May 22, 1951 J. E. HARMON 2,553,708

INERTIA OPERATED CIRCUIT BREAKER

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Fig. 1.

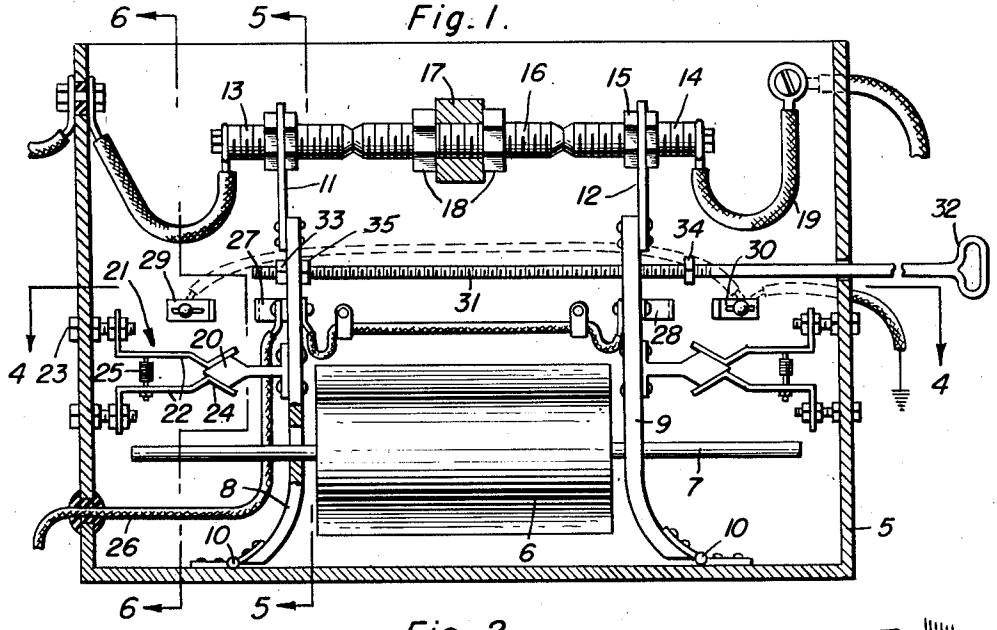
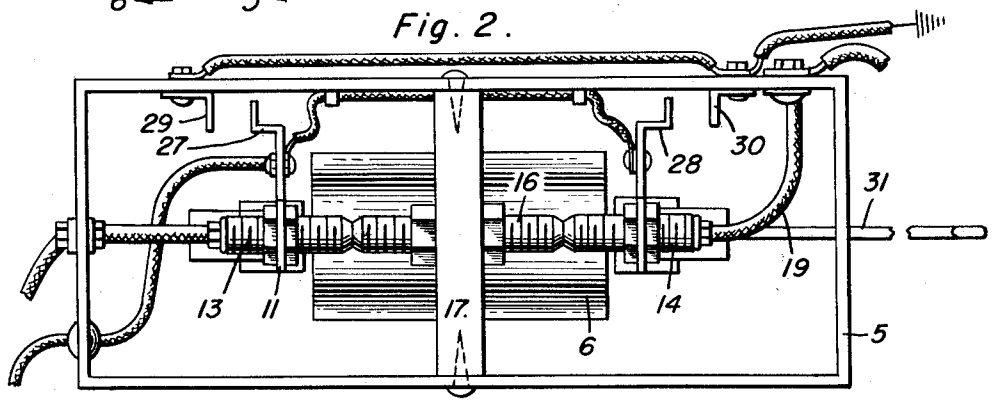


Fig. 2.



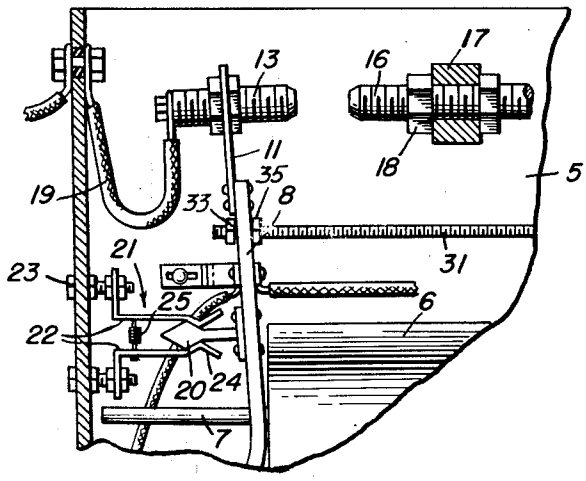


Fig. 3.

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Fig. 4.

