Feb. 13, 1940. J. F. MERKEL 2,190,381

ARMATURE HINGE FOR RELAYS

Original Filed April 28, 1932

FIG. 1.

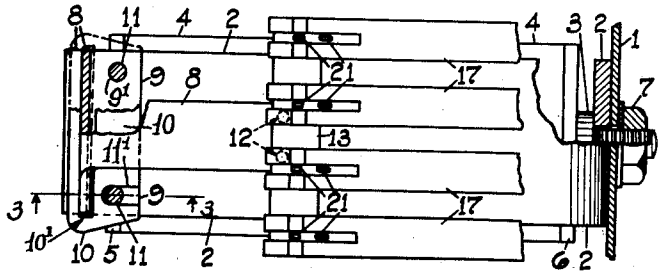


FIG. 2.

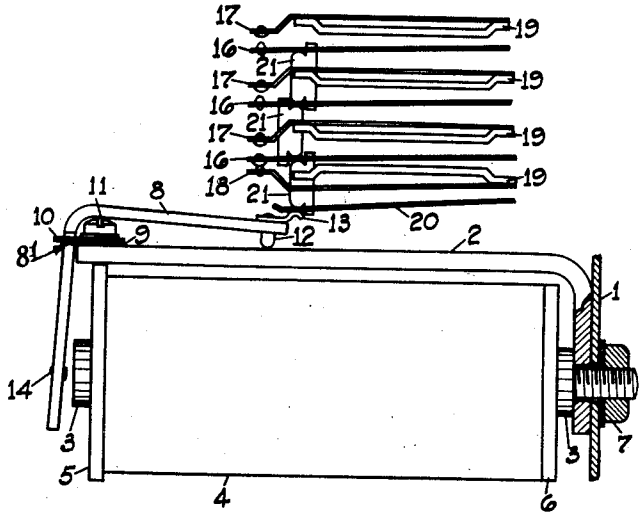
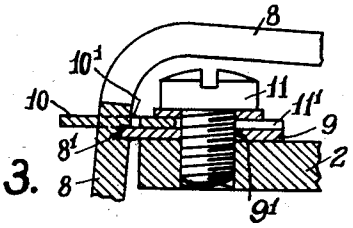


FIG. 3.



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ARMATURE HINGE FOR RELAYS

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Original application April 28, 1932, Serial No. 608,037. Divided and this application December 30, 1936, Serial No. 118,334

3 Claims. (Cl. 175—345)

This invention relates to relays, and more particularly to the hinge mounting means employed in connection with the relay armature.

The present application is a division of my application, Ser. No. 608,037, filed April 28, 1932, for "Relays" now Patent No. 2,069,171, granted January 26, 1937.

One object of this invention is to provide a mounting means for a relay armature, such as to be rugged and durable and long lived, and at the same time, to avoid any binding and undue friction when operating.

Other objects, purposes and characteristic features of the invention will appear as the description thereof progresses during which references will be made to the accompanying drawing which shows the invention in a manner to make it easily understood, rather than with the view of showing the particular construction preferably employed in practice, and in which:

Fig. 1 is a plan view of a relay constructed in accordance with the present invention with parts thereof sectioned and other parts broken away to more clearly show the construction;

Fig. 2 is a side elevational view of Fig. 1 also with parts sectioned;

Fig. 3 is a sectional view on line 3—3 of Fig. 1, viewed in the direction of the arrows.

Referring to the accompanying drawing, the relay proper is assembled in a rigid back plate 1 formed of sheet metal with the outside edges pressed at right angles thereto to add to its rigidity. Upon this plate 1 is assembled an electromagnetic operating means comprising a magnetic top yoke 2 spot welded thereto and a magnetic core 3 carrying a coil 4 wound thereon between insulating end washers 5 and 6 which may be pressed onto knurled ends of the core 3. One end of the core 3 is of smaller diameter and passes through a hole in the top yoke 2 and the back plate 1 and is held in place by a nut 7 threaded thereon to clamp the shoulder, formed by the larger body of the core 3, against the top yoke 2.

It may be mentioned here that the top yoke 2 is shaped to form a slightly acute angle between the outwardly extending portion and the portion welded to the back plate 1. This extending portion is then straightened out to approximately a right angle when the coil and core are assembled thereon by the pressure exerted at its end by the end washer 5 due to the tightening of the nut 7 thus leaving a slight stress between the end washer 5 and the end of the top yoke 2 to assure a fixed relation therebetween.

