

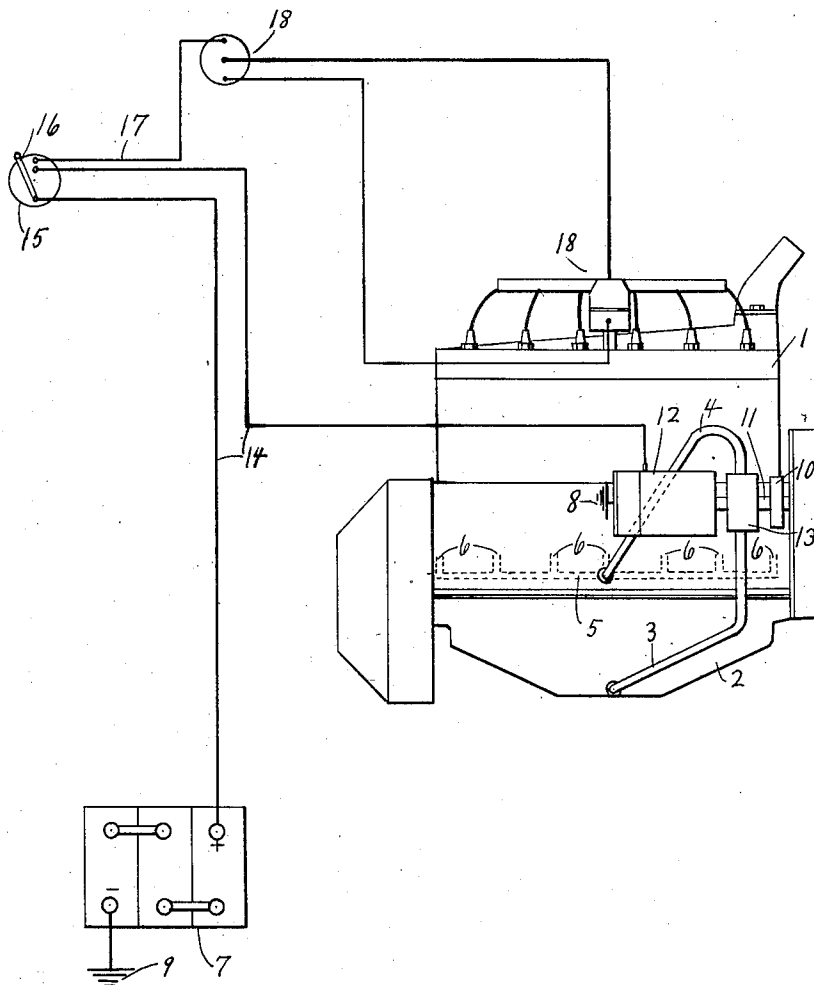
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PUMPING SYSTEM

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PUMPING SYSTEM

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This invention relates to a pumping system more particularly for supplying lubricating oil to the bearings of internal combustion engines in motor vehicles.

5 According to the usual practice internal combustion engines of motor vehicles are provided with a reservoir containing a quantity of lubricating oil and the lubrication of the engine is effected by circulating the oil to the various bearing surfaces by a means dependent upon being 10 ing surfaces by a means dependent upon being actuated by the engine. When the engine is stopped the bearing surfaces as well as the oil thereon is usually warm or hot which causes the oil to drain from the bearings to such an extent 15 that when the engine is started there is insufficient oil remaining to effectively lubricate the parts which results in rapid wear of the bearing surfaces which continues until the engine has actuated the oil circulating means sufficiently to 20 cause oil to reach the bearings. This wear during the starting period constitutes a large proportion of the total wear.

One of the objects of this invention, therefore, is to provide a pumping system adapted to operate with the engine mechanism at rest so that 25 lubricating oil may be supplied to the bearing surfaces before the engine mechanism is put in motion to reduce wear during the starting period.

Another object of this invention is to provide 30 means whereby the pumping system automatically functions when the engine ignition switch is turned on.

Another object of this invention is to provide a pumping system whereby the pump is driven by 35 engine power when the engine is running above a certain speed and said pump driven by energy furnished by the usual motor vehicle battery with the engine at rest.

Another object is to provide means whereby 40 the usual motor vehicle generator performs its usual function of generating electrical energy when the engine is running at a sufficient speed and said generator operating as a motor to drive the pump with the engine at rest.

Other objects and features of novelty will be 45 in part obvious and in part will appear during the course of the following description.

In the accompanying drawing, the single figure is a side elevation, more or less diagrammatic in 50 form, of an internal combustion engine having my invention applied thereto.

In the accompanying drawing the numeral 1 indicates an internal combustion engine having 55 a lower casing 2 used as a reservoir for storing oil with which the engine is lubricated. The oil

is drawn from the casing 2 and supplied to the various bearings of the engine by a pump 13, as shown, connected on its intake side to pipe 3, the end of which connects to the lower part of the casing 2; and on its outlet side said pump 60 is connected to the pipe 4 which makes connection with a passage 5 from which branches 6 lead to the various bearings to be lubricated. The pump 13 which may be of any usual or suitable construction together with a generator 12 which 65 may be of any usual or suitable construction, are driven through the overrunning clutch 10 and shaft 11 from the engine 1.

A manually operative switch 15 is embraced in the circuit 14, and has connection with a circuit 70 17, and operates to simultaneously close or open the circuit 14 and circuit 17 by a contact member 16. The circuit 14 is in series with generator 12, ground connections 8 and 9, and battery 7. Circuit 17 supplies electrical energy to ignition sys- 75 tem 18.

