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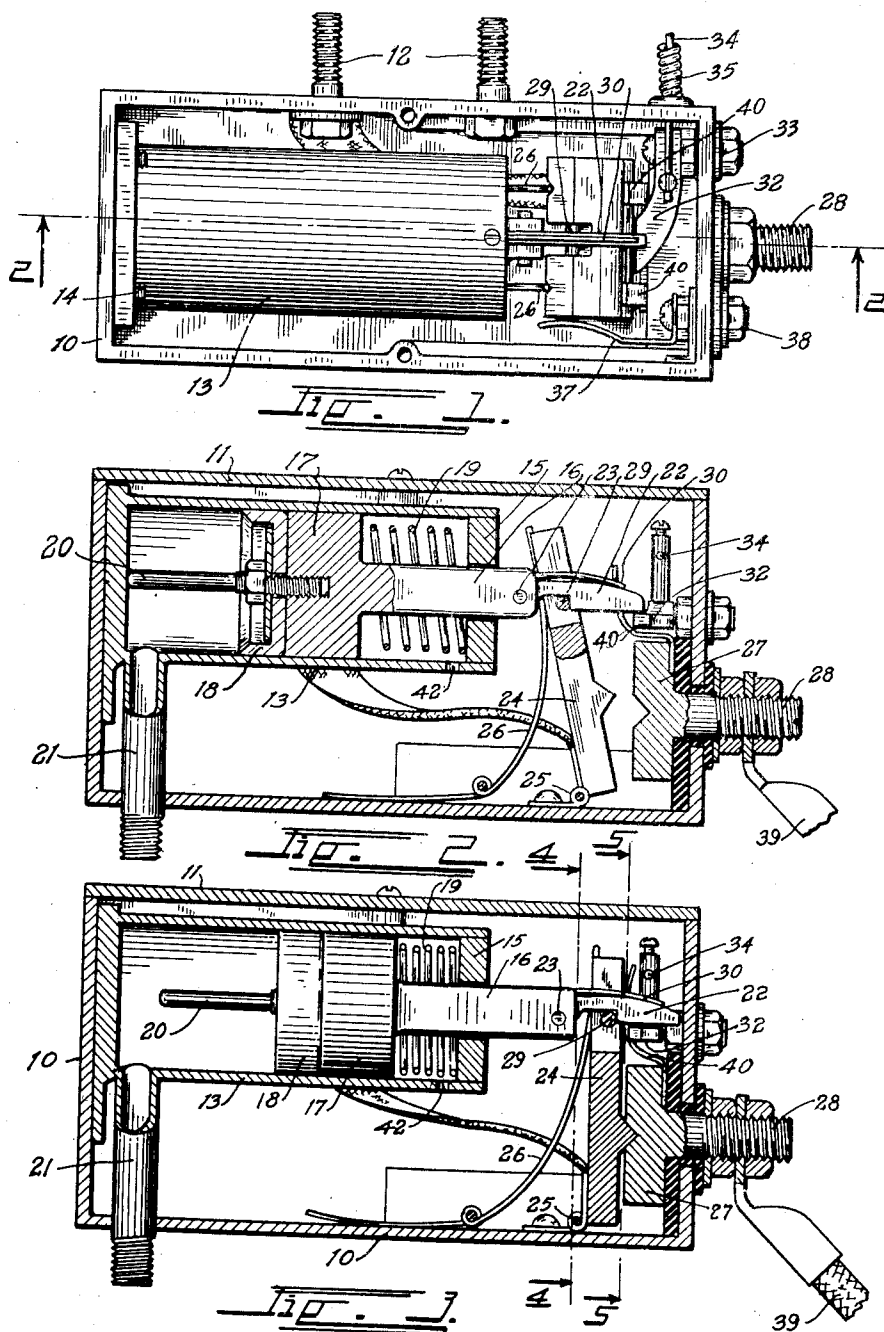
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2,096,291

