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2,532,624

ELECTRIC RELAY

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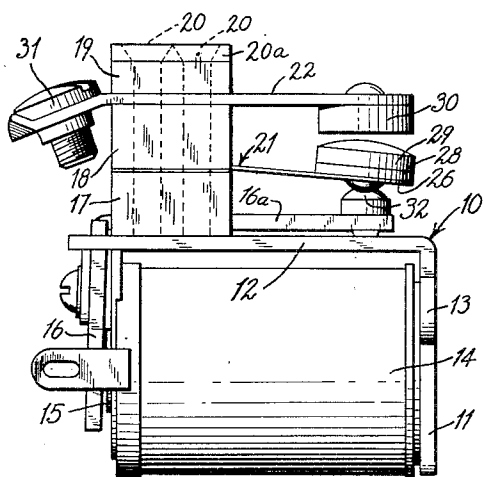


Fig. 1.

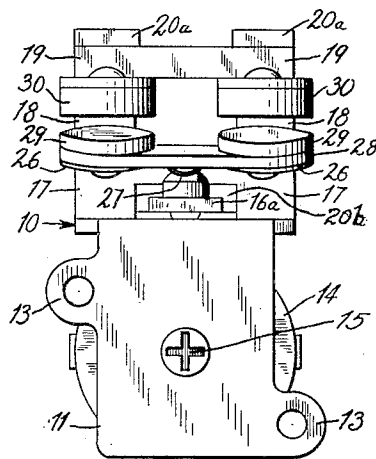


Fig. 2.

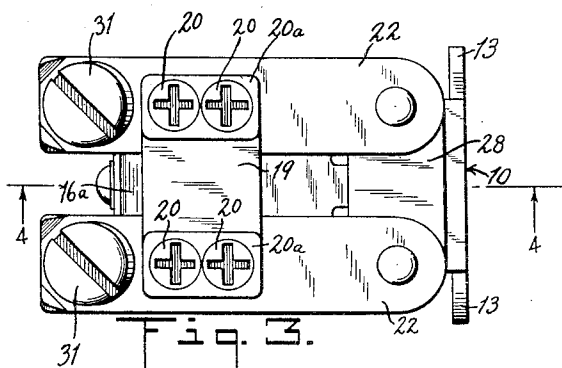


Fig. 3.

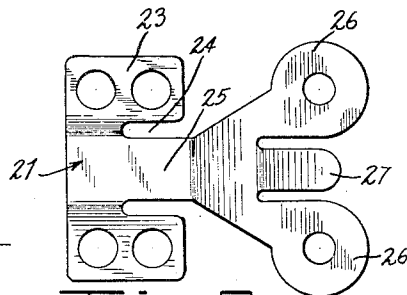


Fig. 4.

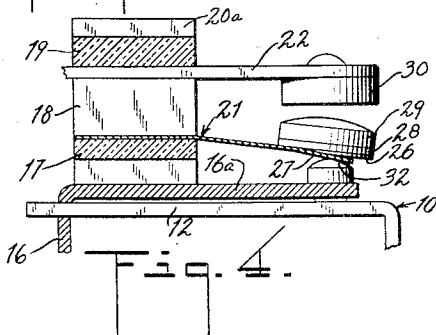


Fig. 5.

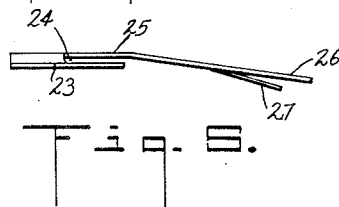


Fig. 6.

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ELECTRIC RELAY

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8 Claims. (Cl. 200—87)

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This invention relates to electric relays and more especially to contact armature structure.

Heretofore relays in general and particularly those designed for heavy duty have been equipped with some form of spring for returning the armature to its de-energized or open position.

An object of this invention is a contact arm structure particularly adapted to heavy duty relays, but applicable also to other types of electric relays in which the need for a separate armature return spring is eliminated.

Other objects, novel features and advantages of this invention will become apparent from the following specification and accompanying drawings, wherein:

Fig. 1 is a plan view of a relay embodying the invention;

Fig. 2 is a side elevation of Fig. 1;

Fig. 3 is an end elevation of Fig. 1;

Fig. 4 is a fragmentary section on the line 4—4 of Fig. 3;

Fig. 5 is a plan view of a detail, and

Fig. 6 is an edge view of Fig. 5.

