

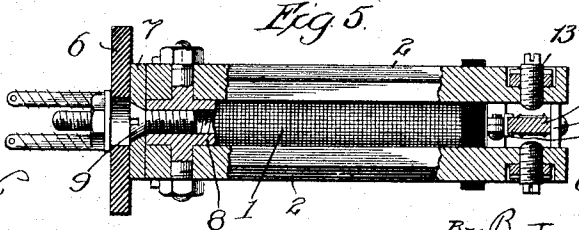
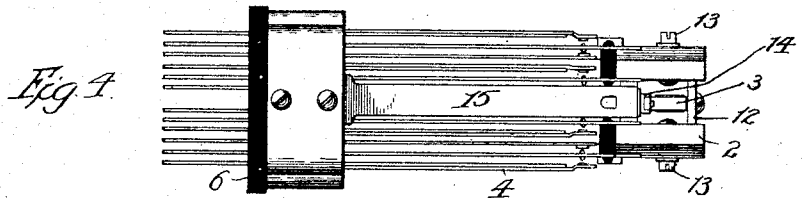
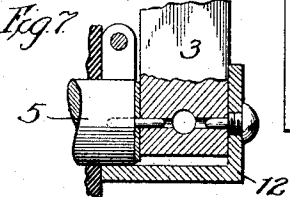
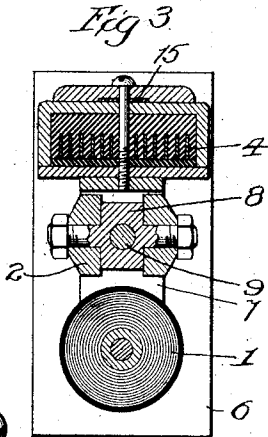
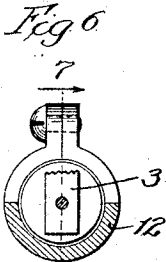
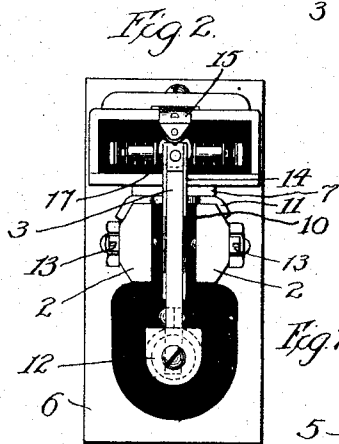
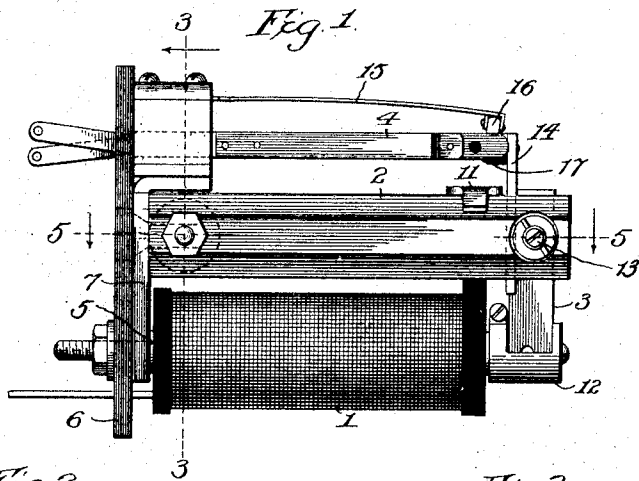
G. F. ATWOOD.

RELAY.

APPLICATION FILED JULY 13, 1907.

949,952.

Patented Feb. 22, 1910.



Witnesses:

W. C. Dawson,
Alfred H. Moore.

Inventor:

George F. Atwood.
By Barton, Tanner & Folk,
Attys.

UNITED STATES PATENT OFFICE.

GEORGE F. ATWOOD, OF NEW YORK, N. Y., ASSIGNOR TO WESTERN ELECTRIC COMPANY,
OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

RELAY.

949,952.

Specification of Letters Patent.

Patented Feb. 22, 1910.

Application filed July 13, 1907. Serial No. 383,548.

To all whom it may concern:

Be it known that I, GEORGE F. ATWOOD, citizen of the United States, residing at New York, in the county of New York and State of New York, have invented a certain new and useful Improvement in Relays, of which the following is a full, clear, concise, and exact description.

My invention relates to a polarized magnet device such as, for example, a relay for controlling contact springs, and its object is to provide a simple and compact structure which is cheap to manufacture.

