March 9, 1943. F. HORNAIN 2,313,549

SAFETY SWITCH

Filed May 31, 1938

FIG. 1.

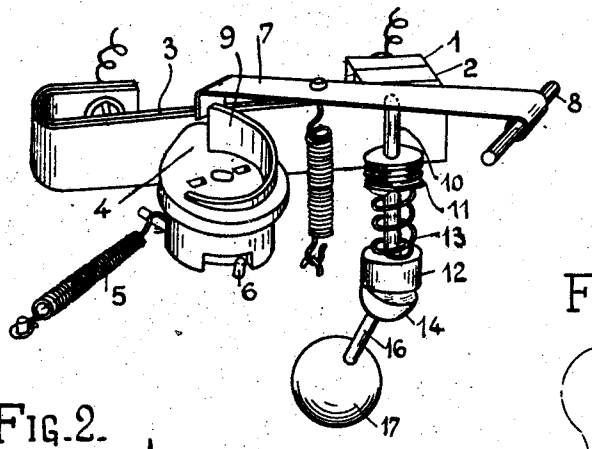


FIG. 2.

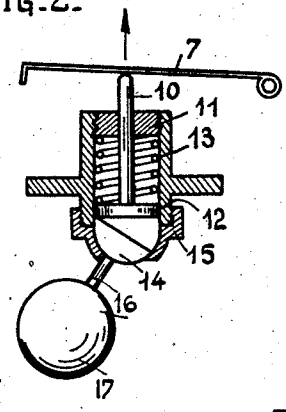


FIG. 3.

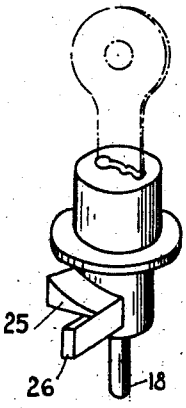


FIG. 4.

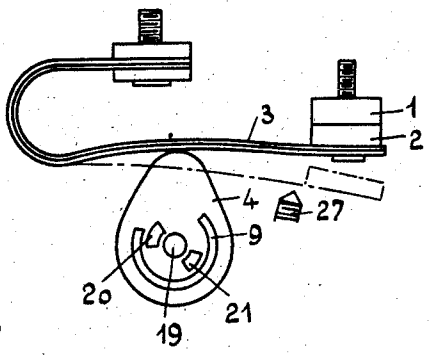
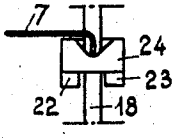


FIG. 5.



INVENTOR

FRANCOIS HORNAIN

BY

Young, Emery & Thompson

ATTORNEYS

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SAFETY SWITCH

François Hornain, Arras, France; vested in the Alien Property Custodian

Application May 31, 1938, Serial No. 211,060
In France June 1, 1937

4 Claims. (Cl. 200—52)

This invention relates to an automatical safety switch against fire and stealing away of any vehicle.

The object of the invention is to provide a safety switch for vehicles of all kinds and more particularly for motor cars, by which it is possible to cut off the current of the battery at will as well as the ignition current, and which operates automatically under the action of a horizontal shock regardless of the direction of the said shock in order to effect automatically such an interruption of the current.

The same switch is also adapted to operate as a switch against stealing away of the vehicle and for this purpose it may be actuated by means of a key.

Referring to the appended drawing there are shown by way of non limitative example the details of the operation of a device the casing of which is supposed arranged horizontally, as, for instance, under the floor of the car, but similar devices may be constructed so as to be arranged vertically or obliquely and, for instance, on the dashboard.

In Figure 1 the main members which the switch comprises are shown.

Figure 2 is a sectional view showing the device for detecting shocks, and

Figure 3 shows an embodiment of the control of the anti-stealing device through a lock the key of which can be taken off in the releasing position.

Figure 4 is a plan view of the control cam of the switch and

Figure 5 shows another embodiment of the lock control by means of a small auxiliary cam.

