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AUTOMATIC ENGINE STOPPING MEANS

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1 Claim. (Cl. 123—146.5)

The invention aims to provide new and improved means for automatically stopping an internal combustion engine in case the quantity of lubricating oil therein has diminished to a dangerous degree, from any cause, and it aims further to provide such a relation of elements that no manual operations are necessary to re-condition the ignition circuit for motor operation, after replenishing the oil supply.

A still further object is the provision of means which positively breaks the ignition circuit to stop the motor when the supply of oil is low.

With the foregoing in view, the invention resides in the novel subject matter hereinafter described and claimed, description being accomplished by reference to the accompanying drawing, in which the figure is a diagrammatic sectional view showing the invention.

While the invention is intended primarily for use upon automobiles, it is adaptable also to stationary internal combustion engines. A conventional battery 1 is shown for the ignition circuit of the engine, said circuit embodying, in the present disclosure, the wiring 2, 3, 4, and 5, the conventional manually controlled ignition switch 6, and a second normally closed switch 7. I have shown this switch 7 within an insulating housing 8 and pivoted at 9 to a binding post 10 with which the wire 3 is connected, said switch 7 being normally held by a spring 11 against a contact 12 on the inner end of a second binding post 13, the latter being connected with the wire 4. An electro-magnet 14 is mounted within the casing 8 for opening the switch 7, thereby positively breaking the ignition circuit and stopping the motor, when the lubricating oil in said motor has diminished to a dangerous extent. A circuit for the electro-magnet 14 is provided, said circuit being preferably shunted from the ignition circuit. This shunt circuit embodies switch 6 but not switch 7, and it also includes a normally open, self-closing switch 15 which is co-operable with two contacts 16 and 17, and pressure-held means such as a plunger 18 subjected to the pressure within the oil-circulating line 19' of the motor, is employed for normally holding said switch 15 against closing. Coil springs 19 are illustrated for moving the switch 15 into engagement with the contacts 16 and 17 when decrease of pressure in the line 19 allows the plunger 18 to move inwardly. The wiring of the shunt circuit may well be as illustrated. A wire 20 is shown leading from the binding post 10 to the electro-magnet 14, and wiring 21 leads from said electro-magnet to a binding post 22

carrying the contact 17. A wire 23 extends to the wire 5 from a binding post 24 which carries the contact 16.

As long as the motor is operating and contains a proper quantity of lubricating oil, switch 7 remains closed, switch 15 remains open, and the current for the ignition circuit travels as shown by the full line arrows. As soon as the oil pressure recedes sufficiently from any cause however, the springs 19 move the switch 15 into engagement with the contacts 16 and 17, whereupon the current travels as shown by the dotted arrows, said current energizing the electro-magnet 14 and causing the latter to open the switch 7, thereby positively breaking the ignition circuit and stopping the motor.

I preferably provide an additional shunt circuit for a tell-tale light 25 disposed at any desired, conspicuous location, said shunt circuit being branched from the circuit of the electro-magnet 14 and embodying the switch 6. In the present showing, a wire 26 connects one terminal of this light with the wire 3 and another wire 27 connects the other terminal of said light with the wire 21. Thus, as soon as the electro-magnet 14 is energized to stop the motor, the tell-tale light 25 is illuminated, notifying the operator that the motor has stopped from either lack of oil or lack of proper oil pressure. Consequently, the ignition switch 6 is opened and the trouble rectified. As soon as switch 6 is opened, the electro-magnet 14 becomes de-energized and consequently the switch 7 is again closed by the spring 11, the switch 15 remaining at that time closed. Opening of switch 6 also extinguishes the tell-tale 25. When the motor is to be re-started, the ignition switch 6 is first closed, and as the switch 15 is then also closed, the electro-magnet 14 will be energized and will open the switch 7. Even though this switch is in the ignition circuit, it will not interfere with re-starting of the motor, for as soon as said motor is turned over with the usual self-starter or even by hand, the oil pump again builds up pressure and opens the switch 15, immediately de-energizing the electro-magnet 14 and causing the switch 7 to again close, completing the ignition circuit.

Even if there be proper supply of lubricating oil in the motor, the pressure will gradually leak from the oil line 19' when the motor is stopped by cutting off the ignition switch 6. Hence, the switch 15 will eventually close. It thus follows that when the switch 6 is again closed to start the motor, the electro-magnet 14 is energized and caused to open the switch 7. As soon as the motor

is turned over by the starter or otherwise however, the oil pressure again builds up, opening the switch 15 and causing the electro-magnet 14 to become de-energized, so that the switch 7 may
5 reclose, completing the ignition circuit.

It will be seen that novel and inexpensive provision has been made for carrying out the objects of the invention. Particular attention is invited to the fact that the ignition circuit is positively
10 broken to stop the motor. Attention is also invited to the fact that no manual operations are necessary to restore the ignition circuit to operative condition after the switch 15 has closed from any cause, the re-closing of said ignition
15 circuit when it is desired to re-start the motor, being carried out automatically.

While the wiring disclosed may be followed if desired, any other adequate wiring could of course be employed, and it is not essential that
20 a "two-wire" system be employed, for the invention could be used equally well with an ignition circuit having a ground return. Moreover, while it is probably preferable to hold the switch 15 open by the pressure of oil in the oil circulating
25 line leading from the usual pump, it is of course possible to obtain the same result by the use of a float.

I claim:—

In combination, an engine having an ignition circuit embodying a manually-actuated ignition switch and a second ignition switch of self-closing
80 form, the latter having an electro-magnet for opening it; a circuit for said electro-magnet branched from said ignition circuit and embodying said manually-actuated ignition switch but
85 not said second ignition switch, said circuit of said electro-magnet embodying a second self-closing switch, means controlled by the lubricating oil of the engine for holding said second self-closing switch open, a tell-tale, and a circuit for
90 said tell-tale branched from said electro-magnet circuit and embodying said manually-actuated ignition switch; whereby upon closing said manually-actuated switch the engine may be operated until diminished oil permits closing of said
95 second self-closing switch and the latter effects simultaneous opening of said second ignition switch and operation of said tell-tale, and whereby opening of said manually-actuated ignition switch will again cause closing of said second
100 ignition switch and discontinuance of said tell-tale, thereby discontinuing current consumption.

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