My invention consists in a novel assembly and arrangement of the parts and in structural details, which may be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a polarized relay embodying my invention; Fig. 2 is a front end elevation of the same; Fig. 3 is a section on the line 3—3 of Fig. 1; Fig. 4 is a top plan view; Fig. 5 is a section on the line 5—5 of Fig. 1; Fig. 6 is a detail view, partly in section of the pole extension, showing the method of mounting the armature; and Fig. 7 is a section on the line 7—7 of Fig. 6.

Like parts are designated by similar figures of reference throughout the several views.

The magnet coil 1, the U-shaped permanent magnet 2, and the structure actuated by the armature 3, which in the device illustrated is a set of contact springs 4, are mounted in alinement with one another, and preferably in a vertical row, as shown in the drawings.

The magnet 1 surrounds a soft-iron core 5, said core being secured at the rear to a block or plate 6, and carrying between said block and the coil or spool a pole piece 7 which extends upwardly in contact with the block 6, and at its upper end is bent at right angles. The two arms of the permanent magnet 2 are connected by a yoke-piece 8, said yoke-piece being held upon the pole piece 7 by a screw 9. The forward end of the magnet 2 is mounted upon an insulated standard 10, which extends upward from the magnet core, and is held thereon by a fastening clip 11.

A set of contact springs 4 are held in assembled relation in the usual manner and are

mounted upon the angular extension of the pole piece 7.

Upon the front end of the pole piece 5 is clamped a core extension 12, said extension having a trough-like depression in its upper surface. The armature 3 is pivoted in said depression, with its two edges in juxtaposition to the opposite ends of the trough. With this construction the magnetic flux is led into both the front and rear edges of the armature, the resulting tendency being to magnetically float the armature and prevent its sticking to the core extension. The armature 3 extends upwardly between the opposite poles of the U-shaped magnet. An extension 14 of said armature is equipped at its upper end with an insulating block 17 adapted to actuate the contact springs on either side thereof according to the direction of the current which energizes the coil 1. A spring 15 mounted above the armature carries a roller 16 adapted to engage a groove in the block 17 and normally hold said armature in its neutral position between the pole faces of the permanent magnet.

Each pole of the permanent magnet may be provided with a set screw 13 in order that the distance between said poles and the armature may be made adjustable, and the extent of the lateral movement of said armature controlled.

When current is passed through the coil 1, the core 5 including the armature 3 mounted thereon is magnetized, the polarity of the armature depending upon the direction in which the current enters the coil. The U-shaped magnet presenting a positive pole on one side of said armature, and a negative pole on the other, said armature if given, for example, a positive polarity by the magnetizing of the coil, will be attracted by the negative pole and repelled by the positive. A reversal of current in the coil will reverse the polarity of the armature, which will thereupon be attracted by the positive pole and repelled by the negative. When the coil receives no current, the pressure of the spring 15 will cause the roller 16 to descend to the bottom of the groove in the block 17, thus returning the armature to its neutral position and opening the spring contacts.

It will be apparent that by means of my invention a device is produced which is very compact, and will operate with the greatest

efficiency, and which is cheap and simple to manufacture.

I claim:—

1. In a polarized relay, the combination
5 with a magnet coil, of a core having an extension projecting beyond the front end of said coil, an armature mounted upon said extension, an upwardly extending pole piece carried by the rear end of said core, and a U-
10 shaped permanent magnet mounted on said pole piece, said permanent magnet having its poles extending on opposite sides of said armature, and a set of contact springs also
15 mounted on opposite sides of said armature and arranged to be actuated by the movement thereof in either direction, said electromagnet, permanent magnet, and set of contact springs being mounted in line with one
20 another.

2. In a polarized relay, the combination with an electromagnet, of an armature therefor, a U-shaped permanent magnet having
25 its poles extending on opposite sides of said armature, a set of contact springs, an extension of said armature having a grooved insulating block arranged to actuate said springs in the movement of said armature,

and a spring mounted above said armature and provided with a roller arranged to engage the groove in said insulating block, and thereby to normally hold said armature in a neutral position between the poles of said permanent magnet.

3. In a polarized relay, the combination
35 with a magnet coil, of a core having an extension projecting beyond the end of said coil, an armature pivotally mounted upon said extension, a pole piece carried by the opposite end of said core, a U-shaped permanent magnet mounted upon said pole
40 piece and having its poles extending on opposite sides of said armature, and a set of contact springs mounted upon said pole piece, said contact springs extending into the path
45 of movement of said armature and adapted to be controlled thereby, said electromagnet, permanent magnet, and set of contact springs being mounted in line with one another.

In witness whereof, I hereunto subscribe
50 my name this third day of July A. D., 1907.

GEORGE F. ATWOOD.

Witnesses:

WM. D. FONDERLEICH,
A. T. SOUTAR.