Anti-stealing devices have been made hitherto which operated for cutting off the ignition current of a motor car through grounding of the magneto or through the interruption of the primary current.

Again, devices for the protection against fire have been provided which operated through the interruption of the ignition current or through the interruption of the circuit of the storage battery.

Safety devices for the protection against fire in the case of an accident have been provided which operate through the displacement of a ball or of a fluid contact, generally a mercury contact, when the car is upset or overturned, for instance.

The present invention has for its object a single device permitting to solve these various problems.

The object of this invention is characterized by the closure of the switch by means of a cam which is maintained in its position through a lever which can be raised either through the rotation of a lock, or automatically through an inertia release, the cam being brought to its initial position again after the interruption of the current under the action of the same lock.

The switch comprises two control contact pieces 1 and 2, one of which is fixed and conveniently isolated, while the other is mounted at the end of a flexible blade 3 which is also insulated and constructed in a known manner and which, when left free, tends to move the contact pieces away from another as shown in Figure 4.

The contact is effected through a cam 4 which rests on the said flexible blade and forms the main member of the switch.

This cam, which is constantly urged by a spring 5 to its initial position and the displacement of which is limited by a stop 6 is held in its circuit closing position by a lever 7 which is pivotally mounted on an axis 8 and urged by a spring, the nose of this lever maintaining the end of a helical plane 9 which is fast with the resting cam of the blade of the switch 1.

When the lever 7 is raised the piece 4 is left free so that it can be rotated under the action of the spring 5, with this result that the blade through its flexibility will interrupt the electrical circuit.

This result can be obtained by means of a device which operates under the action of the inertia in the case of shocks and which is shown in Figures 1 and 2.

Such a device comprises a stop 10 longitudinally sliding and guided in a piece 11 which terminates in a piston 12 pushed by a spring 13 which is conveniently adjusted.

The lower end of this piston rests on a ball of the same diameter or having a smaller diameter and formed of a half sphere 14 which is maintained by a piece 15 in which an opening for the passage of a rod 16 fast with the half sphere is provided.

This rod 16 carries at its end a mass 17 which can be displaced under the action of a shock.

In the normal position the stop 10 and the rod 16 are aligned, the piston 12 resting on the face of the half sphere 14, but when the car receives a shock the mass 17 will tilt through its inertia, regardless of the direction of the shock, as shown in the drawing, thus rotating the ball with this result that the piston 12 is raised and also the lever 7 through the medium of the stop 10, thus releasing the switch.

Alternatively this interruption can be obtained by means of a lock arranged in the axis of the piece 4.

For this purpose a lock of a known type such as the lock shown in Figure 3 can be secured to the casing of the device, this lock being provided with an extension formed of an operating axis 18 which passes through the middle hole 19 of the piece 4.

Various modes of operation are possible, one of which is shown in Figure 5.

In this case the piece 4 is provided with notches 20 and 21 through which the tenons 22 and 23 of a cam member 24 pass.

This cam member 24 is provided with a recess on the bottom of which the nose of the lever 7 rests in the circuit closing position and when the key is turned the tenons 22 and 23 are shifted in the play allowed by the dimensions of the notches 20 and 21, which causes cam member 24 to raise the lever 7 so that the cam member 4 which is urged by the spring 5 rotates and interrupts the circuit.

As shown in Figure 4, the same result could be obtained through the arrangement of a cam 25 which should be conveniently turned and which would raise the extremity of the lever 7.

The restoring of the circuit closing position can also be obtained by means of the lock.

When acting on the cam member 24 through the medium of the rod 18 the piece 4 is brought by means of the tenons 22 and 23 and of the notches 20 and 21 to the position shown in Figures 1 and 4.

Meanwhile the extremity of the nose of the lever 7 slides on the helical plane 9 and falls down to the retaining position of the piece 4.

The same result could be obtained through the arrangement of a stop 26 resting on the end of the sloping plane.

