F. H. PATTEN.

CUT-OUT.

APPLICATION FILED MAY 11, 1914.

1,311,459. Patented July 29, 1919.

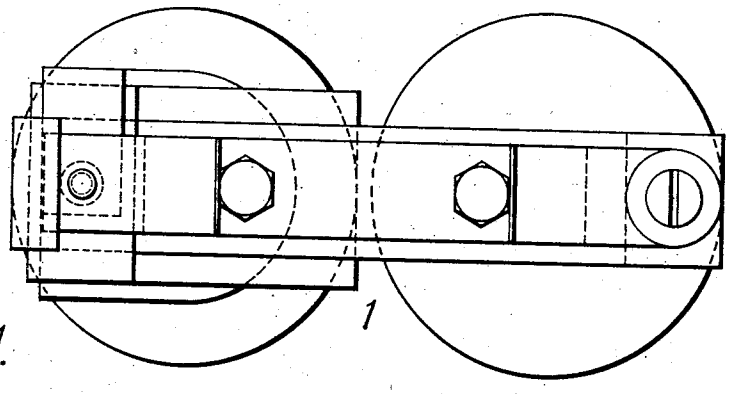


Fig. 1.

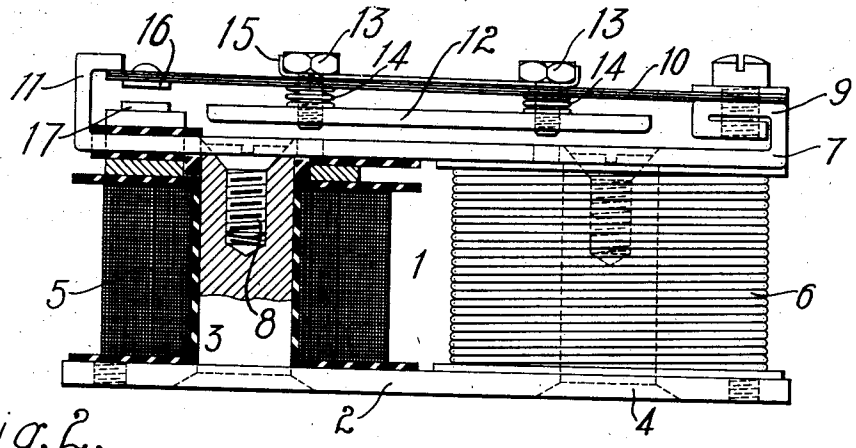


Fig. 2.

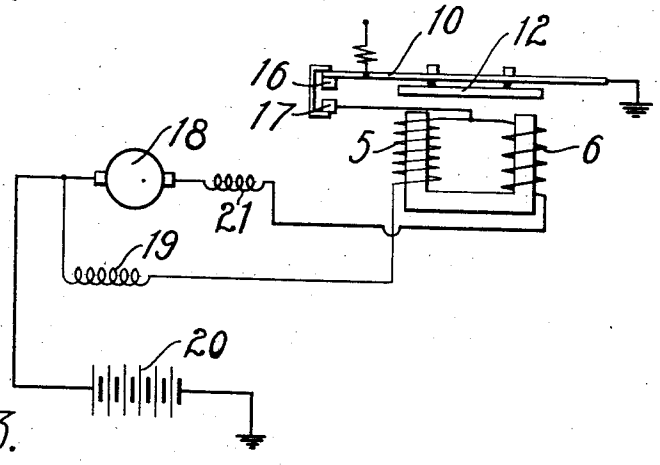


Fig. 3.

WITNESSES:

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FRANCIS H. PATTEN, OF WILKINSBURG, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC AND MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

CUT-OUT.

1,311,459. Specification of Letters Patent. Patented July 29, 1919.

Application filed May 11, 1914. Serial No. 837,737.

To all whom it may concern:

Be it known that I, FRANCIS H. PATTEN, a citizen of the United States, and a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Cut-Outs, of which the following is a specification.

My invention relates to cut outs, and it has particular reference to such mechanisms as are employed in connection with the electrical systems of automobiles or other motor vehicles.

My invention has for its object to provide a cut out which has a simple and convenient means for adjusting the voltage value at which it operates to control an electrical circuit.

I provide a cut out having an armature member which is adjustable relatively to the electromagnets that actuate the armature member to control an electrical circuit.

The details of my invention will be described in connection with the accompanying drawings in which Figure 1 is a plan view of a cut out constructed in accordance with my invention. Fig. 2 is a side view, partially in section and partially in elevation, of the cut out shown in Fig. 1. Fig. 3 is a diagrammatic view of circuits and apparatus employed in connection with my invention.

Referring particularly to Figs. 1 and 2, the cut out 1 comprises a base member 2 of magnetic material upon which are mounted core members 3 and 4 that are respectively surrounded by a coil 5 of comparatively fine wire and a coil 6 of relatively coarse wire. The coils 5 and 6 are adapted for shunt and series connection, respectively. A bar 7 of non-magnetic material is fixed to the core members 3 and 4 by screws 8 which constitute pole pieces for the core members. The bar 7 is provided, at one end, with a folded portion 9 upon which is mounted a spring 10. The bar 7 is provided at its opposite end with a hook portion 11 which limits the outward movement of the spring 10.