An armature 8, formed by bending a plane piece of material, is arranged to operate between the extending end of the top yoke 2 and the free end of the magnetic core 3. This armature 8 is retained in place by means clearly shown in Fig. 1 and Fig. 2, which means comprises a pivot strip 9, formed of a flat, rectangular piece of material, resting in a transverse open ended slot 8' in the armature 8, about which the armature is allowed to operate, and a retaining strip 10, which is formed from a flat piece of material, and is slotted, as at 10', to encircle the armature 8 to retain the transversely slotted armature on the strip 9. These strips 9 and 10 are held in place by two screws 11 threaded into the top yoke 2 and passing through holes 9' in the pivot strip 9, and open slots 11' in the retaining strip 10. This arrangement permits the lower end of the armature 8 to be passed through the retaining strip 10 and positioned with its slot on the pivot strip 9 after which the strip 10 is moved inwardly and clamped by the screws 11 to permit a free pivoting motion of the armature and yet retain the transversely slotted armature on the strip 9.

The deenergized position of the armature 8 is limited by the enlarged head of a rivet 12 which holds a transverse strip 13 shaped as shown in Fig. 2 and the attracted or energized position of the armature 8 is limited by a residual pin 14 which is arranged to engage the extending end of the core 3. Spring contact fingers of the conventional type are molded in hard insulating members (not shown) of material, such as Bakelite or the like, to form individual vertical groups, four of which groups are shown in the embodiment illustrated herein.

These spring contact fingers consist of movable fingers 16 and front and back fingers 17 and 18, which front and back fingers 17 and 18 have bifurcated ends with a low resistance, arc resisting contact point on each of these bifurcations arranged to engage with similar low resistance contact points on the movable contact fingers 16. The biased position, or the unengaged position, of the front and back contact fingers 17 and 18 is limited by rigid stops 19 which are also molded into the member supporting the individual vertical groups.

Beneath the lower contact finger of each group is a finger operating arm, or idler, 20 which is also molded in the said member, and extends beneath the fingers with its end resting on the transverse strip 13 attached to the armature 8. This finger operating arm 20 is connected with

the lower movable contact finger 16 by an insulating pusher 21 which passes through the slot forming the bifurcation of the back contact finger 18 and through a similar slot aligning therewith in the rigid stop 19.

The above rather specific description of one form of the present invention is given solely by the way of example, and is not intended in any manner whatsoever, in a limiting sense. It is also to be understood that various modifications, adaptations and alterations may be applied to meet the requirements of practice, without in any manner departing from the spirit or scope of the present invention, except as limited by the appended claims.

Having thus described my invention, what I claim is:

1. In a relay of the telephone type, a flux member having a substantially square cut, free end, an elongated armature bent on itself to form substantially a right angle and having a relatively wide inner face adjacent the said free end and formed of relatively thin material, a groove recessed in, and positioned transversely of, said face and extending from edge to edge, a relatively wide thin plane pivot plate carried by the flux member and having one of its wide edges received loosely in the groove and projecting beyond said free end to thus space the armature from the flux member, flat plane holding means passing around the outer face of the armature adjacent the groove, and means for fixing the holding means relatively to said pivot plate, whereby to hold the pivot plate in the armature groove.

2. In a relay, a magnetic member, a magnetic core secured at one end to one end of said magnetic member, a coil on said core, an armature operable to complete a magnetic circuit between the free end of said magnetic member and the free end of said core, the free end of the magnetic member being generally rectangular in cross section, said armature being formed of relatively thin flat material bent on itself to form substantially a right angle and having a relatively wide plane face facing, and parallel with, the free end of the magnetic member, a straight transverse open ended groove in said plane face of said armature and extending from one edge to the other of the armature, a flat plate pivot strip secured to said magnetic member and having one of its edges extending beyond the free end of the magnetic member and extending into said transverse armature groove to space the armature from the magnetic member, and a flat plate retaining member secured to said magnetic member and having a portion passing around the armature at a level adjacent the groove to retain said armature groove on said pivot strip.

3. In a relay, a magnetic flux member of substantially uniform rectangular cross section throughout and having a flat, relatively wide, square end, a grooved-out armature having a relatively wide, flat face mounted on the end of the member, the groove in said armature being transverse of the face and open ended, a flat plate pivot strip secured near the end of said magnetic member and having one of the plate edges extending into said transverse armature groove, and a flat platelike retaining member secured near the end of said magnetic member and having a portion around said armature to retain said armature groove on said pivot strip.

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