

June 19, 1928.

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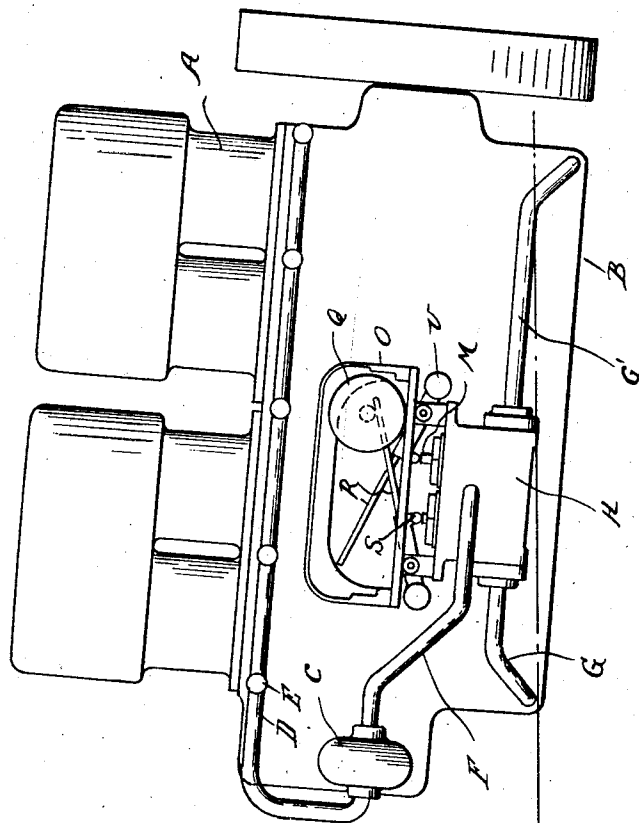
E. FREDERICK

ENGINE LUBRICATING SYSTEM

Filed Dec. 7, 1925

2 Sheets-Sheet 1

Fig. 1.



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Fig. 3.

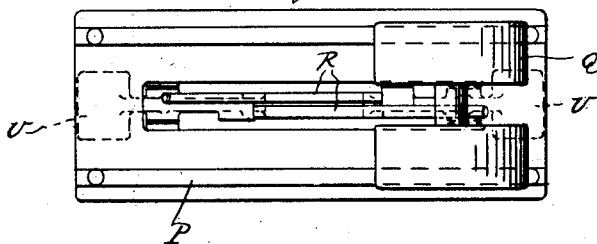
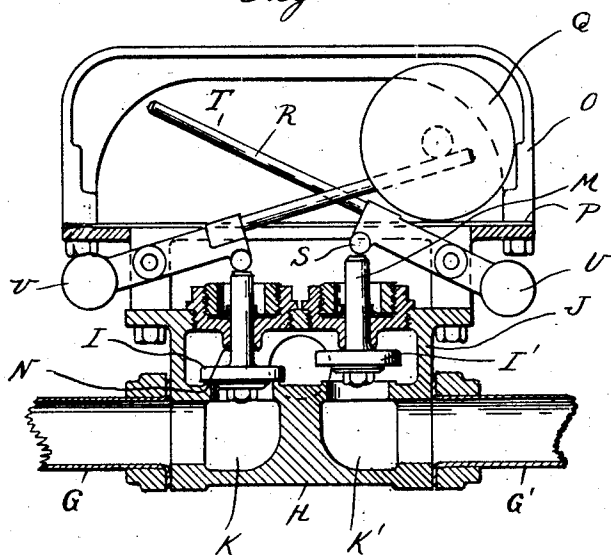


Fig. 2.



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UNITED STATES PATENT OFFICE.

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ENGINE-LUBRICATING SYSTEM.

Application filed December 7, 1925. Serial No. 73,846.

The invention relates to lubricating systems for engines designed for use on motor vehicles, aeroplanes and other places where subject to change in inclination. It is usual in such lubricating systems to hold the lubricant in a sump in the bottom of the pan or casing from which it is drawn by the suction of a pump and distributed to the various bearings to be lubricated, finally returning by gravity to the sump. With multi-cylinder engines, where the oil sump extends under all of the cylinders, there may be considerable difference in the elevation of the opposite ends thereof. Consequently the suction conduit if located at either end of the sump may become unsealed thereby stopping the circulation of the lubricant. On the other hand, if the sump does not extend beneath all of the cylinders there may be difficulty in draining the lubricant thereto. I have, therefore, devised a construction of suction connection for the pump which has a plurality of inlets spaced from each other together with automatically operated means for alternatively cutting off said connections upon the tilting of the engine.

