July 13, 1926. 1,592,223

P. B. PARKS ET AL

RELAY

Filed March 8, 1923

Fig. 1.

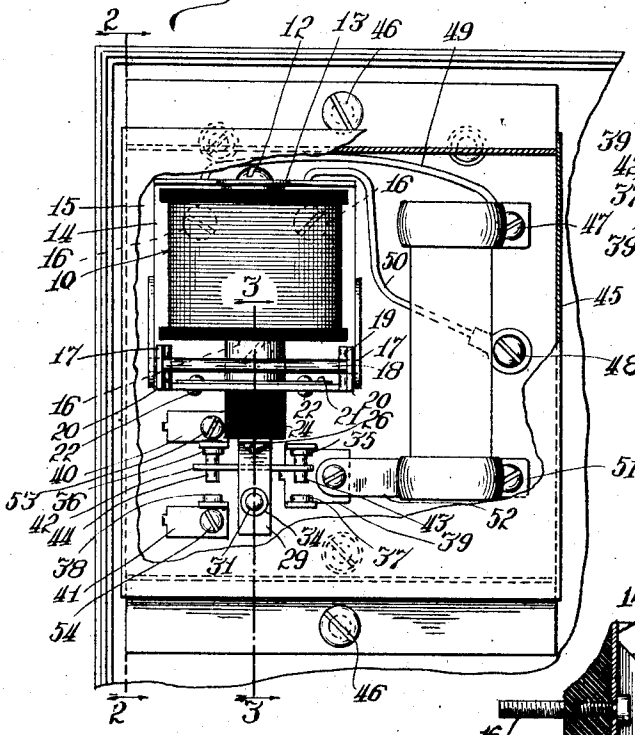


Fig. 4.

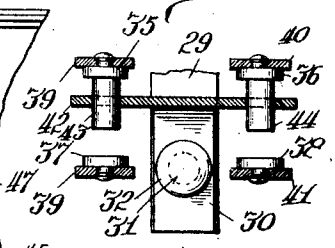


Fig. 3.

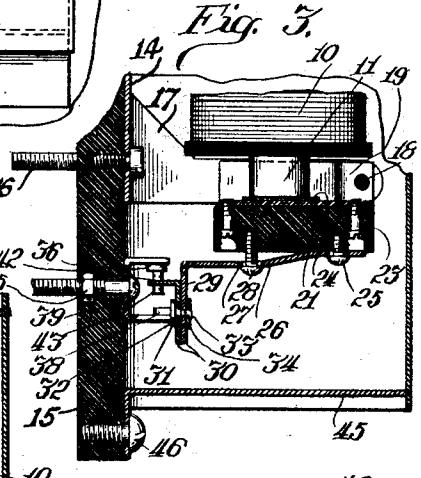


Fig. 2.

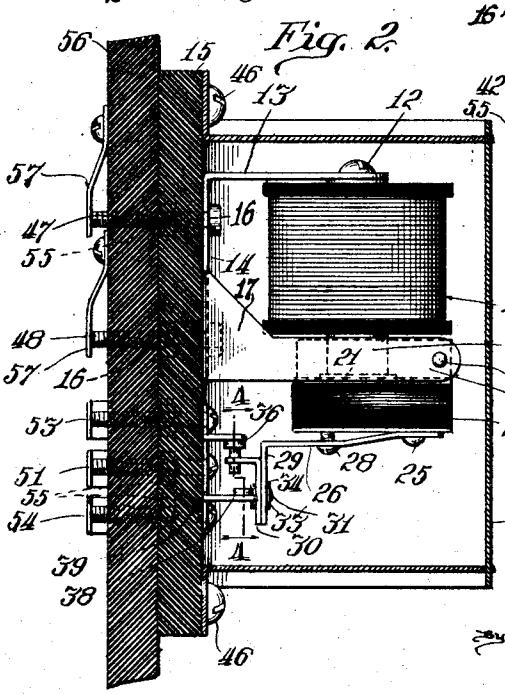
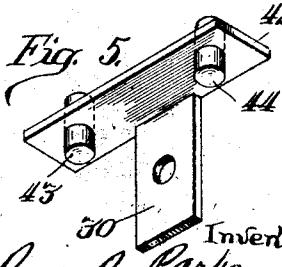


Fig. 5.



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UNITED STATES PATENT OFFICE.

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RELAY.

Application filed March 8, 1923. Serial No. 623,609.

Our invention relates to a relay, and one of the principal objects is to construct and arrange the armature so that the contact member or bridging member carried thereby will have a wiping movement over the fixed contacts of the relay tending to keep all of said contacts clean. A further object is to provide in a relay having two pairs of fixed contacts a pivoted contact or bridging member on the relay armature which will be self adjusting so as to insure proper seating upon the contacts on both sides of the gaps which it bridges.

The invention has for a further object such other new and improved constructions, arrangements and devices relating to relays as will be hereinafter described and claimed.

