June 24, 1930. J. E. WILLING 1,766,577

RELAY MOUNTING MEANS

Filed Nov. 17, 1926

FIG. 1.

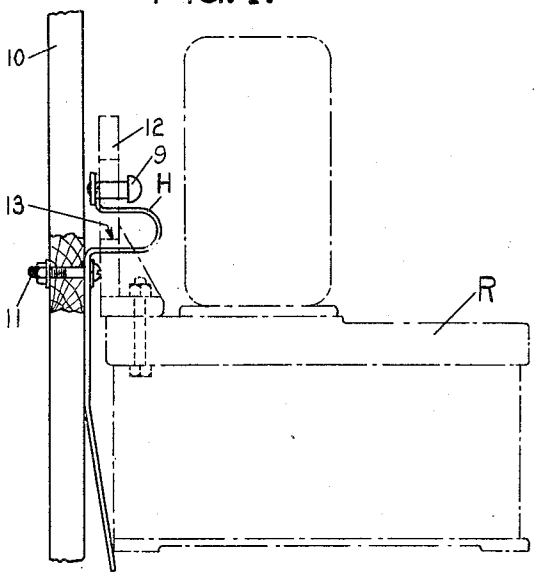


FIG. 2.

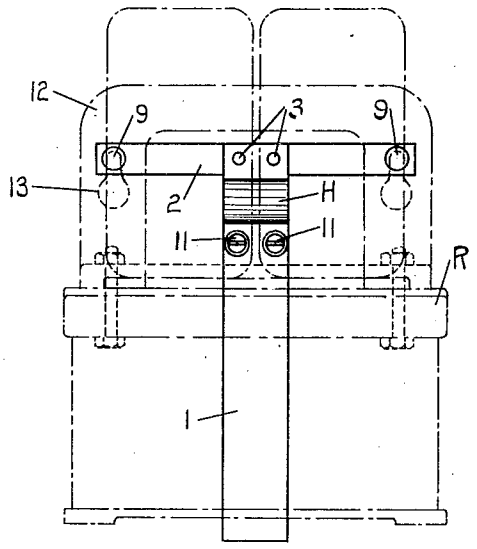
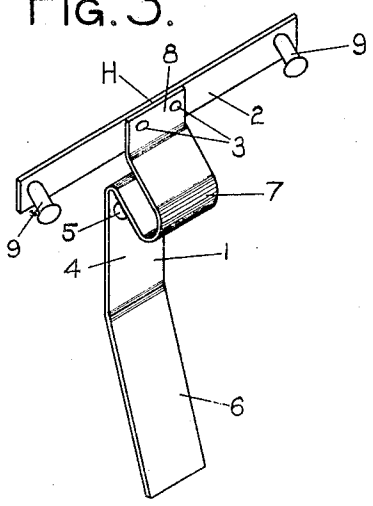


FIG. 3.



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UNITED STATES PATENT OFFICE

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RELAY-MOUNTING MEANS

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This invention relates to a spring suspension mounting for relays, and more particularly to a suitable mounting for direct current relays used in connection with railway signalling systems.

In relays of this type which are usually mounted in towers, signal boxes, and relay boxes located along the railroad track, considerable trouble is experienced as the passing trains cause jars and vibrations which affect the relays to the extent of dropping their armatures and causing false indications and other inconveniences.

In view of the above, it is proposed to mount these relays on a hanger which is made up of strips of spring steel or other suitable spring material in such a way that the jars and vibrations received from the casing or wall which supports the spring hanger will be taken up by said spring hanger and at most merely cause the relay to vibrate slightly.

Other objects and characteristic features of the invention will be pointed out as the description of the invention progresses.

In describing the invention in detail reference should be made to the accompanying drawings in which:—

Fig. 1 is a side elevation of the spring hanger comprising the invention, this spring hanger being shown mounted on a wall and having a relay (indicated by dot and dash lines) hanging thereon.

Fig. 2 is a front elevation of the devices shown in Fig. 1, and

Fig. 3 is a perspective view showing the spring hanger in detail.