An L-shaped magnetic metal frame 10 has a short leg 11 and a long leg 12 and the leg 11 is provided with apertured extensions 13 for attachment purposes. A coil 14 and a core 15 centrally thereof are supported by the leg 11, while the leg 12 pivotally supports an armature 16 overlying the end of the core 15 and having an extension 16a substantially parallel to the leg 12. An insulating block composed of three superposed units 17, 18 and 19 is attached to the leg 12 by bolts 20 passing through plates 20a, the lower unit 17 being suitably cut away to provide a passageway 20b through which the armature extension 16a projects and the unit 18 being composed of two spaced sections.

A thin sheet metal contact supporting plate 21 is clamped between the units 17 and 18 while a pair of rigid contact arms 22 are clamped between the units 18 and 19. The plate 21 consists essentially of a head 23 of the same configuration as the unit 17 and slit as at 24 to form a neck 25 terminating in two arms 26 forming a Y with the neck 25. That portion of the head 23 in alignment with the neck 25 is offset slightly from the remainder as shown in Fig. 6. A tongue 27 located between the arms 26 has its free end slightly offset downwardly from the plane of the arms 26. A contact bar 28 is attached to the ends of the arms 26 and supports a pair of contacts 29. Each contact arm 22 supports a contact 30 for engagement by a contact 29 and each contact arm is provided with a terminal 31.

The armature extension 16a is provided with a button 32 of insulating material for engagement with the tongue 27 of the plate 21. The plate 21 is biased to separate the contacts 29

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from the contacts 30 and by engagement of the tongue 27 with the button 32 the plate 21 also biases the armature 16 into its open position.

Energization of the coil 14 causes attraction of the armature 16 toward the core 15 with consequent elevation of the button 32 to engage the contacts 29 with the contacts 30 so that the bar 28 constitutes a bridge between the contact arms 22. Upon de-energization of the coil 14, the bias of the plate 21 causes separation of the contacts and return of the armature to its open position.

I claim:

1. A relay comprising a frame, an armature pivoted on said frame and having an extension, a block of insulating material fixed with respect to said frame, a resilient sheet metal plate supported by said insulating block in overlying relation to said armature extension, said plate having a neck and arms forming a Y-shaped section and a tongue-like extension from the apex of said arms with a free end projecting between said arms, said extensions being juxtaposed for mutual engagement whereby said armature extension may engage said tongue-like extension to bend said plate.

2. A relay comprising a frame, an armature pivoted on said frame and having an extension, a block of insulating material supported by said frame, a resilient sheet metal plate supported by said insulating block in overlying relation to said armature extension, said plate having a neck and arms forming a Y-shaped section and a tongue-like extension from the apex of said arms with a free end projecting between said arms, said tongue-like extension being offset angularly from the plane of said arms, and a button of insulating material supported by one extension for engagement with the other extension.

3. A relay comprising a frame, an armature pivoted on said frame and having an extension, a block of insulating material supported by said frame and having a passageway through which said armature extension projects, a resilient sheet metal plate supported by said insulating block in overlying relation to said armature extension, said plate having a neck and arms forming a Y-shaped section and a tongue-like extension from the apex of said arms with a free end projecting between said arms, and a button of insulating materials supported by one extension for engagement with the other extension.

4. A relay comprising a frame, an armature pivoted on said frame and having an extension, a block of insulating material supported by said frame and having a passageway through which said armature extension projects, a resilient sheet metal plate supported by said insulating block in overlying relation to said armature extension, said plate having a neck and arms forming a Y-shaped section and a tongue-like extension

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from the apex of said arms with a free end projecting between the said arms, said tongue-like extension being offset angularly from the plane of said arms, and a button of said insulating material supported by one extension for engagement with the other extension.

5. A relay according to claim 1 characterized by a bar supported by said Y arms, a pair of contacts mounted on said bar, and a pair of rigid contact arms supported by said block for cooperation with said contacts.

6. A relay according to claim 3 characterized by a bar supported by said Y arms, a pair of contacts mounted on said bar, and a pair of rigid contact arms supported by said block for cooperation with said contacts.

7. A relay as in claim 1 including contact means on said Y arms, rigid contact means supported by said block for cooperation with said first contact means, said sheet metal plate engaging said armature so as to bias said armature extension towards said frame.

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8. A relay as in claim 3, including contact means on said Y arms, rigid contact means supported by said block for cooperation with said first contact means, said sheet metal plate engaging said armature so as to bias said armature extension towards said frame.

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