SAFETY CONTROL FOR AUTO ENGINES

Filed Dec. 19, 1936

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

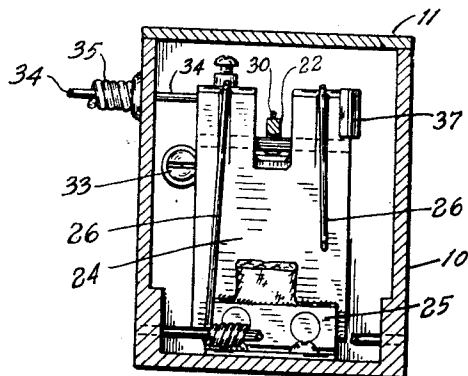


Fig. 4.

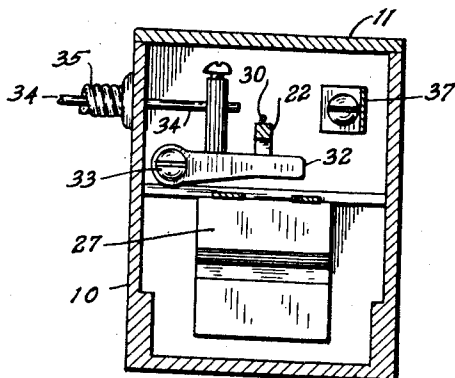


Fig. 5.

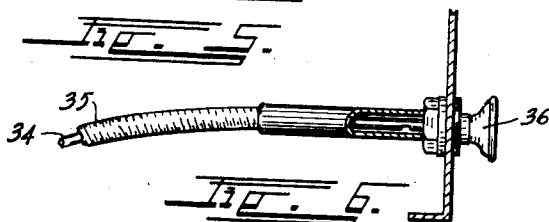


Fig. 6.

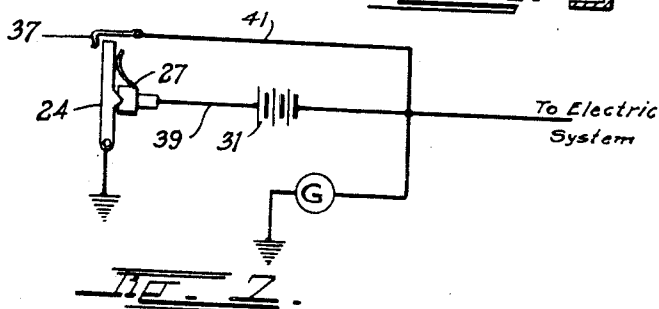


Fig. 7.

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UNITED STATES PATENT OFFICE

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SAFETY CONTROL FOR AUTO ENGINES

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6 Claims. (Cl. 244-32)

This invention relates to an automatic electric switch for automobiles and has for its principal object the provision of a mechanism which will shut off the entire electrical supply to the automobile and its engine in case of motor failure or other accidental cause; which will automatically stop the motor when the latter runs out of oil and prevent operation of the motor without oil; which will act as a theft lock to prevent unauthorized starting of the motor; and which will prevent accidental draining of the battery by the lights, radio, heater, ignition, etc., when the car is not in use.

Other objects and advantages reside in the detail construction of the invention, which is designed for simplicity, economy, and efficiency. These will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawings which form a part hereof. Like numerals refer to like parts in all views of the drawings and throughout the description.

In the drawings:—

Fig. 1 illustrates a plan view of the important automatic switch with the cover plate removed to show the interior construction.

Fig. 2 is a longitudinal section, thereof, taken on the line 2—2, Fig. 1, illustrating the switch in the open position.

Fig. 3 is a similar section illustrating the switch in the closed position.

Fig. 4 is a cross section, taken on the line 4—4, Fig. 3.

Fig. 5 is a similar cross section taken on the line 5—5, Fig. 3.

Fig. 6 is a detail view of the control handle.

Fig. 7 is a wiring diagram illustrating the circuit employed with the invention.

The invention is enclosed in a suitable metal case or housing 10, which may be closed by means of a suitable lid 11. The housing is provided with attachment bolts 12, by means of which it may be secured to any suitable metal part of the automobile.

