Dec. 24, 1929. W. M. S. KILGOUR 1,740,896

MOTOR VEHICLE SAFETY DEVICE

Original Filed Feb. 26, 1927 2 Sheets-Sheet 1

Fig. 1.

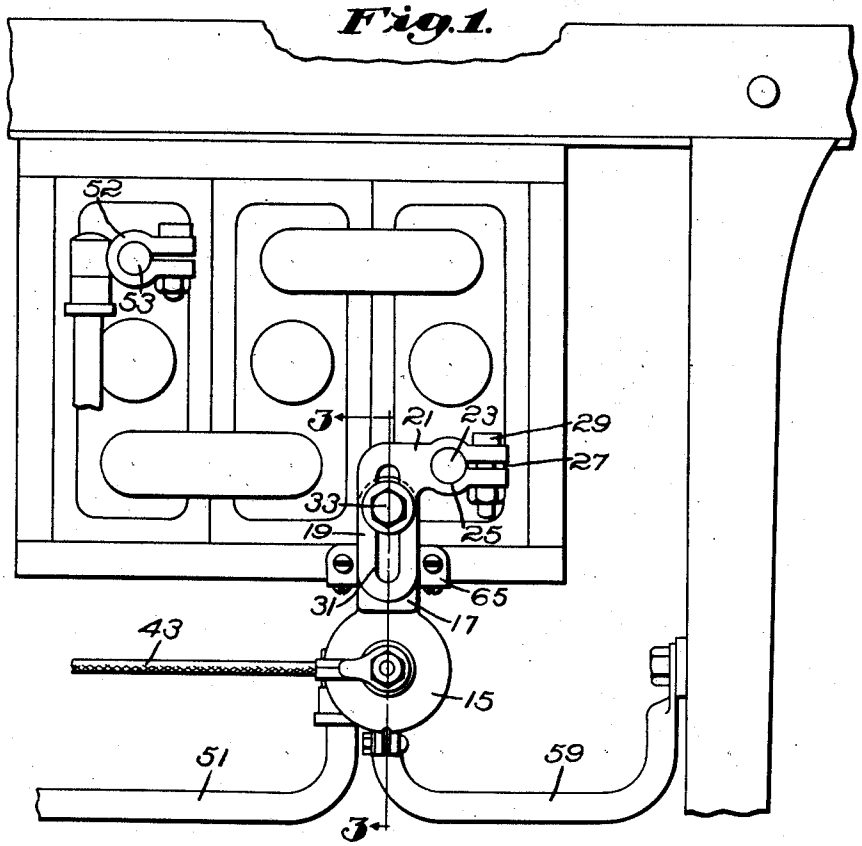


Fig. 2.

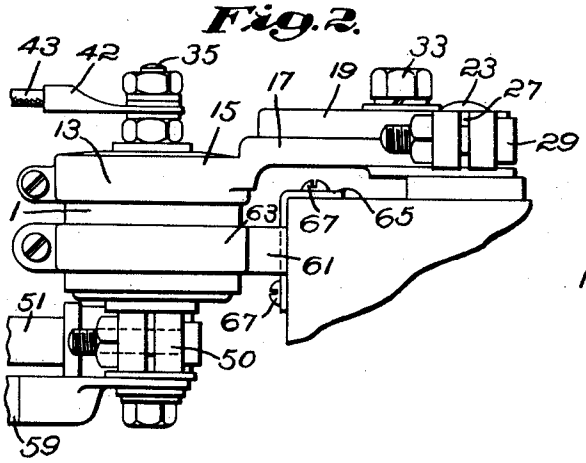
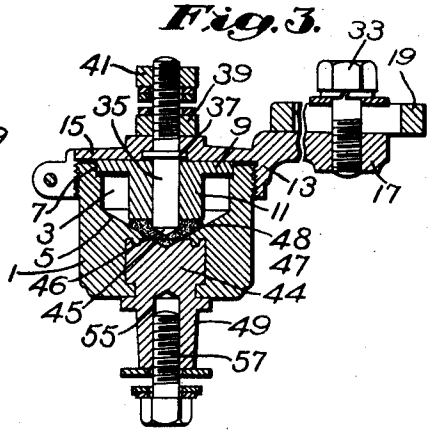


Fig. 3.



Inventor:
Walter M. S. Kilgour.
by Emery Booth Janney & Varney
Attys

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Fig. 4.