The ground connections 8 and 9 indicate a conductor to complete the circuits. It is apparent that such method of connecting the units is immaterial to the invention and that other than 80 a ground circuit could be used.

The operation of the herein described embodiment of my invention is substantially as follows:

When it is desired to start the engine 1 the manually operative switch 15 is closed which 85 serves as the usual ignition switch.

Upon closing the switch 15, the circuit 14 is closed and connection is made between the circuit 14 and circuit 17. And when the engine 1 is at rest current flows from battery 7 through circuit 90 14 to the generator 12 from which the circuit is completed by ground connections 8 and 9. Incidentally current flows into the ignition system 18 through circuit 17.

The current flowing through the generator 12, 95 causes it to operate as a motor and by reason of the overrunning clutch 10, free rotation and driving of the pump 13 is allowed with the engine 1 at rest. Thus pump 13 draws oil through pipe 3 from casing 2 and delivers it through pipe 4, 100 passage 5 and branches 6 to the various parts of the engine to be lubricated with the engine at rest.

When the engine is started or rotating at a sufficient speed, the overrunning clutch 10 en- 105 gages and completes the driving connections from the engine to the pump 13 and generator 12. As the engine 1 begins to drive the pump 13 and generator 12, the increased counter-electromotive force generated by the generator 12 diminishes 110

the current flowing thereto. The current being diminished to zero as the rotative speed of the engine increases, whereupon further increase in the rotative speed of the engine causes the generator 12 to generate an electromotive force higher than that of the battery 7. The electromotive force of the generator 12 being above that of the battery 7 results in the flow of current in the circuit 14 being reversed. The current now being delivered by the generator 12, and flowing therefrom through circuit 14 to the battery 7 from which the circuit is completed by ground connections 9 and 8. Thus the battery 7 is charged as usual. And the generator 12 also furnishes current for the ignition system 18 through circuit 17 which has connection to circuit 14 through switch 15.

It will be understood that the particular embodiment of the invention disclosed herein is merely illustrative, for it will be obvious that various changes in form, construction and arrangements of parts may be made without departing from the spirit and scope of my invention, which is as set forth in the appended claims.

I claim:

1. The combination with an internal combustion engine, of a lubricant circulating system therefor, means to circulate the lubricant through said system actuated by said engine, and means to circulate the lubricant through said system with said engine at rest.

2. The combination with an internal combustion engine, of a lubricant circulating system therefor, means to circulate the lubricant through said system actuated by said engine, and means to actuate said circulating means with said engine at rest.

3. The combination with an internal combustion engine, of a fluid circulating system therefor, means to circulate the fluid through said system actuated by said engine, means to actuate said circulating means with said engine at rest, and manually operative means adapted to simultaneously control the operation of said actuating means and the operation of said engine.

4. The combination with an internal combustion engine, of a fluid circulating system therefor, means to circulate the fluid through said system actuated by said engine, a source of stored power, means to actuate said circulating means operated therefrom, said actuating means arranged to be actuated by said engine and adapted to deliver power to said source, and means adapted to allow the said circulating means to be actuated with said engine at rest.

5. The combination with an internal combustion engine, of a fluid circulating system for said engine, means to circulate the fluid through said system actuated by said engine, a device adapted to operate either as a generator or as a motor and in driving connection with said engine and said circulating means, and means adapted to automatically disengage and allow said device to actuate said circulating means with said engine at rest.

6. The combination with an internal combustion engine, of a fluid circulating system for said engine, means to circulate the fluid through said system actuated by said engine, a mechanism

adapted to operate either as a generator or as a motor and in driving connection with said engine and said circulating means, and a clutch adapted to disengage and allow said mechanism to actuate said circulating means with said engine at rest.

7. The combination with an internal combustion engine, of a lubricating system for said engine, a pump of said system driven by said engine, a generator driven by said engine and adapted to operate as a motor and in driving connection with said pump, and a clutch adapted to disengage and allow said generator to drive said pump with said engine at rest.

8. The combination with an internal combustion engine, of a lubricating system for said engine, a pump to circulate lubricant through said system driven by said engine, a generator driven by said engine and adapted to operate as a motor and having driving connection with said pump, an overrunning clutch in the line of drive between said engine and said pump and between said engine and said generator, a storage battery in circuit with said generator, and a manually operative switch mechanism adapted to simultaneously control said circuit and a circuit to an ignition system.

9. The combination with an internal combustion engine, of a pump driven by said engine, a generator driven by said engine and adapted to operate as a motor and in driving connection with said pump, a clutch adapted to disconnect said engine from said pump and said generator for the said generator to drive said pump with said engine at rest, a storage battery in circuit with said generator, an ignition circuit, and a manually operative switch adapted to simultaneously control the two said circuits.

10. The combination with an internal combustion engine, of a pump driven by said engine, an oil reservoir, a conduit connecting said pump and said reservoir, a conduit connected to said pump and leading to the various parts of said engine to be lubricated, a generator driven by said engine and adapted to operate as a motor and in driving connection with said pump, an overrunning clutch adapted to disconnect said engine from said pump and said generator for the said generator to drive said pump with said engine at rest, a storage battery in circuit with said generator, an ignition circuit, and a manually operative switch adapted to simultaneously close or open the two said circuits.

11. In combination, a pump, an electric generator adapted to operate as a motor and arranged to drive said pump, means for driving said pump and said generator, and an overrunning clutch in said means.

12. In combination, a pump, an electric generator adapted to operate as a motor, driving means for driving said pump from said generator, means for driving said pump and said generator, an overrunning clutch in said means, a storage battery, a circuit connecting said generator and said battery, an ignition circuit, and a manually operative switch adapted to simultaneously close or open the two said circuits.

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