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C. J. STEPHANI

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IGNITION CUTOFF SWITCH

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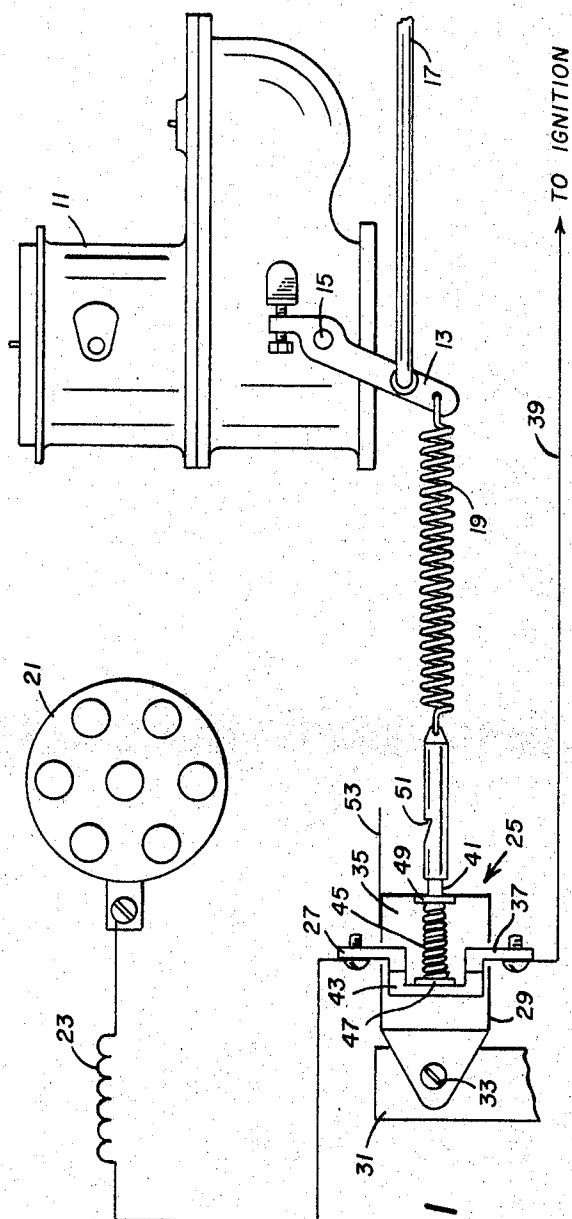


FIG. 1

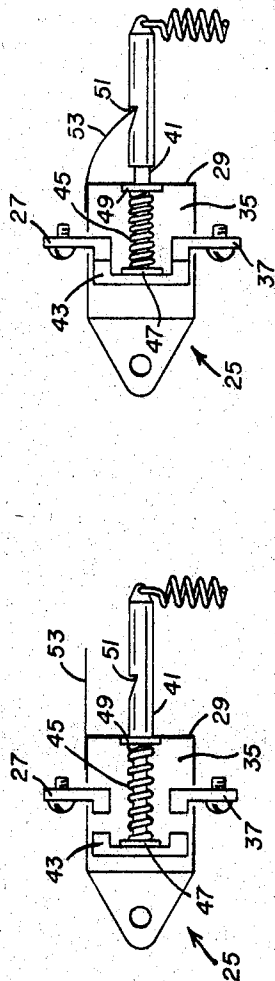


FIG. 3

FIG. 2

INVENTOR.

CHARLES J. STEPHANI

BY

*Fuchs, Patton,
Rieber, Lee & Uebel*
ATTORNEYS

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IGNITION CUTOFF SWITCH

Charles J. Stephani, 1185 Pepper Drive,
El Cajon, Calif. 92021

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5 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus for interrupting the ignition circuit of an internal combustion engine in the event that the spring, which opposes the foot pressure on the throttle, breaks. A switch in the ignition circuit is maintained closely by the spring which opposes foot pressure. However, a second spring which is normally overcome by the force of the foot pressure opposing spring, biases the switch to interrupt the ignition circuit when the foot pressure opposing spring breaks.

The present invention relates to a safety cutoff device to be used to render an engine inoperable when the control mechanism malfunctions. More specifically, the invention relates to a safety switch that is adapted to be used in the ignition system of an engine, which switch is actuated by the throttle control mechanism.

The safety switch of this invention is adapted to be used in the ignition circuit of an engine of the type that includes a throttle control mechanism that is biased to the closed position. The switch essentially comprises a movable, electrical conductive contact, in series in the ignition circuit. The contact is connected with and electrically insulated from the control mechanism biasing element and is biased to the ignition circuit closed position by such element. The contact is biased to the circuit open position when the control mechanism biasing element becomes inoperative.

Other features and the advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing, wherein a preferred embodiment of the invention is illustrated.

In the drawing:

FIG. 1 is a diagrammatic view of the carburetor and a portion of the ignition circuit of an internal combustion engine, including the switch of this invention, the switch being shown in section;

FIG. 2 is a sectional view of the switch shown in FIG. 1, the switch being shown with the throttle control biasing element being inoperative and the switch open; and

FIG. 3 is another sectional view of the switch shown in FIG. 1, the switch being shown in the locked closed position.