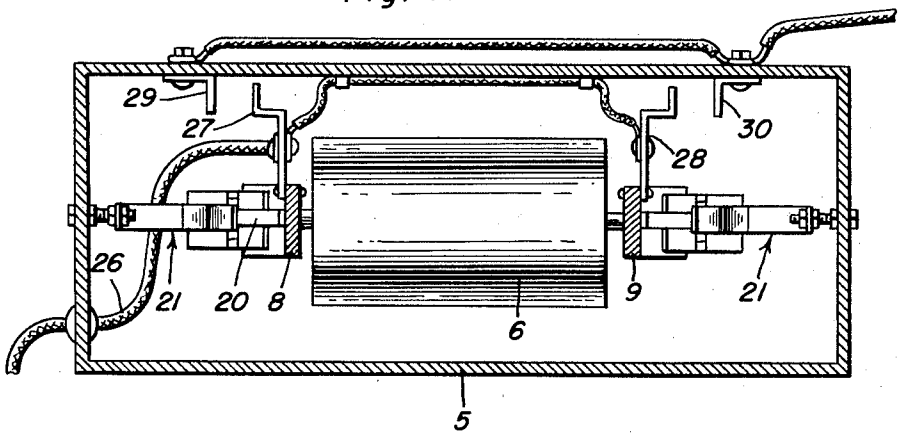


Fig. 5.

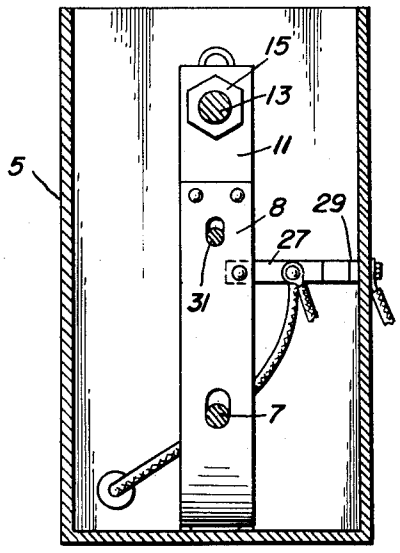


Fig. 6.

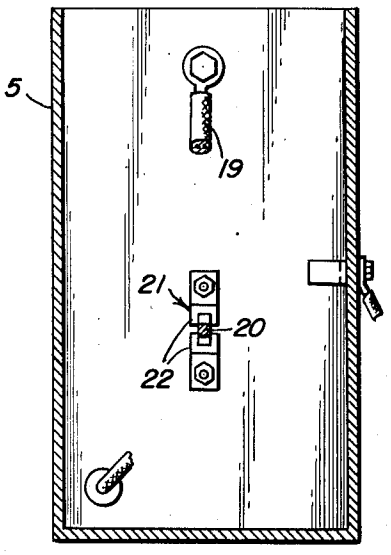
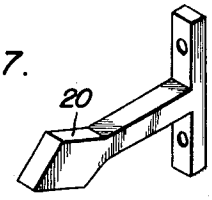


Fig. 7.



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INERTIA OPERATED CIRCUIT BREAKER

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Application February 21, 1949, Serial No. 77,614

6 Claims. (Cl. 200—52)

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The present invention relates to new and useful improvements in inertia operated circuit breakers and more particularly to an automatic cut-off switch for the electric systems of various types of crafts and vehicles.

An important object of the invention is to provide a cut-off switch for the battery cable of a vehicle as well as a cut-off switch for the electric system for a magneto or generator of the vehicle whereby to simultaneously ground the out-put line of both the battery and the magneto or generator by a sudden interruption to the momentum of the vehicle, as by an accident or collision of the vehicle.

In the usual electrical system of a motor vehicle, aircraft or the like, after the engine has been started by a battery, the same may continue to operate should the battery be cut-off, such as by a conventional safety switch and it is accordingly an object of the present invention to provide an inertia operated cut-off switch which will cut-off the electric system controlled by a magneto or generator as well as to cut-off the battery to more effectively reduce the hazard of fire should an accident occur while driving the vehicle.

A further object is to provide a device of this character of simple and practical construction, which is efficient and reliable in operation, relatively inexpensive to manufacture and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a longitudinal sectional view of the housing for the dual battery and generator or magneto cut-off switches;

Figure 2 is a top plan view;

Figure 3 is a fragmentary sectional view showing one end of the dual switches in cut-off position;

Figure 4 is a longitudinal sectional view taken on a line 4—4 of Figure 1;

Figures 5 and 6 are transverse sectional views taken respectively on the lines 5—5 and 6—6 of Figure 1; and

Figure 7 is a perspective view of one of the catches for locking the switches in an open or circuit grounding position.

Referring now to the drawings in detail, wherein for the purpose of illustration I have disclosed

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a preferred embodiment of my invention, the numeral 5 designates a housing which may be open at its top and suitably secured behind the instrument panel of a motor vehicle (not shown).

A weight 6 is provided with rods 7 projecting from opposite ends and slidably supported in front and rear supports 8 and 9 of insulation material and which are hinged at their lower ends as at 10 in the bottom of housing 5 for forward and rearward swinging movement.