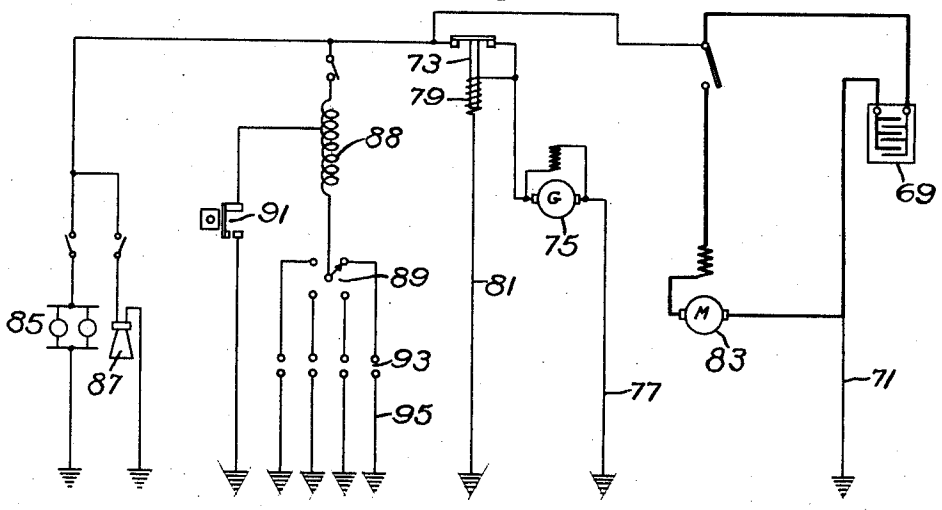
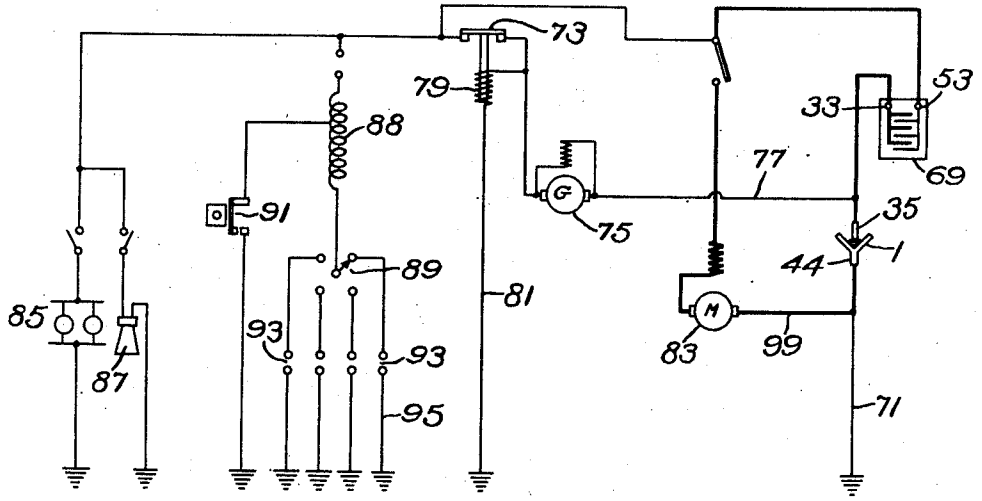


Fig. 5.



Inventor:
Walter M. S. Kilgour;
By Emery Booth Janney & Varney
Attys.

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UNITED STATES PATENT OFFICE

WALTER M. S. KILGOUR, OF LEXINGTON, MASSACHUSETTS

MOTOR-VEHICLE SAFETY DEVICE

Original application filed February 26, 1927, Serial No. 171,185. Divided and this application filed June 2, 1928. Serial No. 282,482.

This application is a division of my pending application Serial No. 171,185, filed February 26, 1927.

The invention relates to internal combustion engine driven motor vehicles, and is particularly but not exclusively concerned with the elimination of the fire hazard incident to collisions.

The invention will be best understood from the following description when read in the light of the accompanying drawings of an embodiment of the invention, while the scope of the invention will be more particularly pointed out in the appended claims.

In the drawings:—

Fig. 1 is a plan view of a storage battery equipped with a circuit breaker constructed according to my invention;

Fig. 2 is an elevation looking from the right of the apparatus as viewed in Fig. 1 with parts omitted and broken away;

Fig. 3 is a section on the line 3—3 of Fig. 1 with parts omitted; and

Figs. 4 and 5 are schematic wiring diagrams of the electrical systems of motor vehicles.

