May 13, 1924. 1,493,572

C. SPARKS

POLARIZED RELAY

Filed Jan. 12, 1920

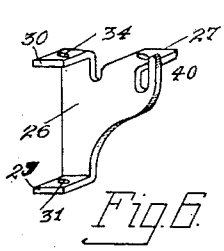

Fig. 6.

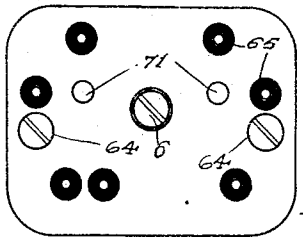

Fig. 2

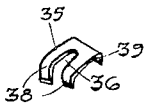

Fig. 7.

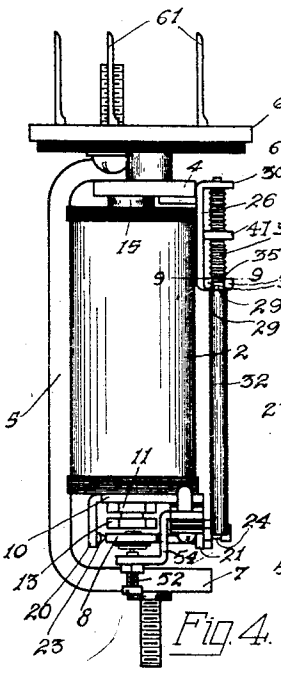

Fig. 4.

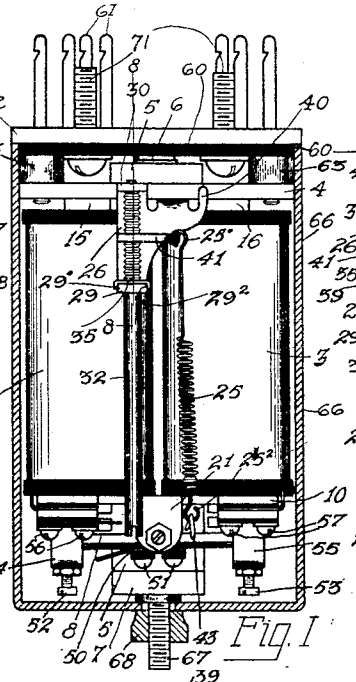

Fig. 1

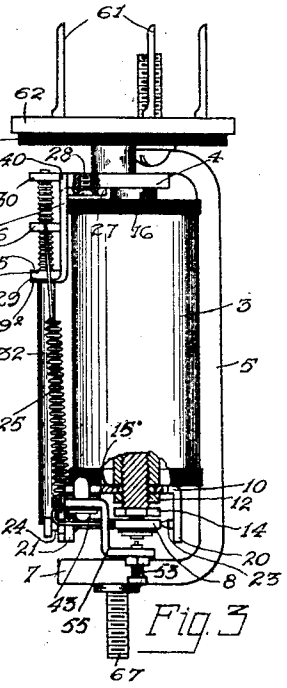

Fig. 3

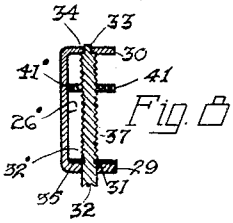

Fig. 8

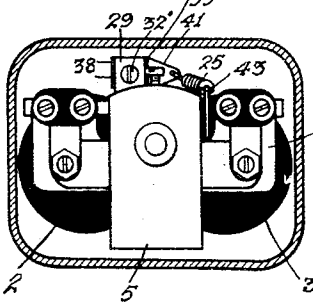

Fig. 5

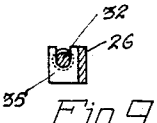

Fig. 9.

Inventor:
Charles Sparks
By Curtis B. Camp
Attorney

Patented May 13, 1924. 1,493,572

UNITED STATES PATENT OFFICE.

CHARLES SPARKS, OF OAK PARK, ILLINOIS, ASSIGNOR TO KELLOGG SWITCHBOARD AND SUPPLY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

POLARIZED RELAY.

Application filed January 12, 1920. Serial No. 350,304.

To all whom it may concern:

Be it known that I, CHARLES SPARKS, a citizen of the United States of America, residing in Oak Park, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Polarized Relays, of which the following is a specification.

