

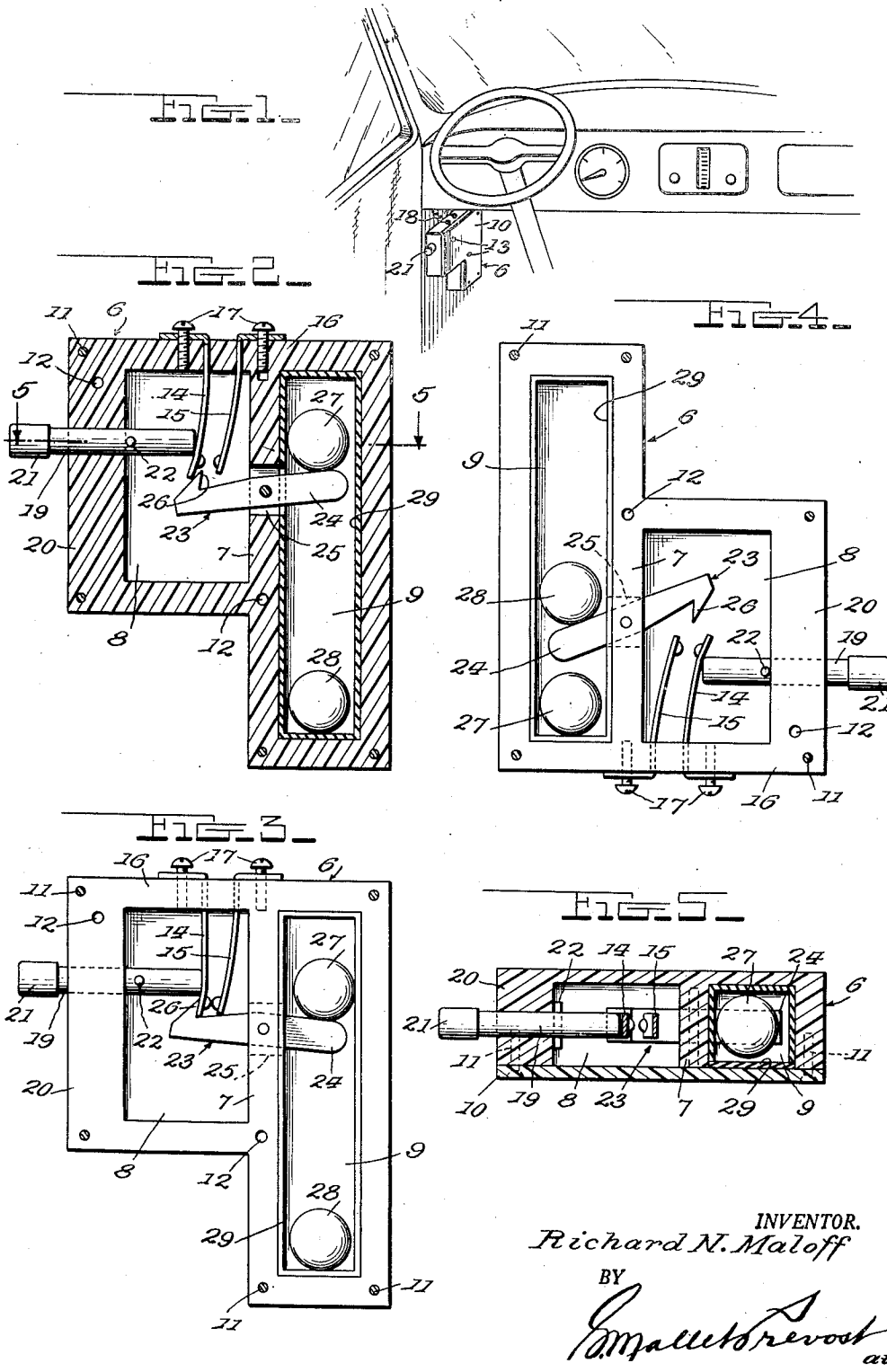
June 30, 1953

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2,644,051

AUTOMATIC SAFETY SWITCH

Filed Jan. 2, 1952



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UNITED STATES PATENT OFFICE

2,644,051

AUTOMATIC SAFETY SWITCH

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Application January 2, 1952, Serial No. 264,525

9 Claims. (Cl. 200—52)

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This invention consists in new and useful improvements in an automatic safety switch for use in connection with motor vehicles and the like, to prevent fire in the event the vehicle is overturned as the result of an accident.

The primary object of the invention is to provide a safety switch unit which may be very simply installed in any vehicle and including a pair of contacts adapted to be interposed in circuit with the conventional ignition system, gravity responsive means being provided for normally maintaining the contacts in circuit-closing position and, upon the accidental overturning of the vehicle, to automatically disengage said contacts and break the circuit of the ignition system.

Another object of the invention is to provide a switch unit of this character including manually operated means for initially setting said contacts in circuit-closing position and having a separate latch device, movable into latching engagement with said contacts by a gravity responsive element, disposed to maintain said latching engagement under normal conditions, said latching device being movable to latch-releasing position by a second gravity responsive element which is normally inactive but operable upon the overturning of the vehicle, to release said latch.

