

(No Model.)

L. T. STANLEY & A. E. BRADDELL.
AUTOMATIC ELECTRO MAGNETIC CUT-OUT.

No. 528,185.

Patented Oct. 30, 1894.

Fig. 2

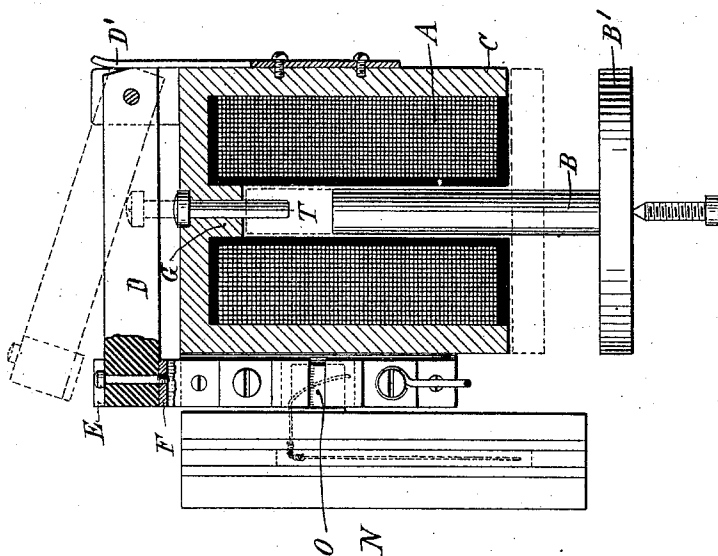


Fig. 1

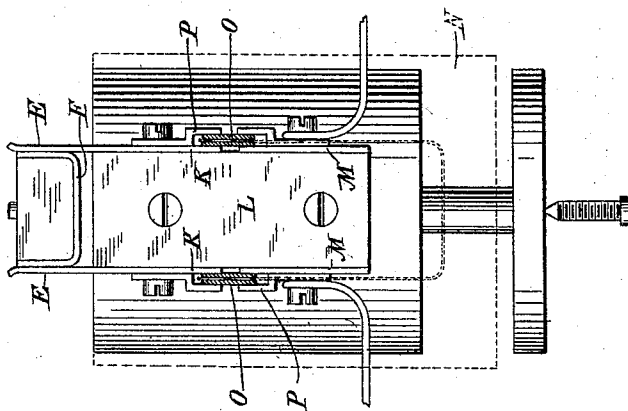
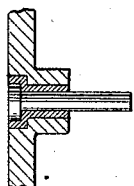


Fig. 3



Witnesses
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UNITED STATES PATENT OFFICE.

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AUTOMATIC ELECTROMAGNETIC CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 528,185, dated October 30, 1894.

Application filed August 22, 1893. Renewed June 1, 1894. Serial No. 513,209. (No model.)

To all whom it may concern:

Be it known that we, LUCIUS T. STANLEY, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, and ALFRED E. BRADDELL, a subject of the Queen of England, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Electromagnetic Cut-Outs, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

In an application filed by Lucius T. Stanley, July 18, 1893, Serial No. 480,845, there is shown and described an electro-magnetic cut-out or device for interrupting a circuit upon any abnormal increase in the current flowing therein. This device comprised a vertically movable magnetic plunger having a pole plate at its lower, and a non-magnetic extension at its upper end, and which was arranged to move through a coil surrounded by a magnetic jacket or casing. The non-magnetic extension of the core passed through a hole in the jacket and when the core was raised said extension encountered and shifted a cut-out lever or switch, and interrupted the circuit. In conjunction with this cut-out there is also shown a fuse holder or box having terminal plates adapted to mechanically engage with the plates of the switch and connect the box to the same, so that when the circuit was broken between the switch terminals it would be completed through the fuse for a sufficient time before the fuse was blown out, to prevent arcing at the switch.

The present invention consists in improvements on this device; the said improvements residing in a special construction of the switch terminal plates for use with the fuse box and in a novel construction of the means for operating the switch.