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. Polarized relays are used for a variety of purposes, both in the telephone and telegraph art, and an object of my invention is to produce 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 armature is held in a biased position by means of a spring, in which one end of the spring is secured to the armature and the other end is secured to a strand of twine or other flexible material, which is in turn secured to a screw, which screw, when turned to the right or left, winds or unwinds the twine secured thereto to place the spring under proper tension. This adjusting means is objectionable, as the twine is apt to break by usage, and the screw is mounted in such a position that it is inaccessible from the front of the relay. To overcome these objectionable features, I provide an adjusting means in the form of a threaded rod, which supports a member which has screw-threaded engagement therewith, and the spring provided has its one end secured to the armature of the relay and its other end secured to the member supported on the rod so that when the said rod is turned to the right or left, as the case may be, the said member is raised or lowered to place proper tension upon the spring to bias the armature of the relay properly.

The above feature 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 drawing, 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 Fig. 1;

Fig. 3 is a right side view of Fig. 1;

Fig. 4 is a left side view of Fig. 1;

Fig. 5 is a bottom view of Fig. 1;

Fig. 6 is a perspective view of the bracket which supports the adjusting means of my invention;

Fig. 7 is a perspective view of the retaining clip;

Fig. 8 is a sectional view along the line 8—8 of Fig. 1; and

Fig. 9 is a sectional view along the line 9—9 of Fig. 4.

Referring now more in detail to my invention as illustrated, it comprises a pair of electro-magnets 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 the free end or leg 7 of the U-shaped permanent magnet 5 extends over the armature 8, in proximity thereto, for the customary purposes. A yoke 10 is provided, and for the purpose of securing it to the magnets 2 and 3, I provide lock nuts 11 and 12 and studs 13 and 14. The studs 13 and 14 are provided with threaded portions which pass through suitable openings 15′ in the yoke 10, the threaded portions of said studs 13 and 14 having screw-threaded engagement with suitable tapped orifices in the ends of the cores 15 and 16 of the electro-magnets 2 and 3. The lock nuts 11 and 12, which have screw-threaded engagement with the threaded portions of the studs 13 and 14, clamp the yoke 10 between the core ends and the nuts 11 and 12. The studs 13 and 14 are provided with hexagonal heads which may be grasped by a suitable tool and turned to the right or left, as the case may be, to obtain the proper adjustment between the armature 8 and the said studs 13 and 14, which serve as extensions for the said cores 15 and 16, to place the said cores in operative relation with the armature.

The yoke 10 is provided with downwardly projecting ears 20 and 21, the said ear 20

carrying the trunnion pin 23, and the ear 21 carrying the adjustable screw 24, which pin 23 and screw 24 pivotally support the armature 8. The armature 8 of the polarized relay of my invention is held in a biased position by means of an adjustable tension spring 25, and the means for adjusting spring 25 will now be described. A bracket member 26 is provided with an angular extension 27 extending parallel with the bottom face of the yoke 4, which angular extension 27 is provided with a suitable opening of a size to permit the passage of the screw 28, which has screw-threaded engagement with a suitable tapped orifice in the yoke 4, thus securing the bracket 26 to the yoke member 4. The bracket 26 is provided with angular extensions 29 and 30, integrally formed therewith, the said extension 29 being provided with an opening 31 of a size to permit the passage of the rod 32. The end of the rod 32 which extends through the opening 31 in the extension member 29 is provided with a reduced end portion 33, which reduced portion 33 enters an orifice 34 in the extension arm 30, said orifice 34 being of a size to receive this reduced portion 33.

To retain the rod 32 in its position as illustrated, I provide a clip 35 having a bifurcated portion 36, which bifurcated portion 36 rests in an annular groove 32′ on the rod 32 just above the threaded portion 37 of the rod 32, and the clip, when in this position, supports the rod 32 in the extension arms 29 and 30. The forked ends 38 of the bifurcated portions 36 are bent over, as is also the end 39 of the clip 35, the turned over portions 38 and 39 engaging the faces 29′ and 29^2 of the member 29, preventing the said clip from rotating when the rod 32 is turned to the right or left, for purposes as will be presently described, and the openings 34 and 31 in the extensions 30 and 29 of the bracket 26 form bearings for the rod 32 when it is rotated. A finger 40, integrally formed with the bracket 26, engages the face of the yoke 4, and the bracket 26 also engages the face of the yoke 4, thus positioning the bracket 26 on the yoke 4 when secured thereto by the screw 28. An adjustable member 41 provided with a suitable tapped orifice and having screw-threaded engagement with the threaded portion 37 of the rod 32 is supported upon the said rod 32. The tension spring 25 has its one end 25′, which is hooked, pass through a suitable opening in the member 41 to secure it thereto, and its other end 25^2 is secured to an eyelet 43, which eyelet 43 is secured to the armature 8 in any suitable manner.