Referring particularly to Figs. 1, 2 and 3 the circuit breaker shown has the same general construction as that shown in United States Patent No. 1,588,459, granted to me June 15, 1926. Herein this circuit breaker comprises a body 1 formed of suitable insulating material, as for example bakelite. As illustrated, the body is provided with an interior chamber 3 the bottom wall 5 of which is shown as of conical formation, the sides of said bottom when viewed in profile preferably being straight lines. As illustrated the upper edge of the interior chamber is enlarged at 7 to receive a flange 9 which preferably is of the same material as the body 1 and has formed integrally therewith a downwardly projecting boss 11. Exteriorly the upper end of the body is shown as screw threaded into the socket formed by the peripheral flange 13 of a cover 15 which may be of conducting material and may have formed integrally therewith an arm 17 carrying a section 19 with a laterally offset portion 21 for engagement with the terminal lug 23 of a storage battery. Herein the offset portion 21 is perforated at 25 for receiving the terminal lug and is split at 27 and provided with a bolt 29 for clamping it to the terminal lug. As illustrated the section 21 is provided with a longitudinally extending slot 31 through which passes a bolt 33 screw threaded into the section 15. This construction in an obvious manner provides that the offset portion 21 may be adjusted relative to the body 1 to adjust the device to different batteries.

As illustrated, extending through aligned perforations in the cover 15, flange 9, and boss 11 is a terminal member 35 provided intermediate its ends with a collar 37, the portion of the member above the cover 15 being screw threaded and carrying a nut 39 for drawing the collar against the cover. As shown the screw threaded portion of the terminal carries a second nut 41 for securing thereto the terminal lug 42 of a conductor 43.

As illustrated, embedded in the bottom wall of the body 1 is a second terminal member 44, the upper face of which is dished out at 45 to form the apex of the conical bottom surface 5 of the chamber 3, the lower end of the terminal 35 preferably having a conical end face 46 the surface of which is parallel to and coaxial with said surface 5. As shown the chamber 3 contains a globule of mercury 47 which normally establishes electrical communication between the two terminals. When the body is tilted so as to move one of the profile lines defining the conical bottom of the chamber past the horizontal the mercury will move as a globule suddenly away from the terminals 35 and 44 to interrupt the electrical communication between them. Conveniently the parts are so constructed that the lower edge of the boss 11 in conjunction with the conical surface of the bottom of the chamber 5 provides a restricted annular passage, while the lower face of the boss forms a baffle for the mercury. I have found that with this construction breaking of the circuit is avoided when the vehicle is subjected to severe jars.

As shown the lower projecting portion of the terminal 44 is provided with a portion 49 for receiving the terminal lug 50 of a conduc-

tor 51, this terminal lug being similar to that illustrated at 52 in engagement with the opposite terminal 53 of the storage battery. The terminal portion 49 is shown as provided with an axially screw threaded hole 55 which receives the screw threaded shank of a bolt 57 for securing a second conductor 59 to the portion 49.

If desired the body 1 may be braced by means of a bracket 61, the latter having a portion 63 clamped about the body and the angle base 65 engaging the adjacent faces at an edge of the casing of the battery, and if desired this base may be secured to said casing by screws 67.

It will be understood that if the vehicle is tilted past a predetermined angle the electrical connection between the terminal 23 of the battery and the conductors 51 and 59 will be interrupted as above described. Either or both of these conductors may be utilized, depending upon the particular wiring system of the vehicle to which the circuit breaker is applied. As a result upsetting or other tilting of the vehicle incident to a collision or similar accident will prevent the battery causing fires incident to short circuits if the wiring or electrical instrumentalities of the vehicle are deranged by the collision. Although I have shown the circuit breaker placed close to the terminal of the battery so as to reduce the fire hazard to a minimum it will be understood that it may be placed in other convenient positions, particularly when the battery is so installed as not to permit the arrangement according to Figs. 1 and 2.

In Fig. 4 I have shown a schematic diagram of a common manner of wiring the electrical instrumentalities of an internal combustion engine driven motor vehicle, while in Fig. 5 I have shown schematically the same arrangement of apparatus with one way of applying the circuit breaker to reduce the fire hazard.