Referring more in detail to the drawing, and more particularly to FIG. 1, a conventional automobile carburetor is shown at 11. The control arm 13 is pivotally mounted at 15 and is actuated by a control rod 17 that is operated from the automobile accelerator pedal (not shown).

The control arm 13 is biased into the throttle closed position by a tension spring 19. When the accelerator pedal is depressed, the control rod 17 moves to the right as viewed in FIG. 1. The control arm 13 is moved counterclockwise and the engine (not shown) is accelerated. It is noted that the accelerator control mechanism of many automobiles is designed such that when the spring 19 is disconnected or broken the accelerator pedal (not shown) depresses to the floorboard of the automobile, thus moving the control rod 17 to the right, as viewed in FIG. 1, and accelerating the engine.

Referring now to the ignition system, a conventional distributor is shown at 21 and is electrically connected

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with a coil 23. The coil 23 is electrically connected to the switch 25 at the terminal 27. The switch 25 includes a housing 29 that is mounted on the engine block 31 by a screw 33. The housing 29 forms a hollow compartment 35 and the terminal 27 extends therein. A second terminal 37 extends into the opposite side of the compartment 35. Both terminals 27 and 37 are electrically insulated from the housing 29. The terminal 37 is in communication with the automobile ignition switch by the electrical wire 39.

A shaft 41 extends slidably into one end of the housing 29 and carries an electrical contact 43 on the inner end thereof. The contact 43 is in contact with the terminals 27 and 37 when the shaft 41 is moved to the extreme right position. The shaft 41 is formed of an electrical insulating material. A spiral spring 45 surrounds the shaft 41 and biases the contact 43 to the left. An insulating washer 47 is included between one end of the spring 45 and the contact 43, and a conventional washer 49 is disposed between the housing 29 and the opposite end of the spring 45.

The extending end of the shaft 41 includes a notch 51. A leaf spring 53 extends from the housing 29 and is adapted to be urged manually downwardly, as viewed in FIG. 3, and to engage the notch 51 and lock the shaft 41 in the extreme right position. The extending end of the shaft 41 is connected to the control mechanism biasing spring 19. The spring 19 is of sufficient strength to overcome the force of the spring 45 when connected with the throttle arm 13, thus causing the contact 43 to be maintained in contact with the terminals 27 and 37.

Under normal conditions, the spring 53 is in the position shown in FIG. 1.

The housing, including the contacts, the spring 45, shaft 41 and manually latching spring 53, forms an accessory assembly which can be sold as such and which is readily attached to the engine.

From the foregoing, it will be apparent that under normal operating conditions the switch 25 will be closed, thus completing the ignition circuit of the engine in which the switch is being employed. If, at any time, the control mechanism biasing spring 19 should break, the spring 45 will urge the contact 43 to the left, thus breaking the ignition circuit. This position of the switch is shown in FIG. 2. With the switch in this position, the engine will be rendered inoperable and the danger that may result from the control mechanism forcing the control arm 13 to the full open position, will be avoided. It will be clear that this feature is extremely important where the automobile is being operated in heavy traffic.

After the operator has become aware of the malfunctioning of the spring 19, he may desire to continue his trip and to have the spring 19 replaced. By merely engaging the leaf spring 53 with the notch 51, as shown in FIG. 3, the ignition circuit will be closed and the automobile is again ready for operation. Since the operator is already aware of the malfunctioning control mechanism, he can operate the accelerator pedal taking proper precaution for this malfunction.

From the above, it will be apparent that the switch of this invention provides an extremely important safety feature and a convenient means for preventing runaway automobiles.

I claim:

1. Apparatus for interrupting the ignition circuit in an engine of the type that includes a throttle control mechanism, which mechanism includes a biasing element normally urging the throttle toward closed position, and which apparatus comprises in combination:

(A) a switch including a movable electrical contact in series with the ignition circuit and insulatably

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connected to the throttle control mechanism element for biasing the contact to close the circuit;

(B) means for biasing the contact and opening the circuit when the control mechanism biasing element becomes inoperative;

(C) means fixedly supporting the contact and biasing means as an assembly on the engine, said assembly including

(1) manually controlled means for moving and retaining the contact in circuit closing position.

2. Apparatus as defined in claim 1, characterized in that the manually controlled means yieldingly urges the movable contact into circuit closing position.

3. Apparatus as defined in claim 1, characterized in that the manually controlled means renders the biasing means ineffective.

4. A system comprising in combination:

(A) an engine ignition circuit including:

(1) an electrical switch in series in the circuit and including

(a) a stationary contact;

(b) a movable contact for opening and closing the circuit;

(c) means biasing the movable contact into the open position;

(B) an engine throttle control mechanism including

(1) a biasing element for biasing the mechanism to the throttle closed position;

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(C) means for operatively connecting the switch movable contact to the throttle control mechanism biasing element, said biasing element being in opposition to the biasing means and having a biasing value sufficient to overcome the effects of the biasing means for maintaining the switch closed when the throttle control biasing element is operative, said biasing means opening the switch when said biasing element is inoperative;

(D) manually controlled means for rendering the biasing means ineffective by moving the movable contact into engagement with the stationary contact and retaining said contacts in engagement.

5. A system as defined in claim 4, characterized in that the manually controlled means yieldingly urges the movable contact into engagement with the stationary contact.

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M. GINSBURG, Assistant Examiner