An armature member 12 of magnetic material, which is adjacent to the pole pieces 8, is adjustably attached to the spring 10 by means of bolts 13. Each of the bolts 13 is surrounded by a coil spring 14 which operates to maintain the armature member 12 at a distance from the spring 10 that is determined by the adjustment of the bolts 13. The bolts 13 are retained in their adjusted positions by a member 15 that has resilient ends engaging said bolts. A contact member 16, which is mounted upon, and connected to, the spring 10, coacts with a contact member 17, that is mounted upon, and is insulated from, the bar 7. The contact member 17 is connected to one terminal of each of the coils 5 and 6.

Referring now to Fig. 3, the coils 5 and 6 are respectively in shunt and in series with the armature of a dynamo-electric machine 18, the coil 5 being in series with the shunt field winding 19. These connections are made preferably within the structure of the dynamo-electric machine and form a part of its interior circuits. A storage battery 20 is connected directly to one terminal of the dynamo-electric machine, the other terminal of the battery being grounded, as shown. The contact member 16 is grounded through the spring 10, the bar 7, the core members 3 and 4 and the frame of the dynamo-electric machine.

It may be assumed that the generator 18 is operatively connected to the engine of an automobile (not shown). When the engine starts under its own power, the generator is driven at an increased speed, and current flows from one terminal of the generator through the series field winding 21, series coil 6, shunt coil 5 and shunt field winding 19 to the other terminal of the generator. As the generator speed increases, a predetermined voltage is reached at which the coils 5 and 6 are sufficiently energized to draw the armature member 12 downwardly against the tension of the spring 10 to effect the engagement of the contact members 16 and 17. The battery-charging circuit, which is thereby completed, extends from one terminal of the generator through the series field winding 21, series coil 6, contact members 17 and 16 and spring 10 to ground, and thence through the battery 20 to the other terminal of the generator. The battery 20 will be charged as long as the voltage of the generator exceeds that of the battery. In case the generator voltage falls below that of the battery, the direction of flow of current in the charging circuit will be reversed. The series coil 6, which normally assists the shunt coil 5, now opposes the latter and, as a result, the spring 10 draws the armature member 12 upwardly. The charging circuit is thus broken by the separation of the contact

members 16 and 17 and it cannot be closed again until the generator voltage has reached the predetermined value at which the cut out is adjusted to operate.

Ordinarily, the cut out will be adjusted to operate at a predetermined voltage when it is assembled at the place of manufacture. This predetermined value may, however, be varied at any time by adjusting the bolts 13 and thereby varying the position of the armature member 12 relatively to the spring 10 and the pole pieces 8.

It will be noted that I provide a switching device having a simple and convenient means for adjusting the voltage value at which it operates to control a battery-charging circuit. Various changes in the structure of my invention may be made by those skilled in the art to which my invention appertains. It is understood that such modifications may be made, without departing from the spirit of my invention, as fall within the scope of the appended claims.

I claim as my invention:

1. In a cut out, the combination with an electromagnet, of a movable member adjacent thereto, an armature member on said movable member, said armature being operated by the electromagnet, and means comprising a bolt and a spring between the movable member and the armature member for adjusting the position of said armature member relatively to said movable member and said electromagnet.

2. In a switching device, the combination with an electromagnet, and a movable armature member operated thereby, of a movable member for carrying said armature member, and means for adjusting the position of said armature member relatively to said movable member, said adjusting means comprising a plurality of screw-threaded members and a member having resilient parts.

3. In a cut out, the combination with an electromagnet and an armature member, of means for yieldingly opposing the movement of said armature member toward said electromagnet, and means for varying the voltage value at which said armature operates, said means comprising a screw-threaded member and a spring between the armature member and said opposing means for varying the normal position of said armature member relatively to said electromagnet.

4. In a cut-out, the combination with an electromagnet comprising two cores having, respectively, a series winding and a shunt winding thereon, of electrical contact members, a resilient member carrying one of said contact members and normally separating them, an armature member carried by the resilient member and disposed opposite the cores of said electromagnet, and a plurality of bolts for adjusting the position of said armature member relatively to said electromagnet.

5. In a cut-out, the combination with an electromagnet, of electrical contact members, a resilient member fixed at one end and carrying one of said contact members at its free end and normally separating said contact members, an armature, and adjustable means securing said armature to said resilient member opposite said electromagnet, said adjustable means comprising a bolt, and means for securing said bolt in its adjusted position.

6. In a switching device, an electromagnet, an armature operated by the electromagnet, a spring member for supporting the armature and for opposing the action of the electromagnet, and means comprising screw-threaded members for adjusting the position of the armature relative to the spring member and to the electromagnet.

In testimony whereof, I have hereunto subscribed my name this 30th day of April 1914.

FRANCIS H. PATTEN.

Witnesses:
C. E. WILSON,
B. B. HINES.