Feb. 20, 1940. C. MENDEZ 2,191,216

CIRCUIT CONTROLLER

Filed July 17, 1939

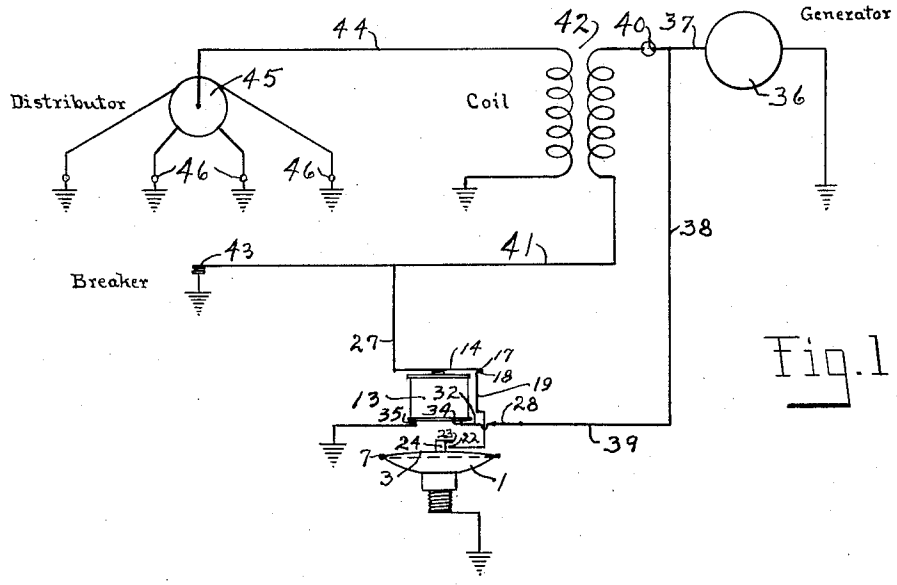


Fig.1

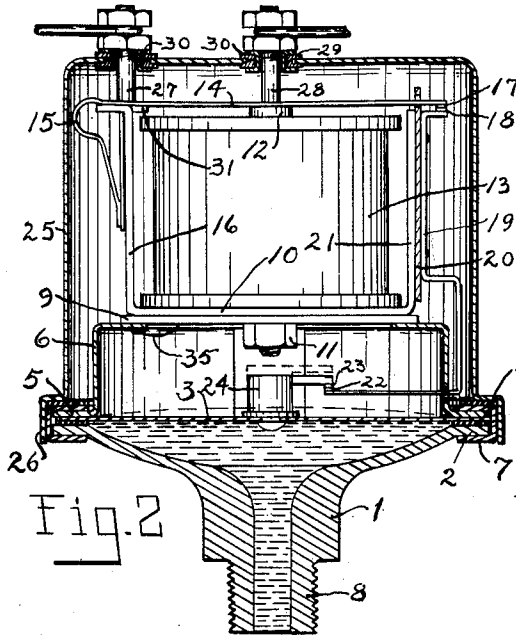


Fig.2

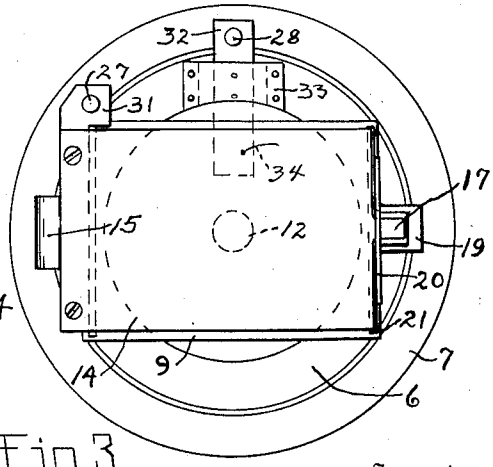


Fig.3

Inventor

Charlie Mendez

By Arthur Minnick

Attorney

Patented Feb. 20, 1940

2,191,216

UNITED STATES PATENT OFFICE

2,191,216

CIRCUIT CONTROLLER

Charlie Mendez, Tampa, Fla.

Application July 17, 1939, Serial No. 284,879

2 Claims. (Cl. 123—146.5)

This invention relates to a circuit controlling device for motor vehicles having for its primary purpose to short-circuit the ignition system whenever the oil pressure in the lubricating system falls below normal.

When a motor is in operation with an insufficient supply of oil to maintain proper lubrication of the bearings, great damage to the motor may occur before the operator becomes aware that anything is wrong. The loss of time, cost of repairs, and possible injury to the perishable cargo frequently carried by motor trucks which may occur when bearings are burnt out for lack of oil are cogent reasons for the use of efficient means for preventing such mishaps.

The present invention provides an automatic means for closing a circuit whenever during the operation of a motor the oil pressure falls below a predetermined amount. The circuit will normally be open to permit starting of the motor and to permit slow running, but any attempt to speed the motor will cause an immediate closing of the circuit and short-circuiting of the ignition system.

In the drawing illustrating a preferred embodiment of the invention, Figure 1 is a wiring diagram of the device; Fig. 2 is a central vertical section with parts in elevation of the circuit controller; and Fig. 3 is a plan view of the device with the cover removed.

As a means for providing a pressure chamber, a cup-shaped casing 1 is formed with a flange 2 to receive a flexible diaphragm 3. An oil-tight washer 4 is interposed between the flange 2 and the periphery of the diaphragm and superposed upon this periphery, is the flange 5 of a supporting member 6.

A collar 7, rolled or pressed into close contact with the flanges 2 and 5, serves to hold the assembly firmly together without the use of solder, though it will be evident that if it were found necessary or desirable, solder could be used to seal any joint that was defective. The casing 1 has a threaded stem 8 by which the chamber may be connected with the high pressure lubrication system of an internal combustion engine.

