

Sept. 26, 1933.

W. V. SWINT

1,928,189

AUTOMATIC CUT-OUT

Filed Jan. 14, 1929

Fig. 1.

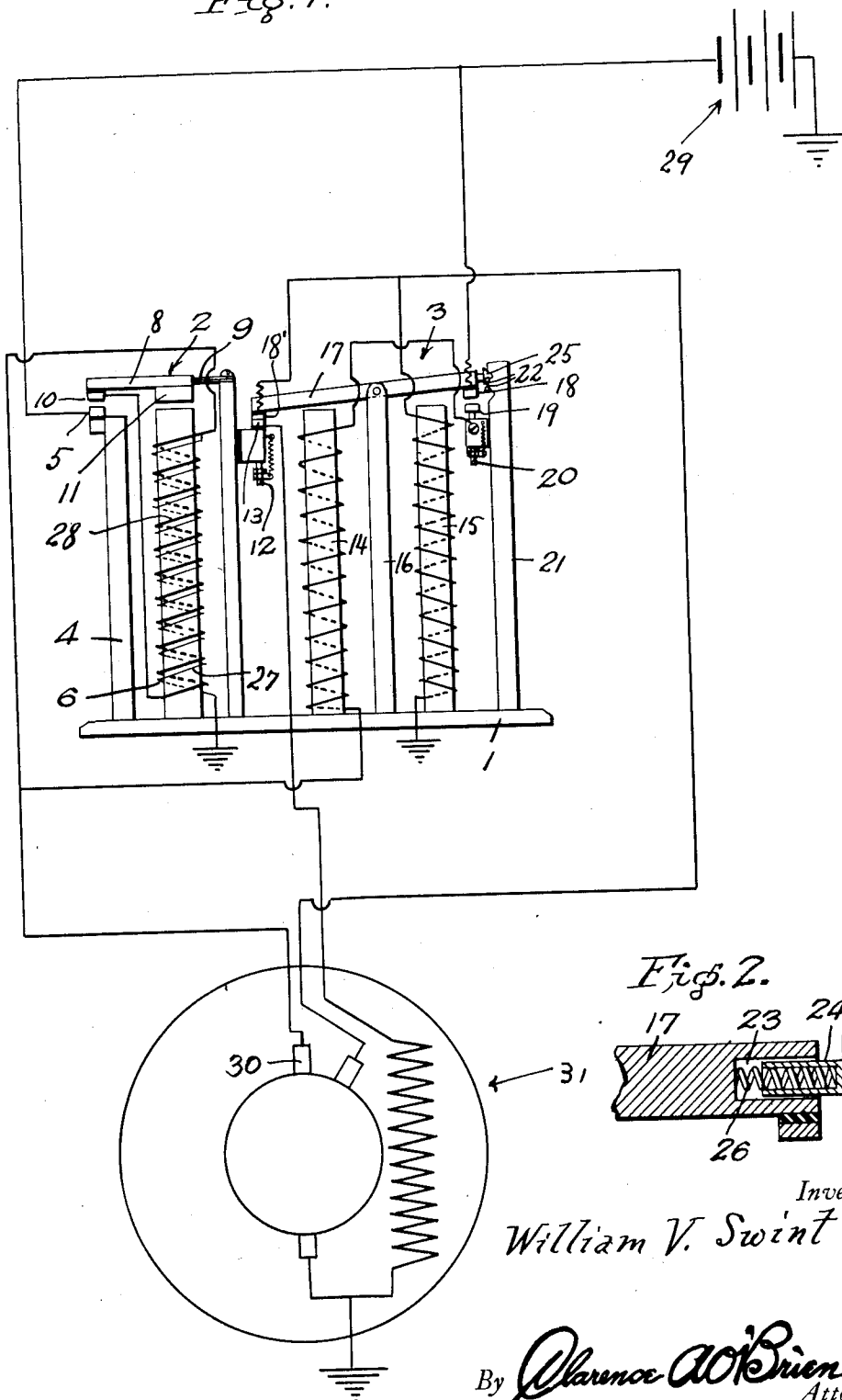
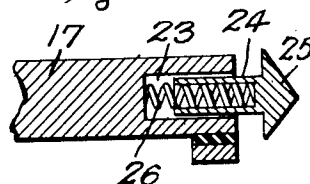


Fig. 2.



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1,928,189

AUTOMATIC CUT-OUT

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Application January 14, 1929. Serial No. 332,292

2 Claims. (Cl. 175—294)

The present invention relates to improvements in charging systems for batteries and more particularly has reference to an improvement in cut out devices, of the relay type, especially adapted for use in conjunction with a system of this character.

The main object of the invention is to provide an automatic cut-out which will operate to disconnect the generator from the battery being charged, during the occurrence of some defect in the system.

Another object of importance is to provide a cut-out device of this character which will be quick, efficient and durable in use and practically fool-proof in operation.

These and other objects of the invention will become more apparent to the reader after considering the invention as described and claimed hereinafter.

In the drawing:

Figure 1 represents the diagrammatic view of the generator, cut out and batteries, and the connections therebetween.

Figure 2 is an enlarged fragmentary sectional view of the latch means for retaining the armature of the cut out device in a position connecting the battery with the generator.

In the drawing wherein like numerals indicate like parts, a suitable base 1 is provided, and upon which at one end the usual charging relay generally referred to by numeral 2 is mounted. The improved cut out mechanism is generally referred to by numeral 3.

