April 18, 1933. T. PILLA 1,903,876

ENGINE CONTROL

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Fig. 1.

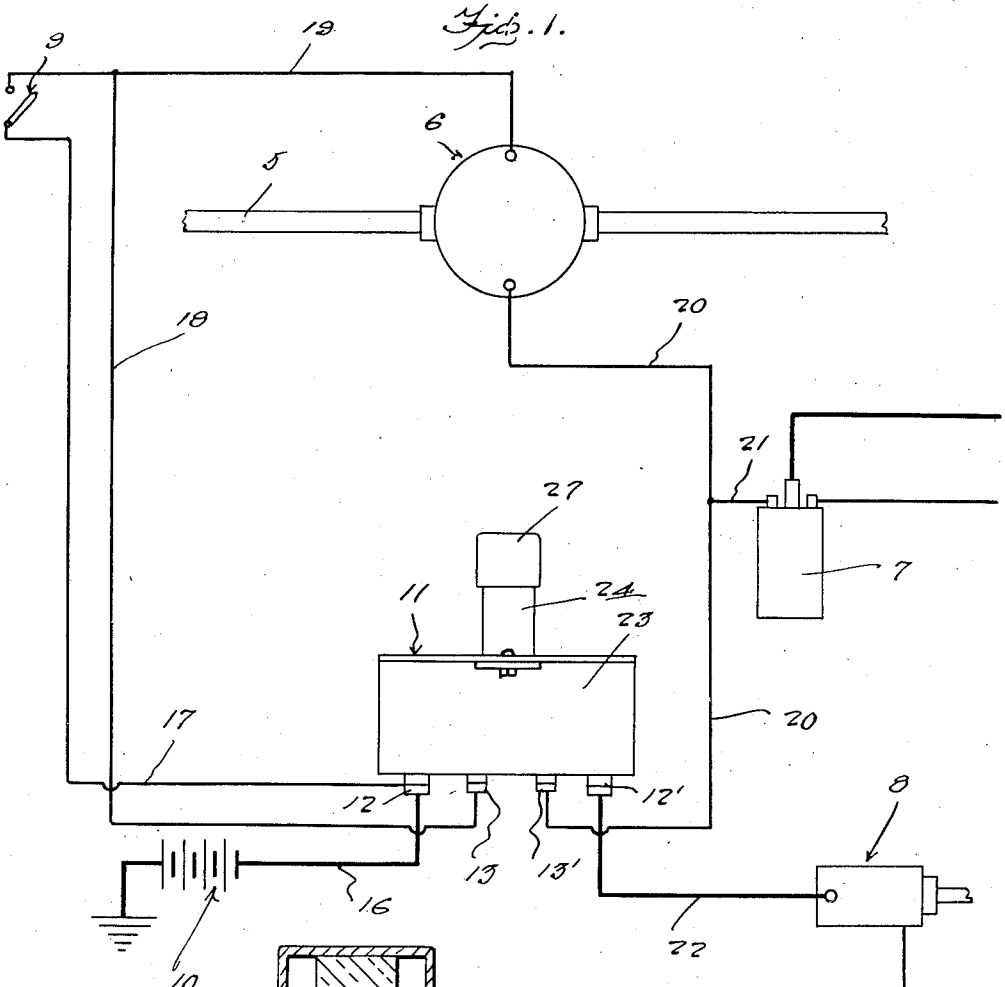
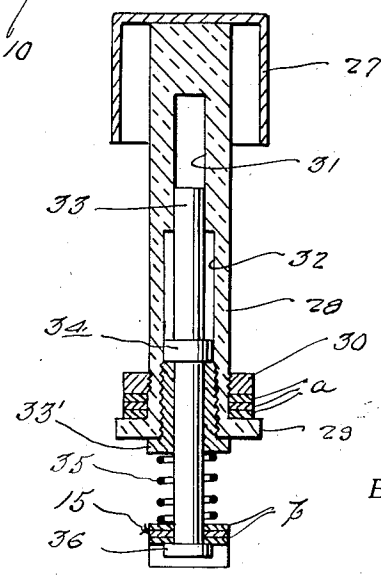


Fig. 4.



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Fig. 2.

