June 1, 1926. 1,586,855

M. B. STAZAK

POLARIZED RELAY

Filed Jan. 26, 1921

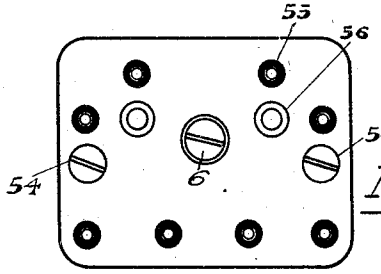


Fig. 2.

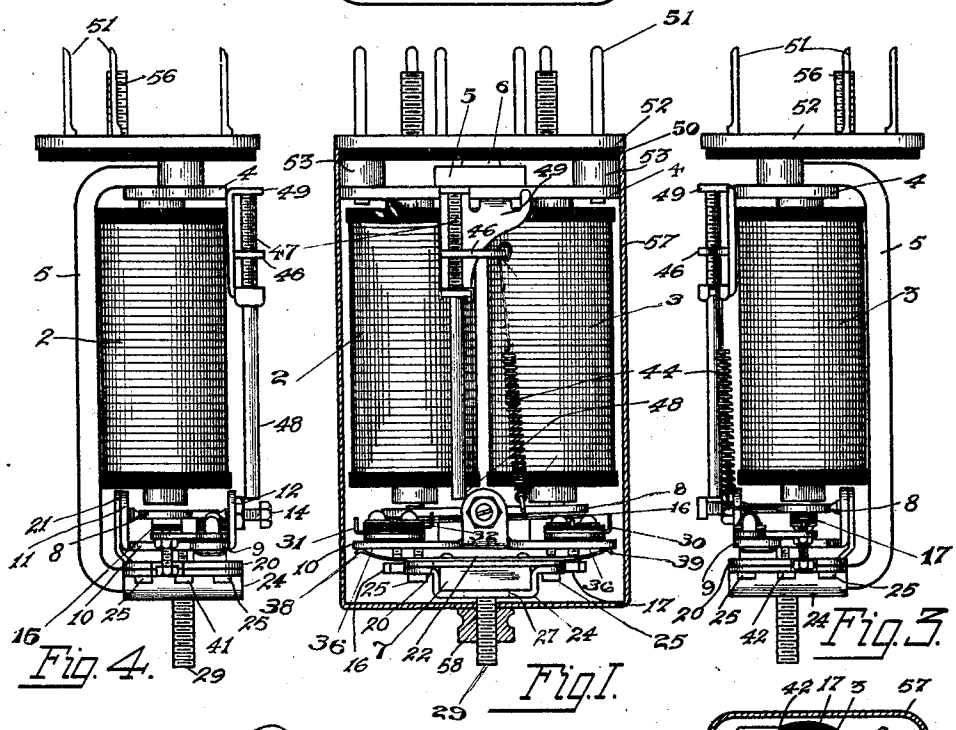


Fig. 4. Fig. 1. Fig. 3.

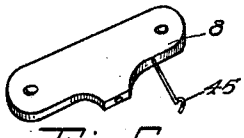


Fig. 6.

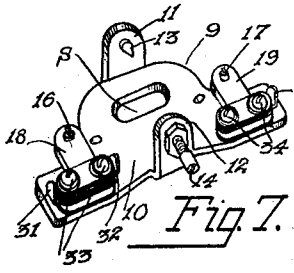


Fig. 7.

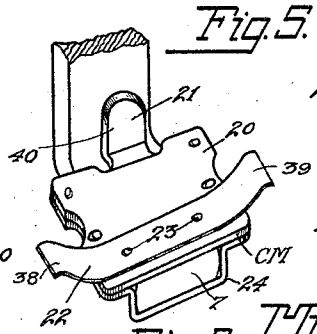


Fig. 8.

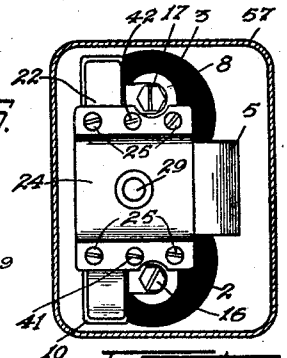


Fig. 5.

Inventor:
Michael B. Stazak
By Curtis B. Camp.
Attorney.

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UNITED STATES PATENT OFFICE.

MICHAEL B. STAZAK, OF CHICAGO, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

POLARIZED RELAY.

Application filed January 26, 1921. Serial No. 439,900.

My invention relates to relays and has to do more particularly with relays of the type which are known in the art as polarized relays. These are used for a number of purposes, both in telephony and telegraphy, and an object of my invention is to provide an improved device of the class described which will embody desirable features and advantages, all in a simple, efficient and economical manner.