The relay 2 consists of a post 4 having a contact 5 mounted thereon. A coil 6 is mounted in upstanding position on the base 1, while the circuit post 7 is disposed upwardly from the base 1 at the opposite side of the coil 6. A contacting arm 8 connected to the upper end of the post 7 by a leaf spring 9 carries a contact member 10 at its free end for engagement with the contact 5. The arm 8 also carries armature block 11 in magnetic relation to the coil 6.

The cut out mechanism 3 includes a projection 12 on the post 7 having a contact 13 secured thereon. A pair of coils 14 and 15, respectively are mounted in upstanding position upon the base 1, and between these coils is the vertically disposed post 16 upon which a rocker armature 17 is mounted. The ends of the armature 17 carry contacts 18 and 18'. The contact 18' at one end of the armature is adapted to contact with the contact 13, while the contact 18 at the opposite end of the armature is adapted to contact with the contact 19 on the arm 20 projecting from the

fourth post 21. The upper side of the post 21 at its inner end is formed with a pair of notches 22, while the adjacent end of the armature 17 is provided with a bore 23 in which a tubular member 24 is slidably disposed. The member 24 has a pointed head 25 and is normally projected from the armature by means of a coiled spring 26 arranged within the bore 23 and engaged within the tubular member 24. The head 25 is adapted for engagement within the notches 22. It can be seen in the drawing that this cut-out is particularly adapted for use in conjunction with a third brush type of generator.

This device is especially designed for use in connection with the shunt wound third brush automobile generators. When the generator is being driven fast enough to charge the battery, current flows from the armature to brush 30 and from this brush it flows through the winding 27, which winding is a high resistance shunt winding, and it is grounded to the frame of the automobile.

Since the armature is grounded through field brush, this completes an electrical circuit from the armature to the brush 30 and through the winding 27, then to ground and armature through a field brush. Thus a magnet is formed of the core upon which the winding 27 is wound. This actuates the armature 8, bringing contacts 5 and 10 together.

Current then flows through winding 28 which winding is also connected to the third brush 30, thru contacts 5 and 10 and on to the battery. When the generator is being slowed down, the generator ceases to charge the battery, the magnet will give way to the spring tension, which spring is in the armature 8. Thus the contacts 5 and 10 are opened, which will prevent the battery from being discharged during the time of slow speed or idleness of the generator.

If the wire which connects the battery to the frame comes loose, which is a common occurrence, the generator will burn itself out if not prevented from doing so, and this is accomplished as follows: Since winding 15 is shunted across the field coil of the generator it will be subjected to the same voltage as in the generator. When the voltage reaches an excessive value, the core of winding 15 becomes magnetized strong enough to actuate the rocker arm 17, which armature carries at its ends contacts 18' and 18, which are adapted to seat on the contacts 13 and 19 respectively, as will be later described.

Since the field circuit of the generator is completed through contacts 13 and 18' and the actuation of the armature 17 serves to separate these

points when caused to be actuated by the magnetic influence of coil 15 the generator will cease to generate. The automobile upon which the generator is mounted will then stop running immediately as the battery cannot furnish current for the ignition since the grounding cable is off, and the generator cannot furnish current for the ignition as its field is open due to the actuation of the armature 17 by the magnetic influence of the coil 15.

When the automobile ceases running the driver will be warned of something having gone wrong. He can then replace the battery grounding cable which has this effect: When the armature 17 is actuated by coil 15, the contacts 13 and 18' are opened and the contacts 18 and 19 are closed.

The projection 25 serves to hold the armature in either position as desired. When the battery cable is replaced current can then flow from the battery through contacts 18 and 19 and through winding 14 to the third brush 30 and through the unexcited armature to a field brush which is grounded to the frame, from the frame through the replaced battery cable and to the battery which completes a circuit.

The coil 14 becomes magnetized strong enough to actuate the rocker armature 17, thus closing contacts 13 and 18', resulting in the closing of the armature field circuit and this opens contacts 18 and 19, thus breaking the circuit through winding 14 from the battery. Thus the generator is restored to normal position after a mishap without electrical burn-out.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:—

1. A battery charging system comprising a generator, a pair of magnetic coils, a rockable arma-

ture operative by the coils, said armature being provided with a contact at each end thereof, a stationary contact adjacent each of the aforementioned contacts, a connection between one contact of the armature and the battery to be charged, a connection between one of the stationary contacts and one end of one of the coils, the opposite end of the last-mentioned coil being connected to the main brush of the generator, a connection between the field winding of the generator and the remaining stationary contact, and a connection from the other contact of the armature to the one end of the remaining coil and third brush of the generator, the last mentioned coil having one end grounded and its opposite end connected to the third brush of the generator.

2. A battery charging system comprising a generator, a pair of magnetic coils, a rockable armature, said armature being provided with a contact at each end thereof, and operative by the said coils, a stationary contact adjacent each of the aforementioned contacts, a connection between one of the contacts of the armature and the battery to be charged, a connection between one of the stationary contacts and one end of one of the coils, the opposite end of the last-mentioned coil being connected to the main brush of the generator, a connection between the field winding of the generator and the remaining stationary contacts, a connection between the other contact of the armature and the third brush of the generator, the remaining coil having one end grounded and its opposite end connected to the third brush, and rack and detent means whereby the armature bar can be retained in a tilted position in either direction for maintaining the field circuit open or closed.

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