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H. E. RIDER

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IGNITION CIRCUIT BREAKER

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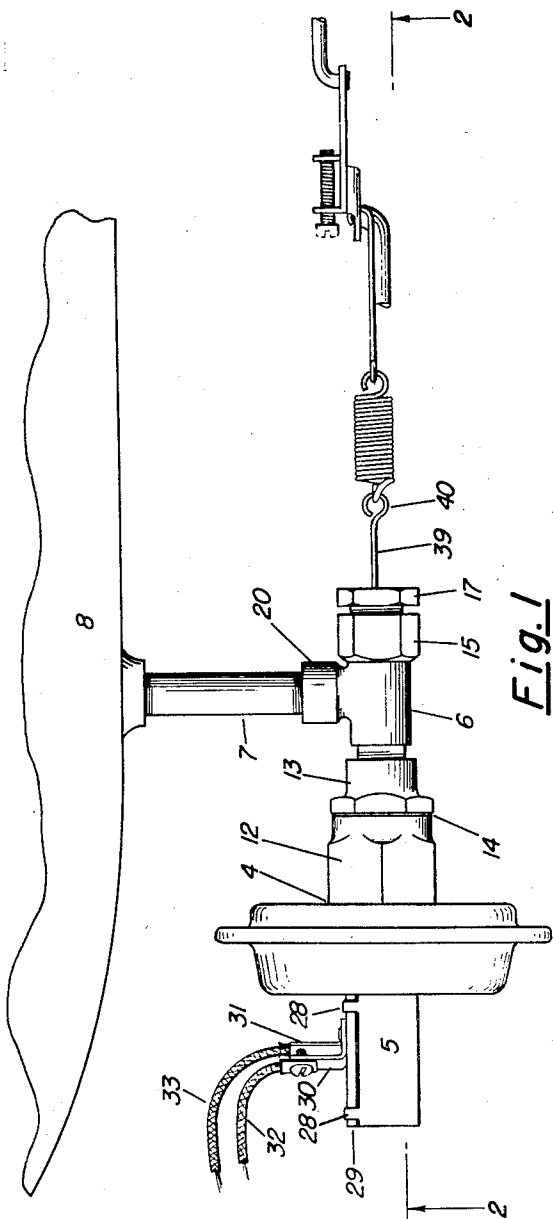


Fig. 1

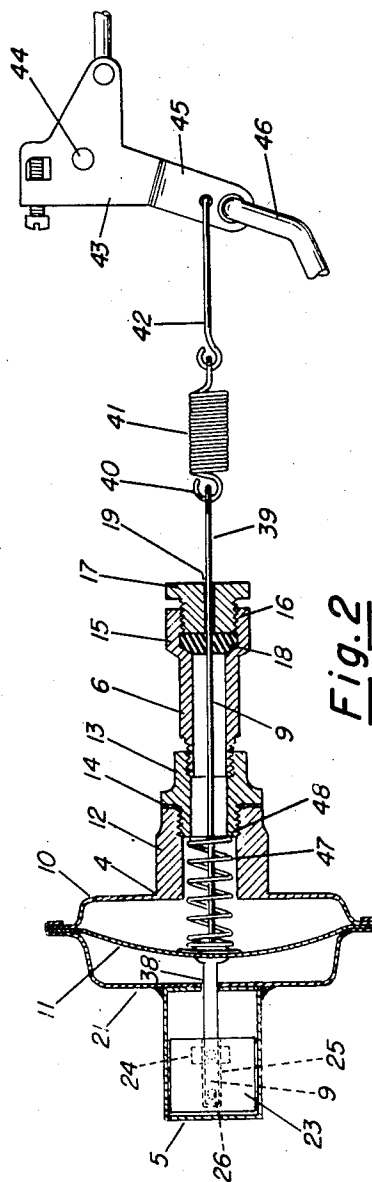


Fig. 2

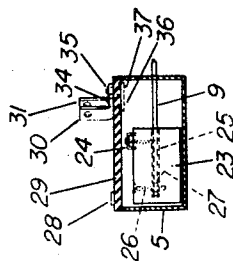


Fig. 3

INVENTOR.
HARRY E. RIDER

BY *Everett N. Curtis*

ATTORNEY

UNITED STATES PATENT OFFICE

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IGNITION CIRCUIT BREAKER

Harry E. Rider, San Diego, Calif.

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4 Claims. (Cl. 200—83)

1

My invention relates to ignition circuit breakers, particularly switches for electric circuits employing automatic suction means and complementary manually operated mechanism for opening or closing such circuits.