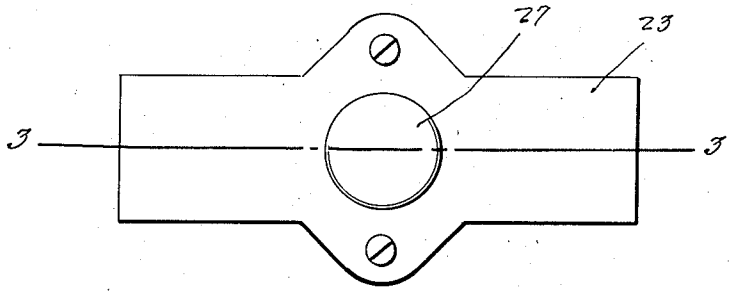
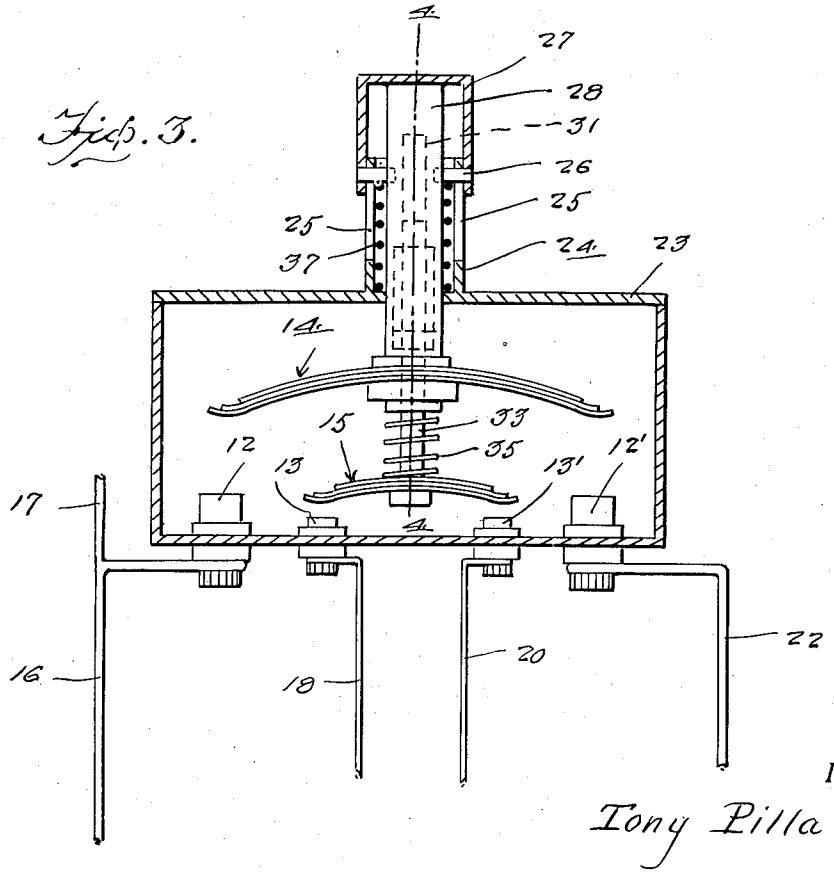


Fig. 3.



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UNITED STATES PATENT OFFICE

TONY PILLA, OF TRENTON, NEW JERSEY

ENGINE CONTROL

Application filed May 17, 1932. Serial No. 611,910.

This invention appertains to new and useful improvements in means for automatically controlling internal combustion engines and more particularly to a novel switching means for shutting off the ignition in the event the oil pressure drops to an inefficient degree.

This application is a continuation in part of my co-pending application Serial No. 567,744, which was filed on the 8th day of October, 1931.

The principal object of the invention is to provide a simple and inexpensive control switch for internal combustion engines for safeguarding against burnt-out bearings and other damages caused by poor lubrication.

These and other objects and advantages of the invention will become apparent as the hereinafter specification proceeds.

In the drawings:—

Figure 1 represents a diagrammatic view disclosing the electrical connections between the electrical devices involved.

Fig. 2 represents a top plan view of the switch.

Fig. 3 represents a vertical sectional view taken substantially on line 3—3 of Fig. 2.

Fig. 4 represents a sectional view taken substantially on line 4—4 of Fig. 3, with the parts removed.

Referring to the drawings wherein like numerals designate like parts, it will be seen that numeral 5 denotes the oil pressure line in which is installed the pressure controlled switch generally referred to by numeral 6, these switches being of conventional construction, its details not being material to the present invention.

Numeral 7 generally refers to the usual induction coil, while numeral 8 generally refers to the usual starter or motor. Further, general references are made to the ignition switch 9, the battery 10, and the novel switch generally referred to by numeral 11.

Referring to Fig. 3, it can be seen that there are four contacts, the large complementary contacts being denoted by numerals 12—12′ while the small complementary contacts are denoted by reference characters 13—13′. Operative in the switch 11 is the contactor generally referred to by numeral 14 and the contactor generally referred to by numeral 15, the contactor 14 being capable of bridging the contacts 12—12′ while the contactor 15 is capable of bridging the contacts 13—13′.