The invention is illustrated in a preferred embodiment, in the accompanying drawing in which—

Fig. 1 is a front elevation of the relay shown as enclosed in a suitable housing, the front portion of which is broken away;

Fig. 2 is a sectional view on line 2—2 of Fig. 1;

Fig. 3 is a sectional view on line 3—3 of Fig. 1;

Fig. 4 is a sectional view on line 4—4 of Fig. 2;

Fig. 5 is a view, in perspective, of the contact or bridging member carried by the relay armature.

Referring to the drawing, 10 designates the coil of the relay magnet and 11 the core thereof which, as shown, projects beyond the bottom of the coil. The magnet is secured by a screw 12 to an outstanding plate 13 of a bracket structure, the back plate of which is indicated at 14 and is secured to a block or base plate 15 by screws 16. The bracket is formed with a pair of forwardly projecting arms 17 to the outer ends of which is fixed a rod 18, the arms 17 extending on opposite sides of the projecting end of the magnet core 11. The armature of the magnet consists preferably of a channel-shaped piece of soft iron 19 pivoted on the rod 18 between the bracket arms 17 with the interposition of washers 20. To prevent adhesion to the core 11 the armature 19 is furnished with a bronze plate 21 secured thereto by rivets 22. Secured to the under side of the armature 19 by screws 23 is a block 24 of insulating material to which is fastened by a screw 25 a leaf spring 26 slotted at 27 for the guide screw 28. The outer end of the leaf spring is bent over at right angles to the body of the spring, as indicated at 29, and has pivoted thereto the bridging plate 30. 31 is a pivot stud for connecting these parts having a head 32 and being riveted over at 33 on a washer 34, the connection being such that the bridging member may turn freely on the stud. The relay is provided with an upper pair of contacts 35, 36 and a lower pair of contacts 37, 38 preferably set slightly forward of the upper contacts. The contacts 35, 37 are secured to a plate 39. The contacts 36 and 38 are arranged on separate plates 40, 41. The bridging member 30 is formed with a forwardly projecting web 42 carrying contact studs 43, 44. 45 is a housing for enclosing the relay which is secured to the base plate 15 by screws 46.

47, 48 are binding posts for wires 49, 50 connected to the ends of coil 10. 51 is a binding post connected by bar 52 with the plate 39 carrying contacts 35, 37, and 53, 54 are binding posts connected respectively with plates 40 and 41 carrying the contacts 36, 38. These five binding posts extend through the base plate 15 and are secured thereto, in each case, by a nut 55. The plate 15 is secured to the front face of a base 56, the latter being perforated for the projecting ends of the binding post or terminal studs 47, 48, 51, 53, 54. On the back of the base are arranged spring contacts 57 against which the ends of the terminal studs bear, this arrangement providing a simple means for demountably supporting the plate 15 on the base 56 which provides for the electrical connections to the relay.

The pivotal mounting of the armature with respect to the magnet at points above, or it might be below, the fixed contacts and the yielding support of the contact member 30, 42 on the armature due to the elasticity of spring 26 produces a wiping or sliding movement of the contact studs 43, 44 against the fixed contacts 35, 36, or 37, 38, as the case may be, which tends to keep all of these contacts clean. That is the lever on which the movable contact studs are mounted is in effect elbow shaped with the limb extending toward the fixed contacts consisting of a spring, so that the studs after coming

against the fixed contacts will be dragged or pushed across the surface of said contacts by the continued turning of the lever on its fulcrum, pin 18. That is, the main portion of the spring stands approximately transversely to the direction of movement of the movable contact and is carried by an armature which is pivoted at a point a substantial distance on one side of the spring which gives the wiping or drawing effect referred to. The pivotal mounting of the contact or bridging member 30, 42 on the spring insures proper seating of the bridging member at both ends against the fixed contacts at opposite sides of the gaps which said member bridges thereby insuring the effectiveness of the wiping action where two pairs of contacts are involved. The distance between the armature in its lower position and the core 11 of the magnet is relatively small in comparison with the travel of the outer end of spring 26 so that a considerable gap can be provided between the upper and lower pair of fixed contacts while at the same time flexing of the spring at each end of its oscillatory movement is insured. An effective wiping movement of the movable contacts on the fixed contacts is thus provided for and intimate bearing of the co-engaging contacts made certain. The rocking movement of the bridging member makes it self-seating against both of the fixed contacts in the upper and lower position of the armature. These results are obtained by the construction and arrangement of parts which may be manufactured and assembled at small expense and without the necessity of minute adjustments. The channeled configuration of the armature and the arrangement of the same so that it straddles the projecting end of the magnet core allows a considerable amplitude of movement on the part of the armature without necessitating the expenditure of an excessive amount of magnetic force.

While we have described our invention in a preferred embodiment, it will be understood that we contemplate any and all structural modifications within the scope of the annexed claims.

We claim:

1. In a relay, the combination of an electromagnet, two spaced fixed contacts, a movable contact adapted to oscillate between the fixed contacts, a spring carrying the movable contact and extending approximately transversely to the direction of movement of the movable contact, and an armature for the magnet to which said spring is secured and which is pivoted at a point a substantial distance at one side of the spring so that the rocking movement thereof produces wiping movements of the movable contact on the fixed contacts.