The primary object of my invention is to provide improved automatic means for causing the ignition electric circuit of a combustion engine to open immediately upon the stopping of such engine, even though the main switch of such circuit is left on, thereby avoiding overheating or burning of parts resulting from the maintenance of a closed circuit after the engine has ceased to operate.

Another object is to provide an auxiliary suction controlled electric switch having contacts operated by a diaphragm sensitive to suction and a spring serving to maintain such diaphragm in position to hold open said contacts except when such suction is exerted thereon.

Another object is to provide in an electric switch assembly for the ignition circuit of a combustion engine, a sliding switch bar connected to close the contacts of the switch through the operation of the throttle lever while starting the engine; said switch member being also connected with a diaphragm arranged and adapted against spring pressure to maintain the closure of said contacts by the suction produced through conduit connection with the intake manifold of said engine after the engine has been started and after the cessation of the throttle lever operation.

My invention further consists of other novel features of construction and combinations and arrangements of elements and parts illustrated in the drawing and as hereinafter more fully described and claimed.

Attention is hereby directed to the accompanying drawing, illustrating a preferred form of my invention, in which similar numerals of designation refer to similar parts throughout the several views, and in which,

Figure 1 is a plan view of the electric switch assembly embodying my invention and adjacent parts, showing my improved switch and connections with wires leading to the ignition circuit, and connections with the intake manifold of a combustion engine and with the rod leading to the accelerator pedal;

Fig. 2 is a longitudinal vertical section on line 2—2 of Fig. 1, looking in the direction of the arrows, the showing of the end of the pipe 7 being omitted for the purpose of better illustration, and

Fig. 3 is a horizontal section of the box housing

2

the sliding block carrying the contact bridge for automatically engaging the lead wire contacts mounted upon the box and opening or closing the circuit of the switch.

Referring to the drawing, the switch assembly there shown, includes the vacuum unit 4, switch box 5, hollow fitting 6, connector 13, and conduit pipe 7 leading therefrom to intake manifold 8, sliding switch bar 9 and connections thereof leading to the throttle lever on the carburator.

The vacuum unit 4 comprises the diaphragm housing 10, diaphragm 11 mounted therein, hub 12 extending from and integral with said housing, and connector 13 whose inner end is in threaded engagement with said hub and sealed thereon by gasket 14. In threaded engagement with the outer end of the connector 13 is the inner end of the hollow fitting 6, whose outer end 15 is formed with the threaded socket 16, in which is seated the threaded end of plug 17 together with packing 18 having extending therethrough the passageway 19, whose purpose will shortly be described. Integral with the fitting 6 and opening out of the side of the same is the pipe branch 20 and in threaded engagement therewith is one end of the conduit pipe 7, the other end thereof being connected with and leading into the intake manifold 8 of a combustion engine, such manifold being conventionally indicated.

Welded to the wall 21 of the housing 10, opposite to the hub 12, is the rectangularly shaped switch box 5, in the hollow of which is slidably installed to move longitudinally therein the fibre block 23, bearing the contact bridge 24. Seated within the socket 25, formed in the block 23, and secured thereto by the screw 26, is one end of the switch bar 9; the threaded end of said screw passing through an opening 27 in said end of said bar and serving to fasten said bar to the block 23. Secured by fingers 28 integral with the sides of the box 22, is the fibre cover 29, and mounted thereon are the terminals 30 and 31 having wires 32 and 33 leading to the ignition coil and forming part of the circuit thereof; the said terminals being connected to posts 34 and 35 extending through said cover and having contact heads 36 and 37 exposed within said box and positioned to engage with contact bridge 24 upon the same being slid on the block 23 to contact therewith, and thereby to close the ignition circuit.

As shown in Fig. 2, the switch bar 9 extends from its connection with the block 23 through the passageway 38 in the abutting walls of the box 22 and housing 10, and into the hollow thereof; within which housing it passes through and is

3

firmly secured to the center of the diaphragm 11. Thence the bar extends through the hollows of the hub 12, connector 13, fitting 6, and through the passageway 19 of the plug 17, outside of which protrudes the other end 39 of said bar forming the loop 40, attached to one end of the expansion spring 41; the other end of said spring being attached to the link 42, pivotally secured to the lever 43, conventionally mounted to swing upon the pivot 44 on the carburetor of a gasoline engine, and having its lower end 45 conventionally connected by the rod 46 to the accelerator lever assembly. In order to insure the maintenance of the bent position of the diaphragm 11 shown in Fig. 2, when not acted upon by suction or the switch bar 9, as hereinafter described, I preferably install the helical compression spring 47 within the hollow of the housing 10 and the hub 12; the said spring encompassing the bar 9, and having one end abutting against the diaphragm 11 and its other end engaging the shoulder 48 of the connector 13.