In a relay of the above type, the means for adjusting the space or air-gap between the armature and the ends of the magnet cores is often mounted in such a way that it is inaccessible from the front of the relay and it is necessary to provide a special tool for use when an adjustment is necessary, besides which time is lost due to the difficulty in applying the special tool to said adjustable means.

To overcome these objectionable features, I provide an adjustable means which has adjustable screws for adjusting the air-gap, and I mount said adjustable means on one of the legs of the permanent magnet in such a way as to permit access to the said means from the front, and with the aid of an ordinary screw-driver or similar tool an accurate adjustment may be made in a very short time.

Another feature of my invention is this, that the said adjustable means may be removed from the relay by unscrewing the permanent magnet from the relay without removing the entire relay from its mounting plate.

The above features of my invention, as well as others, will be more fully hereinafter described, and for a more complete understanding of my invention, reference may be had to the accompanying drawings, in which I have illustrated a preferred embodiment of my invention, and in which like reference characters in the several views denote like parts, and in which—

Fig. 1 is a front elevation of the relay of my invention;

Fig. 2 is a top view of the relay;

Fig. 3 is a side view of the relay;

Fig. 4 is a view of its other side;

Fig. 5 is a bottom view of the relay;

Fig. 6 is a perspective view of the armature of the relay;

Fig. 7 is a perspective view of the combined armature and adjustable contact supporting member;

Fig. 8 is a perspective view of the clamping member which adjustably supports, as a whole, the armature supporting member and armature in operative association with the electromagnets of the relay.

Referring now in detail to my invention as illustrated, it comprises a pair of electromagnets 2 and 3 connected by a yoke 4 and secured thereto in any suitable manner. The U-shaped permanent magnet 5 is secured to the yoke 4 by means of a screw 6, and its free end or leg 7 extends over the armature and in proximity thereto, for the customary purposes. The said leg 7 also serves as a support for the clamping member CM, with which is adjustably associated the armature supporting member 9 to be hereafter described.

A clamping member CM, as shown in Fig. 8, comprises a plate 20 having an angularly projecting ear 21, integrally formed therewith. To said plate 20 is secured a spring 22 by means of the rivets 23, the purpose of this spring to be hereinafter described. A plate 24 shaped to fit tightly on the leg 7 of the permanent magnet 5 is secured to the plate 20 by means of machine screws 25 extending through suitable openings in the plate 24 and having screw-threaded engagement with suitable tapped orifices in the plate 20. This arrangement securely clamps the two plates 20 and 24 to the leg 7 of the permanent magnet 5. An opening 27 is provided in plate 24, permitting the protrusion of the stud 29.

The combined armature and adjustable contact supporting member 9 comprises an angularly shaped plate 10 having upwardly projecting ears 11 and 12, said ear 11 carrying the trunnion pin 13, and the ear 12 carrying an adjustable pivot screw 14, said trunnion pin 13 and adjustable pivot screw 14 pivotally supporting a suitable armature 8. Two brackets 18 and 19 provided with adjustable contact screws 16 and 17, and three terminals 30, 31 and 32 are secured to the mounting member 9 by screws 33 and 34, said bracket 18 making contact connection with terminal 31, and bracket 19 making contact connection with terminal 30.

Bracket 18 and terminal 31, and bracket 19 and terminal 30 are suitably insulated from the armature supporting member 9 and from screws 33 and 34. Terminal 32 is likewise insulated from terminal 31 and screws 33. An oblong slot S is provided in the mounting member 9 for permitting access to a screw which secures a contact spring to the armature 8.

The combined armature and adjustable contact supporting member 9 is disposed between the clamping member and the ends of the electromagnet cores, which brings it into operative engagement with the leaf spring 22 of the clamping member CM, the face 36 of the member 9 bearing against the faces 38 and 39 of the ends of the leaf spring 22, the projecting ear 11 resting on the face 40 of the angular ear 21 of the plate 20. The said armature mounting member 9 is adjustably and securely held in its relation with the leaf spring 22 by means of adjustable screws 41 and 42 extending through suitable openings in the clamping member CM, and having screw-threaded engagement with suitably tapped orifices in the armature mounting member 9. The leaf spring 22 serves to keep a continual pull on the adjustable screws 41 and 42, thus preventing them from turning without the aid of an outside agent.

To increase or decrease the space or air-gap between the armature 8 and the ends of the electromagnet cores, all that is necessary is to turn the screws 41 and 42 in clockwise or counter-clockwise direction, depending on the width of the air-gap desired. If one of the air-gaps is desired to be decreased, one will turn the corresponding screw in a counter-clockwise direction, and the movement of the said screw will move the armature supporting member 9 away from the clamping member CM and bring the armature 8 closer to the end of the magnet core, thus decreasing the air-gap. If the air-gap is to be increased, turn the said adjustable screw in a clockwise direction, which will move the armature supporting member 9 closer to the clamping member CM, thus moving the armature 8 away from the end of the magnet core and increasing the air-gap.