2. In a relay, the combination of an electromagnet, two spaced pairs of fixed contacts, a bridging member adapted to oscillate between the pairs of fixed contacts, a spring approximately transverse to the direction of movement of the bridging member to which the bridging member is pivoted, and an armature for the magnet to which the spring is secured and which is pivoted at a point at a substantial distance on one side of the spring, so that the rocking movements of the armature produce wiping movements of the bridging member on the fixed contacts.

3. In a relay, the combination of an electromagnet, two spaced pairs of fixed contacts, a bridging member adapted to oscillate between the pairs of fixed contacts, a spring approximately transverse to the movement of the bridging member, the end of which is bent at substantially right angles to the body thereof, means for pivoting the bridging member at a point intermediate its ends to the angularly disposed end of the spring, and an armature for the magnet to which said spring is secured and which is pivoted at a point a substantial distance on one side of the spring so that the rocking movements of the armature produce wiping movements of the bridging member over the fixed contacts.

4. In a relay, the combination of an electromagnet, an armature, two pairs of fixed spaced contacts, and a bridging member pivotally and yieldingly sustained on said armature transversely thereof in position to be brought into contact alternately with one or the other pair of fixed contacts.

5. In a relay, the combination of a vertically arranged electro-magnet, upper and lower pairs of fixed spaced contacts arranged at one side of and below the magnet, the lower pair of contacts being offset toward the magnet with respect to the upper contacts, a horizontally arranged armature pivoted so as to oscillate under the magnet, an insulating block carried by said armature, a spring secured to the under side of said block and formed with a downturned end, a bridging member pivoted at a point intermediate its ends to the downturned end of the spring adapted to engage, with wiping action, with said fixed contacts.

6. In a relay, the combination of an electromagnet, an armature pivoted with respect to the magnet, two pairs of fixed spaced contacts, and a bridging member pivotally and yieldingly sustained on said armature transversely thereof in position to be brought into contact alternately with one or the other pair of said fixed contacts.

7. In a relay, the combination of an electromagnet, an armature pivoted with respect to the magnet, a spring on the armature, two pairs of fixed spaced contacts, and a bridging member pivoted to said spring

transversely thereof in position to be brought into contact alternately with one or the other pair of said fixed contacts.

8. In a relay, the combination of an electromagnet comprising a coil and a core, the end of which projects from the coil, a bracket having arms extending on opposite sides of the end of the core, a channel-shaped armature pivoted to said bracket arms, fixed spaced contacts and a contact member supported on said armature to oscillate between said fixed contacts.

9. In a relay, the combination of an electromagnet comprising a coil and a core, the end of which projects from the coil, a bracket having arms extending on opposite sides of the end of the core, a channel-shaped armature pivoted to said bracket arms, an insulating block on the under side of said armature, a spring on said block, fixed spaced contacts, and a contact member on said spring to oscillate between said fixed contacts.

10. In a relay, the combination of an electromagnet comprising a coil and a core, the end of which projects from the coil, a bracket having arms extending on opposite sides of the end of the core, a channel-shaped armature pivoted to said bracket arms, an insulating block on the under side of said armature, a spring on said block, fixed spaced contacts, and a contact member pivoted to the spring to oscillate between said fixed contacts.

11. In a relay, the combination of an electromagnet comprising a coil and a core, the end of which projects from the coil, a bracket having arms extending on opposite sides of the end of the core, a channel-shaped armature pivoted to said bracket arms, an insulating block on the under side of said armature, a leaf spring on said block having an angularly disposed outer end, fixed spaced contacts, and a contact plate pivoted to the end of the spring having an outstanding web to oscillate between said fixed contacts.

12. In a relay, the combination of an electromagnet comprising a coil and a core, the end of which projects from the coil, a bracket having arms extending on opposite sides of the end of the car, a channel-shaped armature pivoted to said bracket arms, an insulating block on the under side of said armature, a leaf spring on said block having an angularly disposed outer end, two pairs of fixed spaced contacts, and a bridging plate pivoted to the end of said spring and provided with a pair of contact studs to bear against said fixed contacts.

13. In a relay, the combination of an electromagnet, an armature, two pairs of fixed spaced contacts, a spring on said armature having an angularly disposed end, and a bridging plate arranged transversely to the spring and pivoted to the end of the spring formed with a web which projects between said pairs of contacts.

14. In a relay, the combination of an electromagnet, an armature, two pairs of fixed spaced contacts, a spring on said armature having an angularly disposed end, and a bridging plate arranged transversely to the spring and pivoted to the end of the spring formed with a web which projects between said pairs of contacts and is provided with contact studs to bear against said fixed contacts.

15. In a relay, an electromagnet comprising a coil and a core, the end of which projects beyond the coil, and a channel-shaped armature the flanges of which extend on opposite sides of the projecting end of the core.

16. In a relay, an electro-magnet comprising a coil and a core, the end of which projects beyond the coil, and a channel-shaped armature pivotally mounted with respect to the magnet, the flanges of which extend on opposite sides of the projecting end of the core.

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