Within the housing is a pressure cylinder 13 secured at one end by means of suitable attachment screws 14. The inner extremity of the cylinder 13 is closed by a cylinder head 15 formed with a square center opening for the passage of a square piston rod 16. The piston rod 16 projects from a piston 17 within the cylinder 13 and is sealed to the cylinder walls by means of a suitable cup washer 18. A compression spring 19 constantly urges the piston inwardly and a stop post 20 limits this inward movement of the piston.

Pressure is supplied to the cylinder 13 through a pressure pipe 21 which when in use is connected in the oil pressure line of the automobile.

The extremity of the piston rod 16 terminates in a latch member 22, which is hinged upon the piston extremity by means of a suitable hinge pin 23. A moveable switch arm 24 is hinged to the bottom of the housing 10, upon a suitable hinge 25, immediately ahead of the cylinder 13. A spring 26 acts to constantly force the switch arm 24 toward a switch contact 27 secured upon the extremity of the case 10.

The contact 27 terminates in an electrical contact lug 28, for receiving an electrical lead 39 from the battery to the ground. The moveable arm 24 is slotted for the passage of the latch 22 and carries a latch pin 29, over which the latch rides. A suitable leaf spring 30 presses the latch 22 downwardly against the pin 29.

The ground return lead 39 from the car battery, indicated at 31, is connected to the contact lug 28 and the case or housing 10 is grounded through the bolts 12 to the car frame. Thus, all of the current returning from the car electrical system flows from the ground through the case 10, the moveable switch arm 24, the contact 27, the lug 28, and the lead 39 to the battery 31.

Let us assume that the engine is running. The oil pump of the engine is supplying pressure through the supply pipe 21 to the cylinder 13 to force the piston 17 forward, and the latter is holding the switch arm 24 forwardly against the contact 27 to close the electrical circuit of the engine. Let us assume that the oil supply of the engine fails, this causes a decreased pressure in the cylinder 13 and allows the spring 19 to force the piston inwardly, this causes the latch 22 to pull the moveable contact 24 away from the contact 27, thus breaking the circuit, shutting off the electrical supply, and stopping the engine.

Let us now assume that the oil supply has been restored and is desired to again start the engine, this can not be done with the contacts 24 and 27 separated, so some initial means must be provided for bringing these contacts together. This is accomplished by means of a latch lifting lever 32, hinged within the case 10 upon a hinge bolt 33. A flexible wire 34, within a flexible tube 35 is secured to the lever 32. The wire extends to a control knob 36 which may be mounted upon the instrument board of the automobile or in any other suitable position. When the knob 36 is drawn out, it lifts the extremity of the lever 32, causing the latter to lift the latch 22 from the pin 29. This allows the spring 26 to snap the switch arm 24 against the contact 27 to allow the motor to start. As soon as the motor starts the knob 36 is released to again engage the latch with the pin 29, so that stopping the motor will again break the circuit.

In the usual engine, the generator supplies current to the electrical system for charging the battery while the engine is running, and even if

the battery were cut out this generator would supply sufficient current to operate the engine. Therefore, some means must be provided to short circuit the generator before the battery is cut out, this is accomplished by means of a leaf spring contact 37, extending from a generator screw 38 into the opening path of the switch arm 24, and a pair of contact springs 40, extending from the contact 27. The screw 38 is connected to the generator (as shown at 41 in Fig. 7).

The springs 30 and the contacts 37 are so spaced that the movable switch arm 24 will contact at 37 before it breaks contact with the springs 40. This is necessary, for if the battery were cut out of circuit before the generator, the voltage of the latter would be sufficient to burn out the lights and other equipment of the automobile. With the above construction, however, the generator is always shorted before the final contact is broken between the arm 24 and the springs 40, so that the generator is out of circuit before the battery.

A small drain hole 42 is drilled through the cylinder 13 ahead of the piston to drain out any oil which may leak past the sealing washer 16.