Referring more particularly to Fig. 3 of the drawings, the spring hanger H is composed of a substantially vertical strip 1 of spring steel or other suitable material having a horizontal strip 2 of the same material riveted thereto by rivets 3, forming a structure of general T shape. The vertical strip 1 is of the general shape shown, having a flat portion 4 which is provided with holes 5, a lower end portion 6 which is bent away to the right of the flat portion 4, and an upper portion which is also bent away to the right of the flat portion 4 and is turned up to form a portion of general U-shape 7, this U-shaped portion 7 having an upturned vertical end 8 to which the horizontal strip 2 is riveted as described hereinbefore. The horizontal strip 2 is provided at each end with a projecting stud 9 having an enlarged head. This spring hanger H is provided with the various parts and shaped as shown for reasons described hereinafter.

Referring to Figs. 1 and 2, the spring hanger H is shown fastened to a tower rack or side of a relay box 10 by bolts or screws 11 passing through the holes 5, this arrangement holding the flat portion 4 against the wall and leaving the upper and lower end portions projecting out and away from the wall. For the purpose of illustration a standard form of railway signalling relay has been shown in dot and dash lines, this relay being the type shown in the patent of Salisbury M. Day, No. 1,703,837, granted February 26, 1929. This relay R has a supporting bracket 12 fastened thereto, this bracket 12 being hollowed out in the center and provided with an elongated hole 13 in each side, these holes having one end enlarged as shown. When hanging the relay on the spring hanger the enlarged head of the rivet 9 passes through the enlarged part of the hole 13. The relay is then allowed to drop down, the main body of the rivet 9 fitting snugly in the upper part of the hole 13 and the enlarged head of the rivet 9 then holds the relay in place. This allows the base plate of the relay to rest against the lower bent out portion 6 of the spring hanger thereby holding the relay in an upright position. The protruding U-shaped portion 7 extends within the hollowed out portion of the supporting bracket 12.

As mentioned hereinbefore, the spring hanger H is bolted to its supporting wall at only one point as shown, having just a small portion near its center resting against the wall, merely enough to hold it erect and allow it, with the aid of the lower bent out portion 6 and the upper U-shaped portion 7 and cross strip 2, to support the relay in such a way that it will be in a vertical position

and still not come in contact with the supporting wall itself.

With the spring hanger H supported in this way and by reason of its specific construction and its cooperation with the bracket of the relay the relay is in fact resiliently supported about this localized point 4. This construction permits the relay to bob in a vertical plane about this point 4, allows it to move in a horizontal plane about this point, and if it can move in a horizontal plane and in a vertical plane about a point it obviously can move in any direction about such point. Also, it will be noted that the relay is directly supported by the spring hanger by the rivets 9, and bears against this spring hanger at the extreme lower end thereof, and by reason of this fact the relay as a whole is movable toward and away from the wall. Further, it will be noted that the U-shaped portion 7 of the spring hanger resiliently supports the relay as far as up and down movement is concerned, so that the relay is supported for up and down translating movement. In other words, the novel spring hanger as specifically illustrated, and showing one embodiment of the present invention, supports the relay resiliently for movement in each and every direction, and jars or vibrations may be transmitted to the wall supporting the same, regardless of whether these jars or vibrations are rectilinear or curvilineal.

It should be noted that the lower end of the spring hanger H bears against the lower edge of the relay R so as to support the relay R vertically, and that there will be rubbing engagement between this lower end 6 and the relay R for every deformation of the spring hanger. This rubbing or frictional engagement between the relay and the end 6 of the spring hanger H tends to absorb the kinetic energy of vibration transmitted to the relay to cause bobbing thereof, and this absorption of the energy by frictionally converting the energy to heat will cause the bobbing to subside.

