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C. SAVAGE

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ELECTRICAL CONTACT MOUNTING

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Fig. 1.

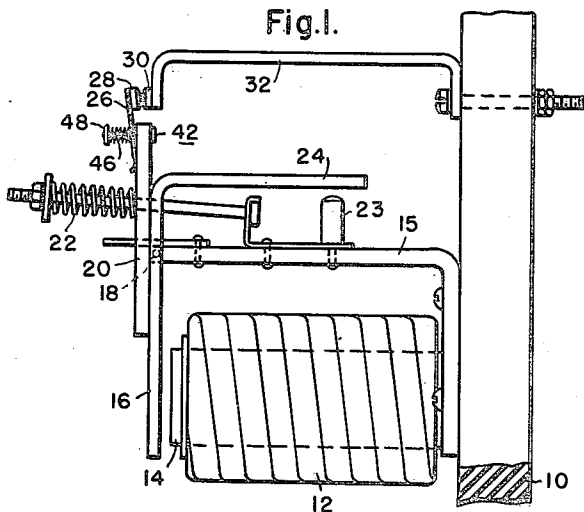


Fig. 5.

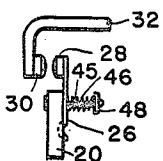


Fig. 2.

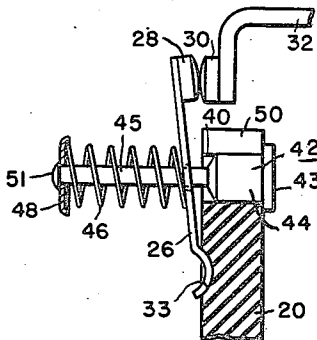


Fig. 2A.

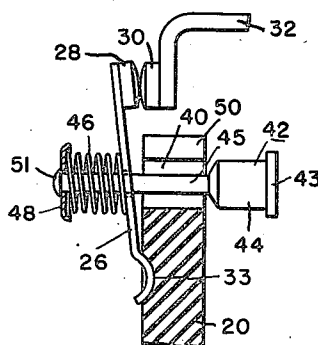


Fig. 3.

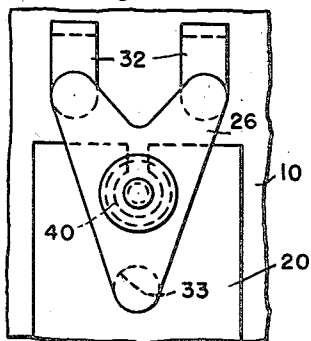
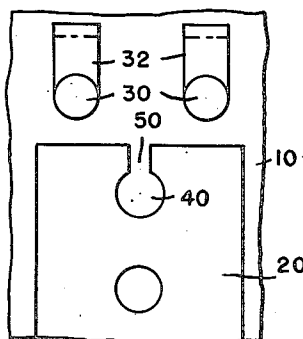


Fig. 4.



WITNESSES:

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## UNITED STATES PATENT OFFICE

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## ELECTRICAL CONTACT MOUNTING

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5 Claims. (Cl. 200-166)

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The invention relates to electrical contactors and relays such as are employed in control circuits of various types, and particularly to an improved contact mounting for such devices.

Electrical contactors for control purposes must of course be rugged and able to withstand many repeated operations. The contacts themselves are subject to substantial wear and must be capable of being serviced or replaced at a minimum expense consistent with proper operation of the control circuit with which they are associated. In a control circuit for a passenger elevator, for example, a great number of contactors and relays may be employed involving literally hundreds of contacts which of course are vital in the proper operation of the elevator system. In servicing such a system it is obviously desirable to be able to replace contact members which have become worn, or defective, as expeditiously as possible without having to replace the contactor or relay itself.

Accordingly, it is an object of the present invention to provide an electrical contact device which embodies unusually good operating features and is securely fastened in place, and at the same time is such that it may readily be removed for replacement or repair.

It is a further object of the invention to provide a resilient mounting for an electrical contact which may readily be placed in service or removed by a simple operation.

Other objects of the invention will become apparent from the following description and accompanying drawing, in which:

Figure 1 is a view in side elevation of a contactor with which the present invention may be employed,

Figs. 2 and 2A are views on an enlarged scale partly in section of a contact mounting shown in Fig. 1,

Fig. 3 is a plan view of the contact member shown in Fig. 2,

Fig. 4 is a view of the contact mounting with contact member removed,

Fig. 5 is a fragmentary view of a modification of the contact device mounting.

Referring to Fig. 1, the contactor includes a base 10 having suitably mounted thereon a coil or winding 12 surrounding a core 14, and a supporting metallic bracket 15. An armature 16 pivoted as at 18, in any desired manner confronts the end of the core 14, and upon energization of winding 12, it will be attracted to the core.

A contact supporting member 20, preferably of a moulded electrically insulating material, is car-

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ried by the armature 16 for movement therewith, and a spring 22 is effective to bias the armature to the position shown in Fig. 1. The extent of movement of the armature under the influence of the spring 22 may be limited by a stop 23 for engagement by an extension 24 of the armature 16.

A contact-carrying plate 26 is resiliently mounted on the insulating member 20. Such a plate is generally of V-shape (Fig. 3) and of metal. A pair of contact members 28 are suitably secured to the plate, as by welding, in position to engage, respectively, a pair of fixed contacts 30 supported from the base 10 of the contactor by conducting straps 32. In the construction shown by way of example, the contacts 30 are to be engaged by the contacts 28, which with the plate 26 constitute a bridging connection between the contacts 30.