The rod 32 is provided with a slotted end 32′, which slotted end is adapted to receive a screwdriver to permit turning the same, and when the rod is rotated to the right, the member 41, which is supported upon the threaded portion 37 of the rod 32, is moved in one direction to lessen the tension of the spring 25, and when the rod 32 is rotated to the left, the member 41 is moved in another direction to place greater tension upon the spring 25. By the rotation of said rod 32 to the right or left, the proper tension may be placed upon the spring 25 to place the proper biasing tension upon the armature 8. The face 41′ of the member 41 engages the face 26 of the bracket 26′, preventing rotation of the said member 41 when the rod is rotated, thus permitting only a longitudinal movement of the member 41.

A contact spring member 50 is secured to the armature 8 by means of screws 51, and is suitably insulated from the armature 8 and screws 51. Cooperating with the contact spring 50 is a pair of adjustable contact screws 52 and 53 supported by the brackets 54, 55, which are secured to the yoke 10 by means of the screws 56 and 57, said brackets 54 and 55 being suitably insulated from the yoke 10 and screws 56 and 57. The contacts 52 and 53 cooperate with spring contact member 50, as is well understood, and a detailed description is not deemed necessary. A terminal plate 60 of suitable insulating material is provided which carries a plurality of terminals 61 suitably secured to the plate 60. The terminals 61 serve as terminals for the external connections to the relay and also serve as terminals for the conductors which extend to the contacts 50, 52 and 53 and to the energizing windings of the electromagnets 2 and 3. A clamping plate 62 holds the terminal plate 60 between the spacer washers 63 and itself by means of the screws 64, which pass through suitable openings in the plate 62 and washers 63, said screws 64 having screw-threaded engagement with suitable tapped orifices in the yoke 10. The plate 62 is provided with suitable openings 65 through which the terminals 61 project. An enclosing cover or shell 66 is provided which is slipped over the relay and held in place by means of a nut 68. A stud 67 is secured to the leg 7 of the U-shaped permanent magnet 5. The stud 67 extends through a suitable opening in the bottom of the shell 66, and the nut 68, which has screw-threaded engagement therewith, secures the said shell in place, enclosing the relay. Bolts 71 are secured to the clamping plate 62 and form means by which the relay and shell as a whole are mounted on a suitable supporting strip.

While I have illustrated a preferred embodiment of my invention, it is obvious that changes and modifications will readily suggest themselves, and I, therefore, do not wish to be limited to the exact structure as

shown but aim to cover all such changes and modifications as come within the spirit and scope of the appended claims.

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

1. A relay structure of the class described, including a pair of electromagnets provided with cores extending parallel to each other, and a yoke member for supporting the same, an adjustable device including an angular bracket secured to said yoke member, said bracket provided with integrally formed projections for engaging said yoke member to prevent said device from rotating out of its secured position, an armature mounted in position to be operated by the said electromagnet cores, spring means connected to said armature and said adjustable device, and a device extending parallel to the cores of said electromagnet for moving said adjusting device for regulating the tension of said spring means.

2. A relay structure of the class described, including a pair of electromagnets and a yoke member for supporting the same, an armature pivotally supported in operative relation with the cores of said electromagnets, a member secured to said yoke member and having integrally formed projections for engaging said yoke member to prevent the rotation of said second member, an adjustable member associated with said second member, a spring connected at its one end to said armature and at its other end to said adjustable member, and a screw-threaded member supported by said second member and extending parallel to the said cores of said electromagnets for moving said adjustable member to secure the proper tension of said spring.

3. A relay structure of the class described comprising a pair of electromagnets provided with cores parallel to each other and secured to a yoke member, an armature pivotally supported in operative relation with the free extremity of the cores of said electromagnets, and an angular member secured to said yoke, integrally formed lugs for said angular member for cooperating with said yoke member to prevent said angular member from rotating out of its secured position upon said yoke member, a coiled spring having its one end attached to said armature and its other end attached to an adjustable member, said adjustable member being associated with said angular member and movable in a plane parallel to the planes of the cores of said electromagnets, and means accessible from the front of said relay structure for adjusting said adjustable member.