In the accompanying drawings, Figure 1 is a view in elevation of our improved cut-out with the fuse-box removed. Fig. 2 is a central vertical section of the same in a plane at right angles to that of Fig. 1, and Fig. 3 is a part sectional view of a detail of Fig. 3.

A is the coil, B the plunger or core provided with the pole plate B', and C is the iron jacket surrounding the coil and core.

D is the pivoted switch bar which is acted upon by a spring D' which holds it in either its raised or depressed position, and E E are terminal plates of the switch which when the lever is depressed, are bridged to complete the circuit by a bridge-piece F.

Immediately over the plunger or core B is a pin or push rod T of magnetic iron or steel which works freely through a hole in the top of the jacket C. This rod has a flanged head at its upper end which, fitting into a counter-sink in the top of the jacket C, permits the lower end of the rod to fall into proper position to be acted upon by the plunger.

When no current is passing through the coil the relative position of the parts is as shown in Fig. 2, the lower end of the push rod projecting below a boss G which extends into the coil, and reaching to within a short distance of the upper end of the plunger. By this arrangement, a greater sensitiveness and certainty of operation are acquired. The pole plate may be placed farther away from the bottom of the iron jacket than could otherwise be done, and the action is quicker and stronger whatever the distance of the pole plate, than if the push rod were omitted or supplanted by a non-magnetic extension to the core.

When current is passing through the coil, the push rod becomes, magnetically, a portion of the iron jacket C and normally it would be held in position as shown in solid lines in Fig. 2, but the moment sufficient current passes through the coil to lift the plunger, the latter rises with a constantly increasing force until it encounters the push rod, by which time it has acquired sufficient momentum to overcome the magnetic traction between the push-rod and the jacket and drive the rod up into the position indicated in dotted lines in Fig. 2. As the plunger can push it no farther, it stops in this position as long as current flows in the coil, being held in this position by the magnetic traction between it and the jacket and the attraction of the plunger.

If desired, the effect of the magnetic traction may be largely overcome by introducing a diamagnetic bushing H between the push rod and the jacket. This is shown in Fig. 3 and when such bushing is used it becomes of less importance to the sensitiveness and efficiency of the instrument that the push rod should be independent of the plunger.

The switch terminals proper are two plates KK secured to an insulating block L attached to the jacket C. Other plates or line terminals M M are also secured to the block L, but at a short distance from plates K.

The fuse box N is provided with terminals O, to which the fuse is connected and these terminals project from the box so as to be used as the means for mechanically attaching the fuse box to the cut-out. To do this the box terminals are forced down over the plates K, M so as to bridge or connect those plates on each side of the block L. By this means the main or switch circuit may be completed only when the fuse box is in position. Should the fuse box be taken off and the switch lever depressed, no injury would result.

Plates P P may be secured to or over the plates K so as to form slots into which the fuse box terminals may be forced.

Having now described our invention, what we claim is—

1. In an automatic cut-out, the combination of the jacketed coil, the movable core or plunger, the pivoted switch lever and co-operating contacts and the push rod of magnetic

metal between the switch lever and core, as set forth.

2. The combination of the coil, a magnetic jacket surrounding the same and provided with a boss that extends into the coil, a reciprocating plunger or core, a switch lever, and co-operating contacts and a magnetic push rod extending through a perforation in the boss and adapted to be encountered and forced against the switch lever by the movement of the core as set forth.

3. In an automatic cut-out the combination of the jacketed coil, the reciprocating core, the pivoted switch lever, co-operating contacts and the magnetic push rod extending through a dia-magnetic bushing in the end of the jacket under the switch lever as set forth.

4. In an automatic cut-out, the combination with an insulating block of four plates secured to the edges of the same and forming respectively, or connected with the terminal plates of the switch and the binding posts of the line, a fuse box having terminal plates to which a fuse is connected, the said plates being adapted to engage with and bridge the plates on the sides of the block and to mechanically secure the fuse-box thereto, as set forth.

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