More specifically my improvement comprises a suction connection having two branches leading respectively to the opposite ends of the oil pan or sump together with valve means operated by the tilting of the engine for opening the lower connection and closing the upper one. The invention further consists in the novel construction of means for operating the automatic valve as hereinafter set forth.

In the drawings:

Figure 1 is a side elevation of a multi-cylinder engine to which my improvement is applied.

Figure 2 is a longitudinal section through the valve and operating mechanism therefor.

Figure 3 is a plan view.

A is a multi-cylinder engine having arranged in the bottom portion thereof, the oil pan or sump B extending the entire length beneath the cylinders. C is an oil pump for delivering lubricant through a conduit D and the plurality of outlets E corresponding to the several cylinders. The pump C has a suction conduit F which is provided with two branches G and G' leading to the opposite ends of the sump B. The connection between these branches and the

main suction conduit is automatically controlled by mechanism of the following construction;

H is a casing containing a pair of valves I and I' which control the ports leading from the main suction chamber J to the passages K and K' connected respectively with the branches G and G'. The valves I and I' as shown are of poppet type being provided with stems M which slidably engage bearings N in the casing. Above the casing H is a frame O having a track P for a roller weight Q. R are levers pivotally secured to the frame having bearing portions S for respectively contacting with the stems M and extensions T which lie in the path of the roller weight Q. The arrangement is such that when the engine is tilted the track P will be inclined permitting the roller weight to roll down the same and in so doing to operate one of the levers R to close the valve corresponding thereto while at the same time releasing the other lever and permitting its valve to open. The lever R may be counterweighted as indicated at U so as to withdraw the bearing on the valve stem whenever released by the roller weight Q.

With the construction as described when in operation the engine is inclined, the roller weight will travel down the inclined track releasing one of the levers R and applying pressure to the opposite lever R which through its bearing upon the valve stem will force the valve to its seat. The weight of the member Q is sufficient to hold the valve to its seat against any suction pressure that may be developed by the opening of the valve.

While one valve is thus forced to its seat the roller is withdrawn from contacting with the lever operating the other valve and the counterweight U of said lever will automatically withdraw it from its bearing on the valve stem. Thus freed, the valve may be opened by suction so that all the lubricant will be drawn through that branch which is connected with the deep end of the oil sump.

It is obvious that if the direction of tilting is reversed the roller weight Q will travel in the opposite direction which will close the branch previously opened and will open the branch previously closed.

What I claim as my invention is:

1. In an engine lubricating system, the combination with an engine casing having

an oil sump in the bottom thereof, of a suction conduit having two branches connected with said sump at spaced points, a valve in each branch, a lever for each valve operable to close the same, and means movable by gravity into selective engagement with the said levers for alternatively closing the said valves.

2. In an engine lubricating system, the combination with an engine casing having an oil sump in the bottom thereof, of a suction conduit having two branches connected with said sump at spaced points, valves for controlling the respective branches, a roller weight, a track for said weight normally horizontal but inclined when said casing is tilted, and means extending from said valves into the path of said roller weight whereby the tilting of said casing in either direction will close the valve for the raised end of the sump and open the valve for the depressed end thereof.

3. In an engine lubricating system, the combination with an engine casing having an oil sump in the bottom thereof, of a suction conduit having two branches connected with said sump at spaced points, valves for controlling the respective branches adapted to be opened by suction, a roller weight, a track for said roller weight normally horizontal when the casing is level but inclined when the casing is tilted, levers for actuating said valves extending into the path of said roller weight whereby the valve for the raised end of the sump will be closed by said

lever and weight and the valve for the depressed end of the sump will be released.

4. In an engine lubricating system, the combination with an engine casing having an oil sump in the bottom thereof, of a suction conduit having two branches connected with said sump at spaced points, valves for the respective branches adapted to be opened by suction and having vertically extending operating stems, a roller weight, a track on which said weight rolls, being normally horizontal when the casing is level and inclined when the casing is tilted, levers for operating said valve stem having oppositely inclined arms extending into the path of said roller weight respectively when the latter is at opposite ends of the track whereby on the tilting of the casing the valve for the raised end of the sump will be closed by said weight and the valve for the depressed end of the sump released.

5. In an engine lubricating system, in combination an oil sump, a suction conduit, a plurality of valves controlling the communication of the suction conduit with the oil sump, a member movable by gravity along a predetermined path, and a plurality of levers for actuating the said valves, the said levers projecting into the path of the movable member and being adapted to be selectively actuated thereby.

In testimony whereof I affix my signature.

EDMUND FREDERICK.