Upon the supporting member 6 is secured an insulator 9 on which is mounted a bracket member 10 which may be held upon the insulator by a nut 11 upon the lower end of a bolt 12 which forms the iron core for the coil 13 of an electromagnet which has an armature 14 carried by a spring hinge 15 secured upon an upright 16 of the bracket member 10. Upon the end of the armature remote from the hinge is a contact 17 adapted to engage a contact 18 on a conductor member 19 secured to an insulator 20 mounted on an upright 21 of the bracket member 10. The lower end of the conductor 19 has a contact 22 adapted to engage a contact 23 on a stud 24 mounted centrally on the upper surface of the diaphragm 3.

To protect this mechanism from dirt and injury, a cup-shaped cover 25 is provided having an annular flange 26 for engagement with the collar 7, and having on its upper surface or outer end two openings for the passage of members 27 and 28, which serve not only as securing means for the cover but also as conductors forming parts of two circuits, one through the coil 13 and the other through the armature 14. The members 27 and 28 are insulated from the cover by washers 29 of fiber held in place by eyelets 30. The member 27 is secured to a flange 31 on the upright 16 which is electrically connected with the armature. The member 28 is mounted on a conductor 32 secured to the insulator member 33 on the support 6.

The conductor 32 is secured to one terminal 34 of the wire upon the coil 13. The other terminal 35 of the wire upon the coil is secured to the support 6 which is electrically connected by the metallic collar 7 with the casing 1, which is grounded by screwing it into the oil system.

The wiring diagram of Fig. 1 indicates a generator 36 connected by wires 37, 38, and 39 to the conductor 28. The generator is also connected by wire 37 through a cut-out 40 to the primary winding of the coil 42 and thence by wire 41 to the breaker 43. The secondary winding of the coil 42 is connected by wire 44 with the distributor 45 serving the spark plugs 46.

The conductor 27 is also connected with wire 41.

With the engine at rest, no current flows from the generator and there is no pressure in the oil system sufficient to flex the diaphragm 3. The contacts 22 and 23 are together as shown in full lines in Fig. 2, but with the engine at rest, the contacts 17 and 18 are separated by the action of the spring 15. When the starter is actuated, the coil 42 will function in its normal manner and the motor will start to turn. Before the current through the coil 13 is strong enough to attract the armature to bring the contacts 17 and 18 together, the oil pressure in the lubricating system will cause the diaphragm 3 to flex to the broken line position in Fig. 2 to lift the stud 24 to separate contact 23 from contact 22 thus opening the circuit at two places.

The circuit through the wire 37, coil 42, wire 41

and conductor 27 is held open at contacts 17 and 18 by the action of the spring hinge 15 to permit starting, and then opened at contacts 22 and 23 to permit continued running of the motor after the contacts 17 and 18 have been brought together by the electromagnet.

If the oil pressure back of the diaphragm 3 becomes too low, from any cause, such as failure of the pump, leakage of oil, or other diminution of the supply, the diaphragm will move from the broken line position of Fig. 2 to the solid line position, bringing the contact 23 against the contact 22 to close the circuit 37, 42, 41, 27, 14, 17, 18, 19, 22, 23, 24, 3, 7, and 1 to the ground. With this circuit closed, the breaker 43 will not operate to break the circuit through the primary winding of the coil 42 and the secondary winding will not function to operate the spark plugs. This short-circuiting of the ignition system will cause an immediate slowing down of the motor to a point at which the current from the generator through the coil 13 will be reduced until the spring 15 will act to separate the contacts 17 and 18. The motor can then idle but any attempt to speed up the motor will cause the coil 13 to act to close the short circuit.

This slowing down of the operation of the motor will give the driver an immediate warning that the supply of oil must be replenished.

The closing of the short circuit could obviously be made to ring a bell, to light a lamp, or to actuate other warning signals in a manner familiar in the art, but the interruption of the ignition is preferred since it would automatically protect the motor even in cases where the attendant might be absent, as with stationary motors.

The device is inexpensive to construct, easy to attach, and highly efficient in use.

It will be evident that many changes in form, proportion, design, and arrangement of parts may be made without departure from the invention as claimed.

I claim:

1. In a circuit-controlling device for use across the ignition circuit of an internal combustion engine having a supply of oil under pressure, the combination of a casing connected with the oil pressure system and having a flexible diaphragm actuated by pressure in said system, a support secured to the casing, an electromagnetic coil upon the support having one terminal of the coil electrically connected with the casing, an insulator element secured to the support, a conductor mounted upon the insulator element and electrically connected with the other terminal of the coil, an armature for the coil carried by the said support and insulated therefrom, a conductor carried by said support and insulated therefrom, said conductor having a contact adjacent to the armature and the armature having a contact normally separated from the contact on said conductor when the coil is inoperative, a contact carried by the diaphragm and electrically connected with the casing, and a contact upon the conductor normally closed upon the contact on the diaphragm when the diaphragm is not flexed by pressure in the casing and separated therefrom when the diaphragm is flexed by pressure.

2. In a circuit-controlling device for use across the ignition circuit of an internal combustion engine having a supply of oil under pressure, the combination of a casing connected with the oil pressure system and having a flexible diaphragm actuated by pressure in said system, contacts interposed across the ignition circuit and arranged to be separated to open a circuit by expansion of the diaphragm under pressure and to be closed by contraction of the diaphragm when the pressure is lowered, other contacts in the same circuit and an electromagnetic coil having an armature arranged to separate the said contacts when the coil is inactive and to close the contact when the current through the coil is sufficient to actuate the armature.

CHARLIE MENDEZ.