The end of the plate 26, opposite to the contacts 28 is provided with a rounded depression 33 (Fig. 2), which is a rounded projection as viewed from the contact-side of the plate, and the member 20 is formed with a rounded recess to receive such projection, the projection and recess constituting in effect a ball-and-socket joint about which the plate may be tilted.

The insulating member 20 is provided with a circular opening 40 extending through it for the reception of a mounting pin or rivet 42, having a head portion 43 of greater diameter than said opening, a body portion 44 for reception in said opening with a sliding fit, and a stem portion 45 of reduced diameter.

The stem portion 45 of the pin passes through an opening in the contact plate 26, and a compression spring 46 is confined between the plate and the free end of the pin by a cap 48 which is secured to the pin by a riveted or upset portion 51 thereof.

As shown more clearly in Fig. 4, a slot 50 extends from the edge of the member 20 into communication with the opening 40, and is of a width slightly larger than the diameter of the pin stem 45, but substantially smaller than the diameter of the pin body portion 44. By such construction, and upon compression of the spring 46 between the contact plate 26 and the cap 48, the contact assembly may be mounted in operative position by moving the stem 45 laterally through the slot 50 into the opening 40, whereupon release of the spring will draw the pin body portion 44 into the opening with the parts resiliently locked in the position shown in Fig. 2.

When a contact assembly is to be removed, for

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replacement or servicing, the spring is compressed, as indicated in Fig. 2A, bringing the stem 45 into register with the slot 50 to permit removal of the contact assembly therethrough.

The arrangement of contacts thus far discussed has been of the "break" type, that is, contacts which are normally closed but are opened when the contactor winding is energized. A reversal of this of course, is a normally open or "make" contact as indicated in Fig. 5.

Quite obviously, modifications may be made in the specific construction illustrated, and it is intended that the invention be limited only by the spirit and scope of the appended claims.

I claim as my invention:

1. A detachable mounting for an electrical contact comprising a support having a hole therethrough and a slot communicating therewith having a width substantially less than the lateral dimension of said hole, a contact-carrying plate overlying said hole on one side of said support and resilient means for securing it in such position comprising a pin extending through said hole and loosely through said plate, means engaging the opposite side of said support limiting the movement of said pin toward said plate, and resilient means reacting between said pin and plate biasing said plate against said support, said pin having an enlarged portion disposed in said hole with a sliding fit, and a reduced portion of a lateral dimension such that it may enter said slot when brought into registration therewith.

2. A detachable mounting for an electrical contact comprising a supporting member having an opening therethrough adjacent an edge thereof and a slot of reduced lateral dimension extending from said opening to said edge affording access to said opening, a contact device, means for exerting a spring bias forcing said device against said supporting member including an elongated pin having an end portion of greater lateral dimension than said opening to prevent movement therethrough, an intermediate portion of a dimension to permit a sliding fit in said opening and a portion of reduced lateral dimension to permit removal of the pin through said slot, and resilient means reacting between said pin and contact device to retain said intermediate portion in said opening.

3. In combination with a support having an opening therethrough, a contact-carrying plate overlying said opening on one side of said support and means for resiliently retaining it in such position comprising a pin extending through said opening and plate, means on one end of said pin engaging the other side of said support to limit the movement of the pin through said opening, and a spring member disposed between the

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other end of said pin and said plate, said pin having a portion of lateral dimension such that it constitutes a sliding fit in said opening and a portion of reduced lateral dimension, a slot communicating with said opening throughout the length thereof and having a width such that said pin portion of reduced lateral dimension may be passed into the slot when the pin is moved against the bias of the spring member to bring the reduced pin portion opposite to said slot.

4. A mounting device for an electrical contact comprising a supporting member having a key-hole-shaped slot extending therethrough, a contact-carrying plate overlying said slot on one face of said support, a mounting pin extending through said slot and through a hole in said plate, said pin having an enlarged head portion engaging the other face of said supporting member, a body portion proportioned to fit within the enlarged portion of said slot and a stem portion proportioned to be movable into the narrow portion of said slot, and a compression spring surrounding said stem portion connected at one end thereto and bearing against said contact-carrying plate.

5. In a removable resiliently-mounted device including a support having a hole therethrough, a support having a circular opening extending from one face to another, means for resiliently mounting said member in operative position overlying said opening on one face of said support including a pin extending through said opening and hole and having a head portion abutting the other side of said support, a body portion on said pin proportioned to slidably fit in said opening when the pin and member are in operative position, a compression spring surrounding the free end of said pin and secured at one end thereto and bearing against said member, and a slot communicating with said opening parallel to the axis thereof, at least a portion of the free end of said pin being proportioned to be received in said slot by a lateral movement when moved into registration therewith by manual compression of said spring.

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#### REFERENCES CITED

The following references are of record in the file of this patent:

#### UNITED STATES PATENTS

| Number    | Name        | Date          |
|-----------|-------------|---------------|
| 1,751,444 | Cohn et al. | Mar. 8, 1930  |
| 1,839,095 | Goetz       | Dec. 29, 1931 |

#### FOREIGN PATENTS

| Number  | Country | Date          |
|---------|---------|---------------|
| 867,777 | France  | Sept. 1, 1941 |