The movement of one of the said screws does not, however, produce any change in the air-gap controlled by the other, and should this air-gap be in need of adjustment the corresponding screw must be operated as before described, it being observed that when either adjusting screw is turned the armature supporting member 9 tilts on the other screw as a pivotal point.

The armature 8 of the polarized relay is held in a biased position by means of an adjustable tension spring 44, one end of which engages a hook 45 secured to the armature 8, and the other end of said spring is connected to an adjustable arm 46 having a tapped orifice for receiving the threaded portion 47 of the rod 48, said rod 48 being rotatably supported by a suitable bracket 49, which is in turn secured to the yoke 4 by screws. For a more detailed description and understanding of the means for adjusting the biased tension spring 44, reference may be had to pending application Serial No. 350,804, filed by Charles Sparks, January 12, 1920.

A terminal plate 50 of insulating material is provided which carries a plurality of terminals 51 suitably secured thereto, part of which serve for connecting external conductors to the energizing windings of the relay, while others serve for connecting external conductors with wires leading from the terminals 30, 31 and 32. The terminal 32 is also connected to the contact spring, secured to the armature 8 in the usual and well-known manner, and for the usual purposes. A clamping plate 52 holds the terminal plate 50 between the spacer washers 53 and itself by means of the screws 54 which pass through openings in the plate 52 and washers 53 and have screw-threaded engagement with tapped orifices in the yoke 4. The plate 52 has openings 55 through which the terminals 51 project. An enclosing cover or shell 57 is provided which is slipped over the relay and held in place by means of a nut 58. A stud 29 which is secured to the leg 7 of the U-shaped permanent magnet 5 extends through a suitable opening in the bottom of the cover 57 and has screw-threaded engagement with the nut 58, thereby securing the said cover 57 in place, enclosing the relay. Bolts 56 are secured to the clamping plate 52 and form means whereby the relay and its enclosing shell 57, as a whole, are mounted on a supporting strip in the usual manner.

I desire not to be limited to the precise structures shown and described, but shall claim my invention in a general manner, intending to so word it as to include modifications within the scope of the invention.

What I claim as new and desire to secure by United States Letters Patent, is:

1. An adjustable mechanism comprising a U-shaped magnet to which is secured a clamping member having a leaf spring secured thereto, a contact and armature supporting member adjustably associated with said clamping member by means of said leaf spring, and adjustable screws extending through said clamping member and engaging tapped orifices in said contact and armature supporting member, said contact and armature supporting member moving to or away from said clamping member when the said adjustable screws are rotated.

2. An adjustable mechanism comprising a

U-shaped magnet associated with a pair of electromagnet coils, a member having a leaf spring fastened to one leg of said U-shaped magnet, a carrier supporting an armature and adjustably associated with said member by means of said leaf spring and by adjustable screws and thereby interposed and floated between the ends of said electromagnet coils and said member, the space between each end of said armature and its associated coil being independently regulated and adjusted by rotating the said adjustable screws.

3. An electromagnet having an armature pivotally supported on a carrier, a permanent magnet, said carrier being also pivotally supported on the permanent magnet of said electromagnet, screw-threaded adjusting means for tilting said carrier and therefore said armature to and from said magnet, and terminals for said electromagnet secured to said carrier.

4. A two-coil electromagnet having an armature pivoted at a point intermediate of its cores upon a carrier pivotally supported independently of said cores at points one on either side of the pivotal armature support by screw-threaded adjusting means, and terminals for said electromagnet secured to said carrier.

5. An electromagnet including a pair of coils, an armature pivotally mounted intermediate of the coils and independently of said coils, a permanent magnet to polarize said armature and carrying it by clamping means including screw-threaded adjustable pivotal supports, one on either side of the armature mounting, said armature mounting adapted to be moved to adjust the relation of the armature to the cores of the electromagnets.

6. A two-coil polarized electromagnet having an armature pivoted between its cores, and micrometrically adjustable means for changing the air gap between said armature and either core independently of the air gap at the other core, said means comprising a carrier for said armature and screw-threaded devices for changing the position of either end of said carrier independently of its other end, and supporting means for supporting said carrier relative to said cores, said supporting means being clamped to the permanent magnet of said polarized electromagnet.

7. A polarized electromagnet having an armature, means for maintaining the armature in a biased condition, micrometer adjusting means for each end thereof, means for pivotally supporting said armature independently of the cores of said electromagnet, other means for supporting said second means relative to the cores of said electromagnet and for operatively associating said adjusting means with said armature supporting means.

Signed by me at Chicago, in the county of Cook and State of Illinois, this 24 day of January, 1921.

MICHAEL B. STAZAK.