its own weight. When a current of electricity is passed through the solenoid winding, the valve is lifted from its seat to allow oil to discharge. To serve as a stop for the valve, I pass a cotterpin 26 through the top of the pipe 15. The current for the solenoid is obtained by connection with the magneto or from the generator by connection between the generator and the relay, so that when the car stops no current is furnished.

55 One of the wires 25 is connected with the metal casing and the other wire with a binding post 27, on the cover plate 4 of the transmission casing near the fly wheel casing. This binding post is provided with an inwardly projecting metal pin 32. Pivotaly mounted in a bracket 28 secured to the undersurface of the cover plate on the pintle 34 is a tray or bucket 29 which is provided with a resilient copper contact strip 30 and a weight 31 tends to bring the con-

tact strip into connection with the pin. When this contact takes place the current is passed through the solenoid and the oil valve is lifted to allow oil to discharge from the tank into the fly wheel casing.

The bucket 29 is, however, located at the top of the casing and as long as there is sufficient oil in the casing, it is thrown by the wheel to the top and some of this oil is caught by and fills the bucket causing it to tip outwardly as shown in the full lines in Figure 5. It follows that as long as there is oil to be distributed the contact between the pin 32 and the strip 30 will be broken and the oil valve 21 will remain closed. The bucket is provided with two holes 33 to allow the oil to discharge from the bucket as it is constantly filled by the oil thrown up by the fly wheel. When no oil is supplied the bucket at once tips back into the position shown by dotted lines in Figure 5 and contact is made. In order that vibration of the bucket may not make and break the circuit, the strip 30 is made resilient so that connection is maintained under any vibration. To insure a proper circuit from the strip 30 to the engine casing, I have shown the pintle 34 upon which the bucket is pivoted as connected by wire 35 with the cover plate.

To prevent the floor boards of the car from pressing down upon the binding post and wire, I protect this connection by a strap 36.

Instead of a pivoted bucket or tray to make and break the solenoid connection, I can provide a fixed bucket 37 secured to the cover 4, and provide a cork float 38 to make and break the electrical connection as shown in Figure 7. As this bucket fills the cork will float and break the connection at 39 and as the oil runs out through holes in the bottom as in the preferred construction without oil being constantly filled therein, the cork float will drop down and make the necessary connection.

While I have illustrated my invention with special reference to the construction as found in the standard Ford machine, it is obvious that it may be applied to any type of construction in which the oil as distributed is thrown to the top of the casing, there to be caught by any form of tray or bucket which when oil is filled into it will effect a breaking of an electric circuit and which when empty shall close the circuit through an electro-magnet controlling a valve member in an oil reservoir. I, therefore, do not desire to be in any way limited to the specific details shown.

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

1. In a lubricating device of the character specified, the combination with a recep-

tacle in the engine casing for holding the lubricant and a rotating member to distribute the lubricant throughout the casing, of an oil supply reservoir for supplying lubricant to the casing, a valve in the oil supply line normally closed, and an electro-magnet adapted when energized to open said valve and means actuated upon the failure of the oil distribution to close the current when the oil distribution ceases.

2. In a lubricating device of the character specified, the combination with a receptacle in the engine casing for holding the lubricant and a rotating member to distribute the lubricant throughout the casing, of an oil supply reservoir for supplying lubricant to the casing, a valve in the oil supply line normally closed, and an electro-magnet adapted when energized to open said valve and means located in the upper portion of the engine casing actuated upon the failure of the oil distribution to maintain an open circuit during oil distribution and to close the circuit when oil distribution ceases.

3. In a lubricating device of the character specified, the combination with a receptacle in the engine casing for holding the lubricant and a rotating member to distribute the lubricant throughout the casing, of an oil supply reservoir for supplying lubricant to the casing, a valve in the oil supply line normally closed, and an electro-magnet adapted when energized to open said valve, and a pivoted member located in the upper portion of the engine casing actuated upon the failure of the oil distribution to open the electro-magnetic circuit and adapted to close the circuit when oil distribution ceases.

4. In a lubricating device of the character specified, the combination with an engine casing for holding the lubricant and a rotating member to distribute the lubricant throughout the casing, of an oil supply reservoir for supplying lubricant to the casing, a valve in the oil supply line normally closed, and an electro-magnet adapted when energized to open said valve, and an oil tray carrying a contact member in the upper portion of the engine casing, the tray adapted to catch the oil, with means for breaking the electric circuit when oil is fill-

ing the tray and for closing the circuit when the oil tray is discharged.

5. In a lubricating device of the character specified, the combination with an engine casing for holding the lubricant and a rotating member to distribute the lubricant throughout the casing, of an oil supply reservoir for supplying lubricant to the casing, a valve in the oil supply line normally closed, and an electro-magnet adapted when energized to open said valve, and an oil tray carrying a contact member in the upper portion of the engine casing, with pivot for the tray to permit the tray to tip when receiving oil distributed by the rotating member and to open the circuit to the electro-magnet and means for lifting the tray to close the circuit when oil is not received by the tray.

6. In a lubricating device of the character specified, the combination with an engine casing having a receptacle for the distribution of oil, and a fly wheel rotating in said receptacle, of an oil supply reservoir located above the receptacle with a supply line to deliver oil from the reservoir to the receptacle, a metal needle valve in said supply line normally closed and a solenoid coil to lift the metal valve from its seat, an oil tray in the upper part of the casing above said receptacle with means for closing the solenoid circuit when said tray is filled with oil, and to open the circuit when no oil is being distributed.

7. In a lubricating device of the character specified, the combination with an engine casing having a receptacle for the distribution of oil, and a fly wheel rotating in said receptacle, of an oil supply reservoir located above the receptacle with a supply line to deliver oil from the reservoir to the receptacle, a metal needle valve in said supply line normally closed and a solenoid coil to lift the metal valve from its seat, an oil tray pivoted in the upper part of the casing adapted to tip when filled, with an electric circuit through said tray, adapted to be opened when oil is discharged into said tray and to close when no oil is being received by the tray.

JAMES E. W. ROSSON.