Referring to Figs. 4 and 5 I have shown the storage battery 69 with one terminal grounded, say to the vehicle frame, by a lead 71, while the opposite terminal is connected through a relay switch 73 to one terminal of a charging generator 75, the other terminal of this generator being grounded by the lead 77. The relay switch 73 may be of a known type which includes a high resistance winding 79 or its equivalent shunted around the terminals of the generator by connections including a grounded lead 81, so that when the generator reaches a sufficient speed it will close the switch 73 which is normally urged by spring means (not shown) toward open position.

Also shunted around the generator and storage battery are shown a starting motor 83 and the various electrically operated accessories of the vehicle exemplified by the lamps 85 and horn 87. The ignition system, which likewise is shunted around the terminals of the generator and battery, herein comprises the transformer 88, distributor 89, interrupter 91, and spark plugs 93, one terminal of each of the spark plugs being grounded in the usual manner as is schematically illustrated by the grounded leads 95.

It will be observed that if a vehicle wired according to Fig. 4 should upset the generator could energize the ignition circuit, with the result that the engine and consequently the generator could be operated until the gasolene in the carburetor were consumed even if the storage battery were disconnected from the circuit, in which case short circuits in the wiring or electrical apparatus could result in fire by reason of the energy delivered by the generator. To prevent this the vehicle may be wired as shown in Fig. 5 with the circuit breaker according to Figs. 1, 2 and 3 installed as indicated at 1, in which case the lead 77 instead of being connected to the ground may be connected to the terminal 35 of the circuit breaker, which latter is connected to the storage battery. With this arrangement the leads 71 and 77 respectively correspond to the conductors 51 and 43 of Figs. 1 and 2, while the lead 99 connecting the starting motor to the battery corresponds to the conductor 59 of those figures. It will be understood of course that the lead 99 if desired instead of being connected to the circuit breaker may be grounded to the frame of the vehicle.

It will be observed that with the arrangement of wiring and apparatus according to Fig. 5 opening of the circuit breaker will prevent the generator energizing the ignition circuit, with the result that the engine and hence the generator will be rendered inoperative; also that when the circuit breaker opens the generator circuit at the same time it opens the battery circuit, and therefore that it is impossible for any of the electrical instrumentalities of the vehicle to be energized when the vehicle is tilted past the angle which causes opening of the circuit breaker.

Although I have described for purposes of illustration a particular form of circuit breaker and one electrical system including the same, it will be understood that wide deviations may be made from these embodiments of the invention without departing from the spirit of the invention.

Claims:

1. A circuit breaker comprising, in combination, a chambered body of insulating material having a conical bottom wall, a terminal at the apex of said wall, a terminal in said chamber above said apex, said chamber for containing a globule of mercury for establishing electrical communication between said terminals, a cover of conductive material for said chamber, said cover supporting said last mentioned terminal and being in elec-

trical communication therewith, and means for attaching a conductor to said cover.

2. A circuit breaker having, in combination, a hollow body containing electrical contacts normally placed in electrical communication by a body of mercury in said body, an arm extending laterally from said body, said arm being in electrical communication with one of said contacts, and means for attaching said arm to the terminal post of a storage battery.

3. A circuit breaker having, in combination, a hollow body containing electrical contacts normally placed in electrical communication by a body of mercury in said body, an extensible arm extending laterally from said body, said arm being in electrical communication with one of said contacts, and means for attaching said arm to the terminal post of a storage battery.

4. A circuit breaker having, in combination, a hollow body of insulating material containing electrical contacts normally placed in electrical communication by a body of mercury in said body, said body having a cover of conductive material carrying one of said contacts, and a laterally extending arm formed integrally with said cover and having provision for attachment to the terminal post of a storage battery.

5. A circuit breaker having, in combination, a hollow body of insulating material containing electrical contacts normally placed in electrical communication by a body of mercury in said body, said body having a cover of conductive material carrying one of said contacts, and an extensible laterally extending arm formed integrally with said cover and having provision for attachment to the terminal post of a storage battery.

6. A circuit breaker comprising, in combination, a chambered body of insulating material having a conical bottom wall, a terminal at the apex of said wall, a terminal in said chamber above said apex, said chamber for containing a globule of mercury for establishing electrical communication between said terminals, a cover of conductive material for said chamber, said cover supporting said last mentioned terminal and being in electrical communication therewith, and supporting means for said circuit breaker having provision for attaching said cover to the terminal of a storage battery, said last mentioned means placing said cover in electrical communication with said storage battery terminal.

In testimony whereof, I have signed my name to this specification.

WALTER M. S. KILGOUR.