

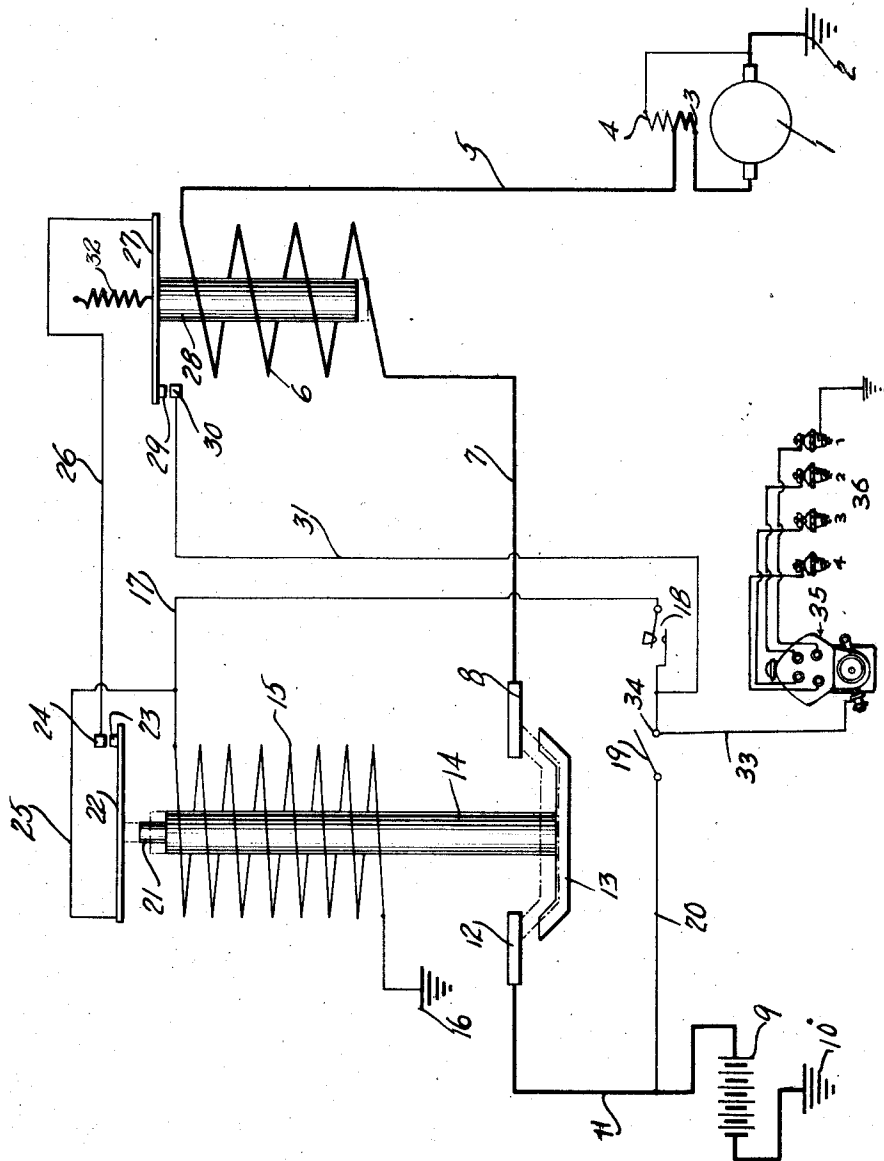
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AUTOMATIC STARTING DEVICE FOR MOTORS

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WITNESSES

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AUTOMATIC STARTING DEVICE FOR MOTORS.

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To all whom it may concern:

Be it known that we, LOY M. WILLIAMS and CHARLES J. JEWETT, citizens of the United States, and residents of Fort Smith, in the county of Sebastian and State of Arkansas, have invented a new and Improved Automatic Starting Device for Motors, of which the following is a full, clear, and exact description.

The invention relates to automatic starting devices for automobiles. An object of the invention resides in the provision of means whereby an automobile engine may be started merely by pressing a button and the starter may be disconnected from the engine automatically.

Another object resides in the provision of means whereby the entire operation of starting the engine and disconnecting the starter from the engine after the engine commences to operate by itself is effected merely by momentarily pressing one button, the operation of the remainder of the apparatus being entirely automatic.

A further object resides in the provision of means whereby the battery and starting device are automatically cut off from the circuit the instant that they are not needed to turn the engine over, thereby saving the battery and eliminating the danger of injury to the starting motor.

A still further object resides in the particular construction and arrangement of parts which are hereinafter described and claimed and shown in the accompanying drawings.

The invention is illustrated in the drawing and represents a preferred application of the invention, although it is understood that modifications in the construction and arrangement of the parts and in the character of the materials used may be adopted without departing from the spirit of the invention.

As shown in the drawings, the apparatus comprises a starting motor 1 grounded at 2 and provided with series windings 3 and a shunt winding 4 connected by a wire 5 to a magnet winding 6, which in turn is connected by a wire 7 to a stationary contact 8.