Thus an opening and a closing of the circuit under the control of a key are obtained as well as an interruption of the circuit which is automatically effectuated under the action of a shock regardless of the direction of the said shock and it is also possible to provide the arrangement on the interrupting blade of a stop 27 for limiting the movement of this blade, this stop being so arranged that it can be used for automatically grounding any auxiliary circuit such as, for instance, the primary circuit for the ignition in a magneto.

Such a stop permits stopping of the engine through grounding an ignition current supplied by a magneto.

It is possible, by bending the spring 13, to adjust the inertia stress which is necessary for the operation of the automatical device, so that the latter cannot operate under the action of the brakes or when the car is briskly accelerated.

It is also possible to provide the closing of the circuit of an electrical servo-brake of a known type by the switch in its released position so that it is impossible to haul the car when the electric circuit of the car battery has been interrupted and when the braking action limits the destructing effects of the shock in the case of an accident.

Such a device can be located either under the floor of the car so that the axis 16 remains in a vertical position or in any other manner either vertically or obliquely and, for instance, on the dashboard of a vehicle.

In this latter case the shifting movement of the stop 10 can be transmitted by any known means as, for instance, a bell crank lever or the like, and any useful form can be given to the lever 7.

Of course, the form of the casing (not shown), the details of execution, the details of the arrangement for securing or guiding the various pieces may be varied without departing from the scope of the invention; thus, more particularly, the spring 5 can be replaced by a spiral spring, the stop 6 can be made in any known manner and many types of different locks can be used.

The invention can be used for the interruption of any circuit or for closing any safety circuit which electrically controls a member such as a brake, or the closing of a petrol cock and the like.

The invention can be used on any vehicle as well as for vessels, boats, aircrafts and the like.

I claim:

1. A safety switch comprising a resilient contact, a rockable spring-operated cam keeping said contact in its closed position having on its top face a central bore, diametrally opposite notches and a helical cam, a locking lever with a nose engaging the end of the helical cam, a key-barrel with a centering extension engaging said central bore, tenons engaging said notches with play and a recess in said barrel engaged by the nose of said locking lever, shiftable spring-returned means for disengaging said locking lever, and a pendulum for actuating said shiftable means.

2. A safety switch comprising a resilient contact, a rockable spring-operated cam keeping said contact in its closed position having on its top face a central bore and a helical cam, a locking lever with a nose engaging the end of the helical cam, a key-barrel with a centering extension engaging said central bore, a helical cam surface on said barrel engaging the nose of said locking lever, a stop integral with the barrel engaging the end of said helical cam, shiftable spring-returned means for disengaging said locking lever, and a pendulum for actuating said shiftable means.

3. A safety switch comprising a fixed contact, a flexible blade carrying a contact piece, a rockable spring-operated cam keeping said blade in its contact closing position having on its top face a central bore and a helical cam, a locking lever with a nose engaging a recess of said cam, a key barrel with a centering extension engaging said central bore and means engaging said cam for returning the cam to its contact closing position, a half-sphere seated in a semi-spherical socket, a pendulum comprising a weight attached by a rod to the pole of the sphere opposite the sectional plane of the same adapted to swing about the center of the sphere, and a spring-returned piston resting on said sectional plane for disengaging said locking lever.

4. In a safety switch for breaking the electrical circuits of a motor car, comprising a resilient contact, spring-returned contact closing means keeping said contact in its closed position and latching means for said contact closing means, a cam carried by the contact closing means and cooperating with said latching means to guide the latter to latching position, a half-sphere seated in a semi-spherical socket, a pendulum comprising a weight attached by a rod to the pole of the sphere opposite the sectional plane of the same adapted to swing about the center of the sphere, a spring-returned piston resting on said sectional plane adapted to disengage said latching from said cam of the contact closing means, and key-actuated means for returning said contact closing means to contact closing position.

FRANÇOIS HORNAIN.