Resilient arms 11 and 12 extend upwardly from supports 8 and 9 in which contacts 13 and 14 are threadedly adjusted by nuts 15, one end of the contacts being normally held in engagement with the adjacent end of a stationary contact 16 threaded in a supporting bar 17 of insulation material fixed to the sides of housing 5 and secured in adjusted position by nuts 18.

The front and rear contacts 13 and 14 are connected in a battery cable 19 at the positive or out-put side thereof.

A spear-headed catch 20 is secured to each front and rear support 8 and 9 for engaging resilient keepers designated generally at 21 and each comprising a pair of resilient arms 22 secured in spaced parallel relation to each other by bolts and nuts 23 secured to an adjacent wall of housing 5, the free ends of the arms 22 having zig-zag or opposed V-shaped jaws as shown at 24 and between which the heads of catches 20 enter to lock the catches in the keepers. Coil springs 25 connect the pairs of arms 22 to each other to hold the catches in locked position.

A magneto or generator grounding wire 26 leads from the positive terminal of a magneto or generator (not shown) of the motor vehicle and is connected to contacts 27 and 28 projecting laterally from supports 8 and 9, the stationary contacts being connected to a suitable ground.

A pair of stationary contacts 29 and 30 are secured to an adjacent wall of housing 5 in the path of contacts 27 and 28 respectively during rearward movement of support 8 and forward movement of support 9 to ground the magneto or generator circuit.

In the operation of the device, the contacts 13 and 14 are adjusted to maintain contact with stationary contact 16 during normal operation of the vehicle to keep the circuit for the battery cable 19 closed the contacts being held in the normal operation position as shown in Figure 1 by catches 20 held against the outwardly diverging ends of jaws 24.

Should the momentum of the vehicle suddenly be arrested, such as caused by a collision, the

arresting of the forward motion of the vehicle will cause weight 6 to slide forwardly to force front support 8 forwardly, locking catch 20 in jaws 24 of front keeper 21 and moving front contact 13 forwardly to open the battery circuit with stationary contact 16 and closing front contact 27 with contact 29 to ground magneto or generator circuit wire 26.

Both the battery and the magneto or generator of the vehicle are thus simultaneously cut-off to eliminate the hazard of fire due to a spark from the electric system.

The rear contacts 14 and 28 are similarly operated by a sudden stopping in a rearward movement of the vehicle.

The catches 20 hold the contacts in their safety positions and are released by a resetting rod 31 slidably mounted in the rear wall of housing 5 with a handle 32 at its rear end and also slidably positioned in supports 8 and 9. Collars 33 and 34 are adjustably secured on rod 31 to engage the respective supports to pull support 8 rearwardly by a rearward movement of resetting rod and to push support 9 forwardly by a forward movement of resetting rod.

A collar or nut 35 is also threaded on rod 31 at an opposite side of support 8 from collar or nut 33 and by means of which the contact 13 may be manually broken in case of a short circuit or other emergency in the wiring system and the circuit restored by pulling the resetting rod 31 after the trouble has been corrected.

Having described the invention, what is claimed as new is:

1. In a safety switch, an inertia operated device including an upstanding inertia actuated pivoted support, a plurality of independent circuit controlling members carried by the support, each of said circuit controlling members including a movable contact carried by the support and stationary contacts in the path of said movable contacts, all of said circuit controlling members being simultaneously moved into a predetermined circuit controlling position upon a predetermined movement of the support, and means locking the support in said position.

2. In a safety switch, an inertia operated device including an upstanding inertia actuated pivoted support, a plurality of independent circuit controlling members carried by the support, each of said circuit controlling members including a movable contact carried by the support and

stationary contacts in the path of said movable contacts, the movable contacts of all of said circuit controlling members being simultaneously moved into a predetermined circuit controlling position upon a predetermined movement of the support, a catch locking the support in said position, and a manually operated resetting rod connected to the support for releasing the catch.

3. In a safety switch, a pair of pivoted supports, an inertia operated body slidably supported by and working between the supports for moving one of the supports away from the other upon a movement of the body in either direction, and a plurality of independent circuit breaker members carried by each support.

4. In a safety switch, a pair of pivoted supports, an inertia operated body slidably supported by and working between the supports for moving one of the supports away from the other upon a movement of the body in either direction, a plurality of independent circuit breaker members carried by each support, a catch locking the said one support in its actuated position, and manually operated means connected to both supports for resetting the actuated support.

5. In a safety switch, a pair of pivoted supports, an inertia operated body slidably supported by and working between the supports for moving one of the supports away from the other upon a movement of the body in either direction, a plurality of independent circuit breaker members carried by each support, a catch device for each support holding the same in either its set or in its actuated position, and manually operated means connected to both supports for resetting the actuated support.

6. The combination of claim 1 wherein at least one of said contacts is adjustable relative to the other.

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