The foregoing arrangement of parts is such that upon the manual or pedal depression of the accelerator lever of said assembly, and the starting of the engine with which it is connected, the rod 46 will cause the lever 43 to turn upon its pivot 44 and to exert a pull upon the link 42, which movement is transmitted to the switch bar 9 through the spring 41 to the diaphragm 11, causing said diaphragm to move to the right and at the same time bringing the bridge 24 into engagement with the contact heads 36 and 37, thereby closing the ignition circuit. Thereupon, with the starting of said engine, air will be drawn into the intake manifold 8, producing a vacuum therein, the suction of which is immediately transmitted through the pipe 7 and connections to the diaphragm 11 within the housing 10; the said suction acting to hold the said diaphragm in the position brought about by the depression of the accelerator lever and serving to maintain the contact of the bridge 24 with contact heads 36 and 37 and to secure the closing of the ignition circuit, so that after the release of said accelerator lever said circuit will continue to be maintained. Upon the stopping of the engine, and consequent cessation of the drawing of air into the intake manifold, the suction theretofore acting upon the diaphragm 11 will terminate, and the pressure of the spring 47 will be such as to force back the said diaphragm into the position shown in Fig. 2, and to break the connection between the bridge 24 and heads 36 and 37, thereby opening the ignition circuit and protecting the ignition coil, distributor points, and battery from danger of overheating or burning of parts which might result from inadvertently leaving the key turned on in the ignition switch.

My invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment, as above set forth, is therefore to be considered in all respects as illustrative and not restrictive, the scope of my invention being indicated by the appended claims rather than by the above description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What I claim and desire to secure by Letters Patent is:

1. An electric switch assembly for the ignition circuit of a combustion engine, comprising an elongated casing incorporating therein in succes-

4

sive connection an auxiliary switch box with terminals thereon, a housing and diaphragm mounted therein, and a tubular extension therefor; said casing having a passageway therein through which extends for its entire length a sliding switch bar mounted to make contact with the said terminals and connected with said diaphragm; said bar being adapted to be connected to, and to be slidably reciprocated by, the foot lever of the accelerator assembly of said engine, and thereby acting to open or close the contacts of said terminals; and said diaphragm through suction produced through conduit connection with the intake manifold of the engine operating to maintain said lever in holding closed the contacts of said terminals after the engine has started and after the cessation of the throttle lever operation.

2. An electric switch assembly for the ignition circuit switch of a combustion engine, comprising an elongated casing incorporating therein in successive connection an auxiliary switch box with terminals thereon and having slidably mounted therein a block with contact bridge engageable with said terminals, a housing and diaphragm mounted therein, and a tubular extension with plug therefor; both said casing and plug having a continuous passageway therethrough a sliding switch bar extending through said passageway and affixed to said block and diaphragm and operable to move the contact bridge of said block into and out of said engaging contacts; said bar being adapted to be connected to, and to be slidably reciprocated by, the foot lever of the accelerator of said engine and thereby acting to open or close the contacts of said terminals; and said diaphragm through suction produced through conduit connection with the intake manifold of the engine cooperating to maintain said lever in holding closed the contacts of said terminals after the engine has started and after the cessation of the throttle lever operation.

3. An electric switch assembly for the ignition circuit of a combustion engine, comprising a switch box having therein terminals forming part of the circuit of the ignition coil, an electric contact bridge mounted to slide within said box and to open and close the contacts of said terminals, a housed sliding switch bar one end of which is connected with and operable to slide as aforesaid said contact bridge, and the other end of which bar is adapted to be secured to and to be slidably reciprocated by the front lever of the accelerator assembly of said engine, and a housed diaphragm connected with said switch bar intermediate the ends thereof and operable against spring pressure to maintain the closure of said contacts by suction produced through conduit connection of said bar and diaphragm with the intake manifold of said engine during the operation thereof.

4. An electric switch assembly for the ignition circuit switch of a combustion engine, comprising an elongated casing incorporating therein in successive connection, an auxiliary switch box with terminals thereon, a housing and diaphragm mounted therein, and a tubular extension with plug therefor; said casing and plug having a passageway therein through which extends a sliding switch bar mounted to make contact with the said terminals and connected with said diaphragm; said bar being adapted to be connected by an expansion spring to and to be slidably reciprocated by the foot lever of the accelerator assembly of said engine and thereby acting to open

and close the contacts of said terminals; and said diaphragm through suction produced through conduit connection with the intake manifold of the engine operating to maintain said lever in holding closed the contacts of said terminals after the engine has started and after cessation of the throttle lever operation.

HARRY E. RIDER.

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