A further object of the invention is to provide a switch unit of the nature referred to, wherein the operating arm of the latch device is interposed between two gravity responsive elements and arranged in line for engagement by one or the other thereof, depending upon the position of the vehicle.

With the above and other objects in view which will appear as the description proceeds, my invention consists in the novel features herein set forth, illustrated in the accompanying drawings and more particularly pointed out in the appended claims.

Referring to the drawings, in which numerals of like character designate similar parts throughout the several views:

Figure 1 is a perspective view showing my improved safety switch unit installed at the preferred location under the dashboard of a motor vehicle;

Figure 2 is the vertical sectional view through the housing of the unit, showing the contacts prior to being closed by the manual setting device;

Figure 3 is a view in side elevation, with the closure removed and showing the contacts in normally closed position;

Figure 4 is a similar view with the housing in

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overturned position, as if the vehicle were overturned and showing the contacts in open or circuit-breaking relation, and

Figure 5 is a transverse sectional view taken on line 5—5 of Figure 2.

The form of my invention illustrated in the accompanying drawings comprises a main housing 6, preferably composed of any suitable transparent plastic material and divided internally by a vertical partition 7, into a contact chamber 8 and a vertically elongated ball or weight-containing chamber 9. The entire housing, including the partition 7, may be formed integral, with the exception of the outer side wall or closure 10 which, as shown in Figure 5, consists of a separate sheet of plastic adapted to be removably secured in place over the chambers 8 and 9, by screws or the like 11. At selected points, the walls of the housing 6 are drilled as at 12, to accommodate screws 13 for securing the unit in place at a convenient location under the dashboard of a vehicle, as shown in Figure 1.

A pair of spring contacts 14 and 15 are inserted through complementary slots in the top wall 16 of the housing, with their bases secured in place on the outer side of the wall by terminals 17 which are screwed into the wall and serve the added purpose of connecting the device in circuit with the ignition system, through leads 18 as shown in Figure 1. The free ends of the contacts 14 and 15 terminate within the contact chamber 8 and the contact 14 is under a normal spring tension, tending to urge its contact end away from the corresponding end of contact 15, as shown in Figure 2, so that unless the contacts are positively locked in engagement, as later described, the ignition system is broken.

The contacts are set in circuit-making position by means of a manually operated push rod 19 which is slideably mounted in a suitable opening in the outer wall 20 of the housing, with one end projecting into the contact chamber 8, in line for engagement with the retracted contact 14. The outer end of the push rod is preferably enlarged as at 21, to serve as an operating button or knob and, as the rod is freely mounted in the housing wall, a transverse stop pin 22 is inserted therein at the proper point, to define the limit of outward movement of the push rod when the contacts 14 and 15 are disengaged.

Under normal conditions the contacts 14 and 15 are locked in circuit-making engagement by means of a latch device 23, which consists of an arm 24, transversely pivoted in an opening 25 in partition 7. One end of the arm 24 lies

in the contact chamber 8, adjacent the free ends of the contacts 14 and 15 and carries an upwardly directed, angularly disposed catch 26, for engagement with contact 14, when the latter is moved into circuit-making position. The other end of the arm 24 extends into the ball chamber 9 and terminates short of the opposite wall thereof so as to permit freedom of movement of the arm about its transverse pivot in partition 7. The latch device 23 and its parts are preferably integral in structure and may be composed of plastic or other suitable non-conducting material.

Chamber 9 houses two weighted balls or the like which are freely movable therein, in response to the action of gravity and are arranged to control the making and breaking of the ignition circuit. One of these balls 27, is disposed in the upper portion of the chamber 9 and normally rests upon the latch arm 24, exerting thereon sufficient downward force to rock the arm on its pivot, urging the opposite end of the arm which carries the lock 26, upwardly into engagement with the contacts 14 and 15. Unless the push rod 19 has been forced inwardly, the latch device has no effect and the contacts 14 and 15 remain disengaged as in Figure 2. However, upon manipulation of the push rod 19, the contact spring 14 is forced into engagement with contact 15, whereupon the weight of the ball 27 causes the arm 24 to rock catch 26 into effective position to lock the contacts in circuit-closing engagement as in Figure 3. The weight of the ball 27 together with the angular disposition of the catch 26, maintains this position so long as the vehicle remains in a normal upright position.

The second weighted ball or the like 28, rests freely on the floor of the chamber 9, below the latch arm 24 and normally remains idle. However, in the event of an accident in which the vehicle may be turned upside down or on its side, the ball 28 is caused to roll toward the opposite end of chamber 9 and when it strikes the arm 24 the latch device is rocked on its pivot, automatically releasing the catch 26 as shown in Figure 4, and immediately breaking the ignition circuit.

The balls 27 and 28 are preferably in the form of conventional steel ball bearings, although they may be composed of any material having sufficient weight to actuate the latch arm in response to gravity.