As is clearly shown in Fig. 1, a conductor 16 extends from one side of the battery 10 to the contact 12, and from the contact 12 extends the conductor 17 to one side of the ignition switch 9. A wire 18 extends from the opposite side of the ignition switch to the contact 13, while another wire 19 extends from this last-mentioned side of this switch 9 to one side of the pressure controlled switch 6. The opposite side of the switch 6 is connected by way of the conductor 20 to the companion contact 13′, and from this conductor 20 a connection 21 is made to the usual ignition induction coil 7.

A conductor 22 extends from the contact 12′ to the starter motor 8, as is all clearly shown in Fig. 1.

A detailed description of the switch 11 will now be given. In the construction of this switch a casing 23 is employed having an upstanding barrel 24 provided with a pair of upstanding slots 25—25 therein, and in which the pintles 26 on the cap 27 extend to prevent rotation of the cap. These pins bear into the dielectric block 28 which projects downwardly from the cap 27, through the barrel 24, and into the housing 23, the same being provided with an enlargement 29 at its lower portion upon which the leaves *a* of the contactor spring 14 rests, the leaves being provided with registering openings for receiving the block 28.

A nut 30 on the member 28 is feedable downwardly against the leaves *a* to secure the same against the enlargement 29. Extending longitudinally in the member 28 and opening through the bottom thereof, is the bore 31 which merges with the counter bore 32. Slidable in the bore 31 is the bar 33, while slidable in the counter-bores 32 is the collar 34 formed integrally on the bar 33. The rod 33 is normally urged downwardly so that the collar 34 is at the lower end of the counterbore 32 and against the bushing 33′, and this is accomplished by the

use of the compressible coiled spring 35. It will be observed that with the block 28 of di-electric material, the contactors 14 and 15 are adequately insulated from each other.

The lower end of the rod 33 is provided with a head 36 and upon this rests the leaves *b* of the spring contactor 15, and instead of the nut 30 (see Fig. 4) against the leaves *b*, the spring 35 bears directly against the springs for maintaining the same intact.

In the barrel 24 (see Fig. 3), and interposed between the pintles 26 and the top of the casing 23 is the compressible coiled spring 37 for normally maintaining the cap 27 elevated and the contactor 14 spaced above the companion contacts 12—12′. The spring 37 also serves to maintain the contactors 14 and 15 in the spaced relation shown in Fig. 3, although the spring 35 is employed to urge the contactor 15 downwardly to its full extent. This is required, because, the contactor 15 is first to bridge the contacts 13—13′ for establishing a connection between the battery 10, through the switch 9 and contacts 13—13′ to the induction coil 7.

The contactor 14 bridges the contacts 12—12′ secondarily so that when the motor 8 is started, the ignition system is already energized.

It can be seen that with the contactor 15, bridging the contacts 13—13′, and the contactor 14 bridging the contacts 12—12′ the current will flow from the battery 10 by way of the contacts 12 and conductor 17 through the switch 9 (providing the ignition switch 9 is closed) and from there by way of the conductor 18 to the contact 13, across the contactor 15 and by way of the contact 13′ and conductor 20, to the induction coil 7. This phase of operation takes place momentarily before the contactor 14 bridges the contacts 12—12′ the latter resulting in a connection between the conductors 16 and 22, whereby current is supplied directly from the battery 10 to the motor 8 for starting the internal combustion engine, (not shown).

Obviously, after the engine has been started oil, if the system is in order, will flow under pressure through the switch 6 and closing it makes a complete circuit from switch 9 through wires 19, 20 and 21 to coil 7, so that when the foot is released from the cap 27 current flows from the battery 10 by way of the contact 12, through the conductors 17, switch 9 and conductor 19 through the switch 6 to the ignition coil 7, thus dispensing with the switch 11.

However, in the event the engine fails to keep running, due to lack of pressure in the oil line 5 the operator's foot can keep the cap 27 slightly depressed so that the contactor 15 will be bridging the contacts 13—13′. This will maintain a connection from the battery through the ignition switch by way of the conductor 18, contacts 13—13′ and conductor 20 to the coil 7 independently of the switch 6 and this may be desirable in cold weather when oil circulation requires a few minutes to develop pressure.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having thus described my invention, what I claim as new is:—

In combination, an internal combustion engine, a source of electricity, an ignition system for the engine, a starting motor for the engine, a fluid pressure line responsive to the action of the engine, a switch in said line adapted to be closed by fluid in the line under pressure, a multiple circuit maker and breaker including a primary switch and a secondary switch and a single operating member for controlling said primary and secondary switches, said primary switch being interposed between said source of electricity and the ignition system, said secondary switch being interposed between the source of electricity and the starting motor, said fluid pressure line switch being interposed between the source of electricity and the ignition system, said primary switch being closable by the single operating member before affecting the secondary switch, said secondary switch being closable by continuation in motion of the said operating member.

In testimony whereof I affix my signature.

TONY PILLA.