It can be readily seen that the device serves many useful functions. As above described, failure of oil will stop the engine. Another function is that it prevents the driver from accidentally leaving his lights, radio, heater, or other electrical devices on, when he leaves the car, thereby draining the battery. As soon as he stops the engine all of these devices will be automatically cut out of circuit. It also acts as a theft lock, as an ordinary automobile thief is unaware that it is necessary to operate the knob 36 before the engine can be used.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:—

1. A pressure operated switch comprising: a pressure cylinder; a piston in said cylinder; a piston rod extending from said piston through one extremity of said cylinder; a first spring urging said piston into said cylinder; a stationary electrical contact; a movable electrical contact; a second spring urging said movable contact toward said stationary contact; means on said piston rod for engaging and pulling said movable contact away from said stationary contact as said piston moves into said cylinder; and manually operated means for releasing said piston rod from said movable contact when desired to allow said second spring to close said contacts.

2. A pressure operated switch comprising: a pressure cylinder; a piston in said cylinder; a piston rod extending from said piston through one extremity of said cylinder; a first spring urging said piston into said cylinder; a stationary electrical contact; a movable electrical contact; a second spring urging said movable contact toward said stationary contact; a latch member on the extremity of said piston rod; an engaging member on said movable contact to be engaged by said latch member so that said piston rod will act to separate said contacts as said piston moves into said cylinder; and means for releasing said latch member from said movable contact when desired.

3. A pressure operated switch comprising: a pressure cylinder; a piston in said cylinder; a piston rod extending from said piston through one extremity of said cylinder; a first spring urging said piston into said cylinder; a stationary electrical contact; a movable electrical contact; a second spring urging said movable contact toward said stationary contact; a latch member on the extremity of said piston rod; an engaging member on said movable contact to be engaged by said latch member so that said piston rod will act to separate said contacts as said piston moves into said cylinder; a lever extending beneath said latch member; and means for raising said lever to cause the latter to lift said latch member out of engagement with said engaging member.

4. A pressure operated switch comprising: a pressure cylinder; a piston in said cylinder; a piston rod extending from said piston through one extremity of said cylinder; a first spring urging said piston into said cylinder; a stationary electrical contact; a movable electrical contact; a second spring urging said movable contact toward said stationary contact; a latch member on the extremity of said piston rod; an engaging member on said movable contact to be engaged by said latch member so that said piston rod will act to separate said contacts as said piston moves into said cylinder; means for releasing said latch member from said movable contact when desired; and means for preventing rotation of said piston rod in said cylinder so that said latch member will always be maintained in operative position.

5. A safety switch for cutting off the battery of an automobile in consequence of a reduction in the oil supply pressure to the engine thereof comprising: a pressure cylinder; means for connecting said cylinder to the oil supply of an engine; a piston in said cylinder to be moved outward by the pressure in said cylinder; a spring acting to force said piston against said pressure; a stationary contact; a hinged contact; a spring for urging said hinged contact against said movable contact; a piston rod extending from said cylinder; a hooked latch member hinged to the extremity of said rod so as to engage and withdraw said movable contact from said stationary contact; means for releasing said latch member when desired; and means for placing said contacts in the battery circuit of an automobile.

6. A safety switch for cutting off the battery of an automobile in consequence of a reduction in the oil pressure to the engine thereof comprising: a pressure cylinder; means for connecting said cylinder to the oil supply of an engine; a piston in said cylinder to be moved outward by the pressure in said cylinder; a spring acting to force said piston against said pressure; a stationary contact; a hinged contact; a spring for urging said hinged contact against said movable contact; a piston rod extending from said cylinder; a hooked latch member hinged to the extremity of said rod so as to engage and withdraw said movable contact from said stationary contact; means for releasing said latch member when desired; means for placing said contacts in the battery circuit of an automobile; auxiliary contacts in the path of said movable contact to close a second circuit before the first contacts open; and means for placing said auxiliary contacts in circuit with the generator circuit of an automobile.

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