4. A relay structure of the class described comprising a pair of electromagnets provided with cores parallel to each other and secured to a yoke member, an angular member secured to said yoke member, and having integrally formed ears for engaging said yoke member to retain said member in its secured position against rotation, an armature pivotally supported in operative relation with the free extremity of the cores of said electromagnets, a coiled spring having its one end attached to said armature and its other end attached to an adjustable member, said adjustable member being operatively associated with said angular member and movable in a plane parallel to the planes of the cores of said electromagnets, means accessible from the front of said relay structure for adjusting said adjustable member, and contact members operable by said armature.

5. A device of the character described including a pair of electromagnets and a yoke to which the cores of said electromagnets are connected, an armature pivotally supported in operative relation with the cores of said electromagnets, a bracket secured to said yoke member, said bracket having angular projections for engaging said yoke to prevent the rotation of said bracket, adjusting means secured to said bracket and extending forward in position to be operated from the front of the relay structure, and a spring connecting said adjusting means to said armature.

6. A device of the character described including a relay structure having a forwardly extending magnet core, an armature supported in operative relation to the core of said electromagnet, a bracket secured to the rear structure of said relay and having integrally formed lugs for engaging said rear structure for maintaining said bracket in its secured position against rotation, adjustable means operatively associated with said bracket, a spring connecting said adjustable means to said armature, said adjustable means being accessible from the front of said electromagnetic structure and for adjusting the spring tension on said armature.

7. A relay structure of the class described comprising a pair of electromagnets and a yoke for supporting the same, an armature pivotally supported in operative relation to the cores of said electromagnets, a bracket secured to said yoke and having its ends provided with orifices and turned back at right angles to its main body portion, a rod engaging said orifices and supported by said bracket, a clip for engaging said rod for retaining it in its adjusted position on said bracket, a spiral spring having one end secured to said armature, and an adjustable means supported upon said rod between the turned back ends of said bracket to which the other end of said spring is secured to bias the said armature.

8. A relay structure of the class described comprising a pair of electromagnets and a yoke for supporting the same, an armature pivotally supported in operative relation with the cores of said electromagnets, a bracket secured to said yoke and having its ends provided with orifices and turned back at right angles to its main body portion, a screw-threaded rod rotatably supported in the orifices in said turned back ends of said bracket and extending parallel to the cores of the magnets, a clip for engaging said rod for retaining said rod in its adjusted position on said bracket, an adjustable member supported upon said screw-threaded rod, and a spring having one end secured to said member and its other end to the said armature for biasing the said armature.

9. A relay structure of the class described comprising a pair of electromagnets and a yoke for supporting the same, an armature pivotally supported in operative relation with the cores of said electromagnets, a bracket secured to said yoke, a screw-threaded rod rotatably supported on said bracket, an adjustable member supported by said rod, a coil spring having its one end secured to said member and its other end secured to said armature for biasing the said armature, and a clip engaging said rod to retain it in its adjusted position on said bracket.

10. A relay structure of the class described comprising an electromagnet and a yoke for supporting the same, a pivotally supported armature for said relay actuable by said electromagnet, a bracket secured to said yoke, a screw-threaded rod rotatably supported on said bracket, a clip engaging said rod to retain the same in position, an adjustable member supported by said rod, and a coil spring having its one end secured to said member and its other end secured to said armature to hold said armature in a biased position.

11. A relay structure of the class described comprising an electromagnet and a yoke for supporting the same, an armature pivotally supported in operative relation with the electromagnet's core, a bracket secured to said yoke supporting a rotatably screw-threaded rod extending forward and accessible from the front of the relay, a clip engaging an annular groove on said rod and secured to said bracket for preventing the disassociating of said bracket and said rod, an adjustable member supported on said rod, a spring having one end secured to said adjustable member and its other end secured to said armature for biasing the same, and means for rotating said rod to move said adjustable member longitudinally in relation to the rotary movement of said rod to secure the proper tension of said spring.

Signed by me at Chicago, county of Cook and State of Illinois, this 9th day of January, 1920.

CHARLES SPARKS.