In connection with railway signaling it is extremely important that the contacts of the relays should not be opened even momentarily due to vibration jars or the like, because many of these relays are stick relays and of which each has its own energizing circuit passing through its own front contact, and possibly also through front and back contacts of other relays, from which it readily appears that opening of any of these contacts, even though only momentary will cause stick relay to be permanently deenergized, and by reason of this fact the present invention is of particular importance in connection with railway signaling.

After reading over the above description and referring to the drawings it can readily be seen that a novel relay supporting means has been provided which will satisfactorily protect the relay and its contacts from the direct shocks and vibrations to which a railway signaling relay is usually subjected. It should also be noted that the construction of this supporting means permits slight movement of the relay in practically every direction so that there is no possible chance of the relay being held rigidly in any one position wherein it would be subject to a direct shock or jar.

Having thus shown and described my invention in detail, I desire to have it understood that this invention should not be limited to the construction pointed out herein as it is obvious that various other constructions could be provided for this and other type relays without departing from the spirit and scope of the present invention, this type of relay and construction being chosen merely for the purpose of illustration.

What I claim is:—

1. A spring hanger for supporting relays in railway signalling systems comprising, a spring member having holes near the middle therein for screw fastening the same to a vertical wall, said spring member having its upper and lower portions bent inwardly to be spaced from the wall so as to leave a comparatively small area of contact with such vertical wall, a cross arm fastened to said upper portion and having means associated therewith for so supporting a relay that the lower edge of the relay bears against the lower forwardly bent portion of the spring member, said spring member being looped inwardly between said middle and said arm so that the relay is mounted for yielding in a horizontal plane about the point of support as a pivot.

2. A spring hanger for supporting relays in railway signalling systems comprising, a spring member having holes near the middle therein for screw fastening the same to a vertical wall, said spring member having its upper and lower portions bent inwardly to be wholly out of contact with the wall so as to leave a comparatively small area of contact with such vertical wall, a cross arm fastened to the upper portion and wholly out of contact with the wall, means associated with the arm for supporting a relay so that the lower edge of the relay bears slidingly against the lower forwardly bent portion of the spring member, the spring member being looped inwardly to permit vertical yielding of the spring member under the weight of the relay to cause frictional rubbing engagement of the lower edge of the relay with said spring member to absorb the kinetic energy stored in the moving parts.

3. A spring hanger for supporting relays in railway signalling systems comprising, a spring member having means near the mid-

dle thereof for rigidly fastening the same to a vertical wall, said spring member having its upper and lower portions bent inwardly of the wall to be wholly spaced therefrom so as to leave a comparatively small area of contact with such vertical wall, and a cross arm fastened to the upper portion and spaced from the wall and having means associated therewith for supporting a relay so that the lower edge of the relay bears against the lower inwardly bent portion of the spring member, the upper part of said spring member between said middle part and said arm, having a portion thereof looped inwardly so as to resiliently support said relay in a vertical plane.

4. A spring hanger for resiliently supporting sensitive instruments, comprising a spring strip, means at the central portion of the strip for fixing it to a vertical support, the upper and lower portions of said strip being bent inwardly to be entirely out of contact with the support when the hanger is in place, a cross arm fixed to the upper end of said upper portion and wholly out of contact with the support when the hanger is in place, spaced studs carried by the cross arm for positively connecting it to an instrument to carry the instrument with is side bearing only slidingly against said lower portion, to thus furnish a vertical-plane three point support for the instrument.

5. A spring hanger for resiliently supporting sensitive instruments, comprising a spring strip, means at the central portion of the strip for fixing it to a vertical support, the upper and lower portions of said strip being bent inwardly to be entirely out of contact with the support when the hanger is in place, a cross arm fixed to the upper end of said upper portion and wholly out of contact with the support when the hanger is in place, spaced studs carried by the cross arm for positively connecting it to an instrument to carry the instrument with its side bearing only slidingly against said lower portion, to thus furnish a vertical-plane three point support for the instrument and an unsupported, floating, loop in said strip between said cross arm and said central portion, to resiliently carry said cross arm and attached instrument.

In testimony whereof I affix my signature.

JOSEPH E. WILLING.