In the form of the invention illustrated, the balls are steel ball bearings and in order to avoid a rattling noise within the chamber 9, during motion of the vehicle, I preferably line the side walls and ends of the chamber with strips 29 of rubber or other noise-absorbing material. This same effect may be obtained however, by the use of noise-absorbing coverings for the balls instead of lining the chamber.

It will thus be seen that I have provided a very simple and efficient safety switch which is easy to install and positive in its operation and one which may be economically manufactured.

From the foregoing it is believed that my invention may be readily understood by those skilled in the art, without further description, it being borne in mind that numerous changes may be made in the details disclosed, without departing from the spirit of the invention as set forth in the appended claims. For example, while I have shown and described this device as connected in circuit with the ignition system,

it will be understood that it can be so installed as to automatically disconnect all electrical circuits in the vehicle in the event of an accident.

I claim:

1. An automatic safety switch device for motor vehicles and the like, comprising a pair of contacts adapted to be connected in circuit with an ignition system, at least one of said contacts being normally under a disengaging tension, tending to break said circuit, manually operated means for closing said contacts to complete said circuit, a latch element including a pivoted operating arm, carrying at one end, a catch adapted to engage said tensioned contact, upon the rocking of said arm on its pivot, to lock the contacts in circuit-making position, the opposite end of said operating arm projecting into a closed chamber, a gravity responsive member in the upper portion of said chamber above said arm and normally resting upon the latter to exert thereon a downward force for maintaining the locking engagement of said catch, and a second gravity responsive member in the lower portion of said chamber below said arm, normally out of contact with the latter but capable of movement into contact therewith, through the force of gravity, upon the overturning of said chamber, whereby said arm is rocked in the reverse direction to release said catch and permit the breaking of said circuit, by the retraction of said tensioned contact.

2. An automatic safety switch device for motor vehicles and the like, comprising a support, a pair of contacts carried by said support, at least one of which is normally under a spring tension to disengage the other contact, manually operable means for urging said contacts into engagement, a casing carried by said support and having a slotted wall adjacent said contacts, a latch member comprising an arm, pivotally mounted on said casing wall with one end extending through the slot and terminating within the casing, its opposite end having a latch device adapted, when elevated, to lock said contact elements in engagement, a first gravity responsive element disposed in the upper portion of said casing below said latch arm and normally out of contact therewith, but moveable through the force of gravity, into engagement with said arm, upon the over-turning of said support and casing, whereby said arm is rocked in the reverse direction to release said latch device and permit the retraction of said tensioned contact.

3. An automatic safety switch device for motor vehicles and the like, comprising a casing, a vertical partition in said casing, dividing the latter into a contact compartment and a control compartment, means for mounting said casing in a vehicle with the control compartment in a normally upright position, a pair of contacts in said contact compartment, one of said contacts being normally under a retracting tension, tending to disengage the contacts, manually operable means for urging said tensioned contact into engagement with the other, a latch element for locking said contacts in engagement and comprising an arm pivotally mounted in a slot in said partition, with opposite ends lying in respective compartments, a catch on the end of said arm in the contact compartment and arranged in line for movement into locking engagement with said contacts, and gravity responsive means in said control compartment, coacting with the opposite end of said arm to normally maintain the locking engagement of said catch, but operable

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upon the overturning of said casing, to rock the latch arm and release the catch, whereby the retraction of said tensioned contact is permitted.

4. An automatic safety switch device as claimed in claim 3 wherein said gravity responsive means comprises two weighted balls, one above and one below said latch arm.

5. An automatic safety switch device as claimed in claim 3, wherein said manually operable means for urging the tensioned contact into engagement with the other contact comprises a push rod, slidably mounted in one wall of said casing.

6. An automatic safety switch device as claimed in claim 4 wherein the walls of said control compartment are lined with noise-absorbing material to prevent direct contact by said balls.

7. An automatic safety switch as claimed in claim 4, including noise-absorbing means for preventing direct contact between the balls and the walls of the control chamber.

8. An automatic gravity controlled circuit maker and breaker for motor vehicles and the like comprising a switch, normally tensioned for disengagement and adapted to be connected in circuit with the ignition system of a vehicle, manually operated means for closing the switch and a gravity responsive unit associated with the switch and including a switch control element, a first floating weight, associated with said ele-

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ment and operable therethrough, in the normally upright position of the unit, to maintain the switch in closed condition, and a second floating weight, associated with said element and operable through the force of gravity, when the unit is overturned, to cause the opening of said switch.

9. An automatic circuit maker and breaker assembly for motor vehicles and the like, comprising a switch normally tensioned for disengagement and adapted to be connected in circuit with the ignition system of a vehicle, manually operated means for closing the switch, a latch arm for maintaining the switch in closed condition, weighted means coacting with said latch arm through the force of gravity to control the position of the latter, said last named means comprising separate, floating weights arranged on opposite sides of said latch arm and respectively engageable therewith in reverse positions of the assembly.

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