A battery 9 grounded at 10 is connected by a wire 11 to another stationary contact 12 operatively associated in relation to the stationary contact 8. A switch member or arm 13 normally spaced away from

the contacts 8 and 12 is carried by a movable magnet core 14. This core is energized by a winding 15 grounded at 16 and connected by a wire 17 to a push-button switch 18. This push-button switch is in series with an ignition switch 19 and this in turn is connected by a wire 20 to the battery 9. Whenever the winding 15 is energized, the core 14 is pulled up so that the switch member 13 bridges the contacts 8 and 12. This bridging causes the circuit to be established from the battery through said contact, the winding 6 and the starting motor.

The upper end of the core 14 is provided with a projecting portion 21, or striker head, adapted when moved upward to contact with a movable bar 22 one end of which is provided with a contact 23 to make a circuit through a contact 24 disposed adjacent thereto. One end of the bar 22 is connected by a wire 25 to the end of the winding 15. The contact 24 is connected by a wire 26 to an end of a bar 27 carried by the core 28 of the magnet winding 6. The other end of the bar 27 carries a contact 29 movable with the bar 27 but adapted when moved in a given direction to engage with another contact 30. This contact 30 is connected by a wire 31 to a point between the push button 18 and the ignition switch 19. When a definite current is established in the winding 6 of the magnet, the core 28 will be pulled down to close the circuit through the contacts 29 and 30.

The characteristics of the magnet winding 6 and the core 28 are so calculated that it requires a definite amount of current to move the core down, preferably that amount of current drawn by the motor 1 when turning over the engine to start the same. This winding is also calculated that after the engine is started the reduction of current drawn by the motor is such as to be insufficient to hold the core 28 down, whereby any suitable means, such as a spring 32 pulls the core 28 up to break the contacts 29 and 30. On the other hand, when current is flowing through the winding 15, the core 14 is held up to bridge the contacts 8 and 12, and when said winding 15 is deenergized, the core drops, breaking the contacts 23 and 24.

In a portion of the device it is first necessary to close the ignition switch 19 thereby insuring that the engine will be started in a condition to pick up as it is being turned

over by the motor 1. After the switch 19 is closed, the button 18 is momentarily actuated. During the instant of time that this button is actuated, a circuit is established as follows: from battery 9, wire 20, switch 19, switch 18, wire 17, winding 15 to ground at 16. This circuit causes the energization of winding 15 whereby the core 14 is pulled up to bridge the switch arm 13 between contacts 8 and 12. This bridging action establishes the following circuit: from battery 9, wire 11, contact 12, switch arm 13, contact 8, wire 7, winding 6, wire 5, through the motor to ground 2. The amount of current drawn by the motor in turning over the engine before the engine becomes energized is sufficient, in accordance with the design of the apparatus, to cause the core 28 to be turned down, engaging the contacts 29 and 30. This engagement establishes the following circuit: battery 9, wire 20, switch 19, wire 31, contact 30, contact 29, bar 27, wire 26, contact 24, contact 23, bar 22, wire 25, winding 15 to ground at 16. This circuit, therefore, establishes a holding circuit for the energization of winding 15 which was initially and momentarily energized through the push button 18 and the wire 17, as previously traced. This holding circuit is maintained closed as long as the current through the winding 6 is sufficient to hold the core 28 down. However, the instant the engine starts to turn over, the current demanded by the motor is reduced to such an extent that the flux produced by the winding 6 will not hold the core 28 against whatever means is adopted to pull the core back. This causes a break in the contacts 29 and 30 whereby the holding circuit for the winding 15 is broken. By breaking this circuit the main switch arm 13 is permitted to become disengaged from the main contacts 8 and 12 whereby the battery is disconnected from the motor.

It will be observed that it is merely necessary after closing the ignition switch 19, which is essential to permit the engine to explode the mixture, to momentarily push the button 18. Instantly the main contacts are closed and the holding circuit is established for the winding 15 which is not broken until the circuit has been reduced below a given amount.

It will be observed that this device is extremely simple in operation and that it re-

quires a minimum amount of attention and effort on the part of the person using it.

A contact 34, adapted to be engaged by the switch 19, is connected with a circuit 33 which controls the ignition designated at 35, the circuit being grounded at 36. When the switch 19 is closed, circuit 33 is energized and the ignition is connected with the battery 9.

What we claim is:

1. An automatic starting device for motors which comprises a main circuit including an electric motor, a battery, a main switch in said circuit, and a magnetic means, a holding circuit including a magnetic means for controlling movement of the main switch, an operator's switch connected between the battery and the second mentioned magnetic means, a switch controlled by the energization of the second mentioned magnetic means, and a switch cooperating with the last mentioned switch for closing the holding circuit and operated upon energization of the main circuit magnetic means.

2. An automatic starting device for motors which comprises a main circuit including an electric motor, a battery, a main switch in said circuit, and a coil, a core for operating said switch, a holding circuit including a coil adapted upon energization to actuate the core, an operator's switch connected between the battery and the second mentioned magnetic coil, a second switch actuated by said core, a second core associated with the main circuit coil, a switch actuated by the last mentioned core and cooperating with the second mentioned switch for closing the holding circuit.

3. An automatic starting device for motors which comprises a main circuit including an electric motor, a battery, a main switch in said circuit, and a magnetic means, a holding circuit including a magnetic means, an operator's switch connected between the battery and the second mentioned magnetic means, a switch actuated simultaneously with the main circuit switch upon energization of the second mentioned magnetic means, and a switch actuated upon energization of the main circuit magnetic means for closing the holding circuit.

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