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ADJUSTABLE RELAY CONTACT

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Fig. 1

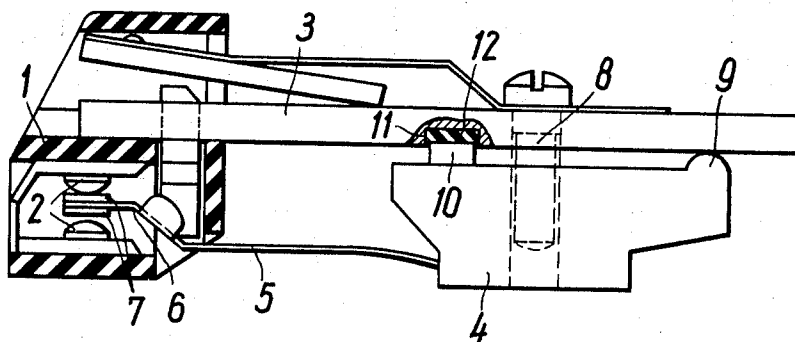
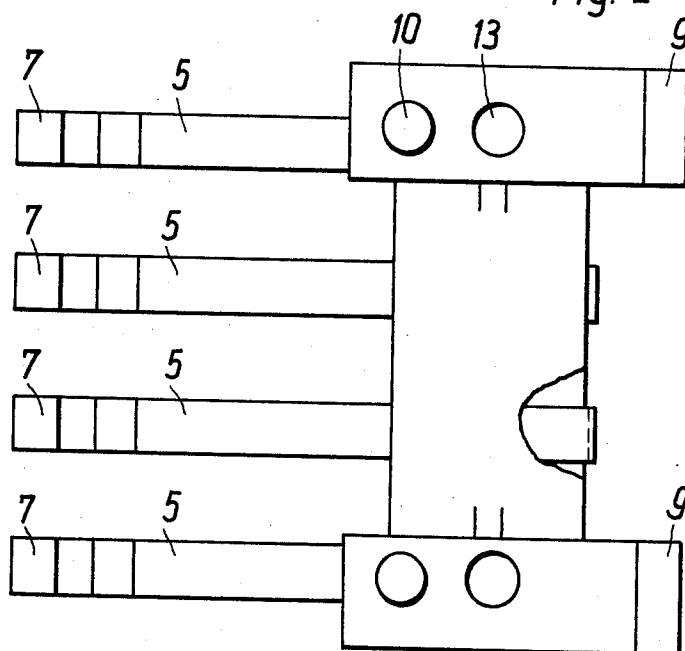


Fig. 2



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ATTORNEYS

1

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## ADJUSTABLE RELAY CONTACT

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8 Claims

### ABSTRACT OF THE DISCLOSURE

A relay having at least one break contact fitted to a break-contact holder and with at least one operating contact mounted on an operating spring anchored to a spring adjustment member.

### BACKGROUND OF THE INVENTION

In relays of this type known hitherto, the anchorage of the operated contact springs is rigidly attached to the break-contact holder. The operating contact springs must, therefore, be adjusted individually in relation to the associated break contact or contacts, to establish proper connection and obtain a given contact pressure. This is done by hand, by specially trained staff. Such adjusting, however, is time-consuming and the contact pressure can be adjusted only somewhat imprecisely. The cost of such a relay is decisively affected by the expense involved in adjustment. No other simple methods are known whereby relays of existing types can be adjusted rapidly and reliably.

The purpose of the invention is to provide a relay and a method of adjustment such as to make the adjustment thereof simple and accurate.

This is achieved by the use of a relay characterised by the fact that a continuous pivoting movement can be imparted to the spring adjustment member, in relation to the break-contact component, by means of a regulating device.

Such a relay can be adjusted, in accordance with the method here proposed, by fitting the spring adjustment member to the break-contact holder, by using a regulating device to cause the adjustment member to pivot towards the break-contact holder until the operating contact touches the break contact and then, again with the aid of the regulating device, by causing the spring adjustment member to continue its pivoting movement, to ensure contact pressure between the break contact and the operating contact.

The method described enables the relay described to be adjusted quickly and accurately, even by less highly trained staff. The labour costs involved in manufacture are thus considerably lower than with the relays known hitherto.

### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevation of the relay conforming to the invention; and

FIG. 2 shows the spring adjustment member seen from above.

### DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawing, FIG. 1 shows a relay incorporating a contact holder 1, with four facing pairs of make and break contacts 2. The elongated parts 3 of the contact holder 1 form the outer arms of an E-shaped magnetic circuit, the middle arm of which serves as a coil core. Below those parts 3 which constitute the outer

2

arms of the magnetic circuit is a plastic component acting as a spring adjustment member 4. Molded into this spring adjustment member 4 are four operating springs 5, lying in one and the same plane, with their free ends 6 extended between the facing pairs of fixed contacts 2. An operating contact 7, is provided on the free ends of the operating springs 5, between the fixed contacts.

The spring adjustment member 4 is secured by two self-tapping screws 8, to the drilled elongated outer arms of the magnetic circuit. Two protruberances 9, on the spring adjustment member 4 bear against the outer arms 3 of the E-shaped magnetic circuit and act as a fulcrum for the adjustment member. The latter also has two small projections 10, which engage in holes 11, containing small silicone rubber cushions 12, to provide resilience.

FIG. 2 shows the spring adjustment member 4 as seen from above. At the end remote from the operating springs 5 are the elongated protruberances 9. At or near the end adjacent to the operating springs are the two projections 10, while the holes 13 entered by the self-tapping screws 8 lie between the said protruberances and projections. As the self-tapping screws are tightened, the spring adjustment member 4 is turned about its pivot, thereby compressing the small cushioning members.

To adjust the relay, the spring adjustment member 4 is first placed against the elongated parts used as the outer arms of the magnetic circuit. Then the screws 8 are fitted through the holes in the elongated parts 3 and screwed into the holes 13 in the spring adjustment member 4. This pulls the spring adjustment member initially towards the elongated part 3 of the contact holder 1 and then swings it about the elongated protruberances 9. The screws 8 are tightened until the operating contacts 7 touch the upper break contacts. If a source of current and an ammeter be joined in series to the break contact and operating contact, the establishment of connection between the operating contact 7 and the break contact 2 can be readily confirmed by reading on the ammeter the current that starts to flow as the contacts touch. Then, to obtain a given contact pressure, the screws 8 are further turned through a given angle, so that the spring adjustment member 4 likewise turns through a given angle, requisite to the production of a given contact pressure.

When the spring adjustment member 4 used has several operating springs 5—four, for example, as shown in FIG. 2—these four operating springs 5 should be molded initially in one and the same plane into the spring adjustment member 4, to give them a particular basic alignment. Then, even if the four operating springs do not lie precisely in the same plane, they can still be aligned by eye, without much difficulty, before the spring adjustment member is incorporated into the relay.

The process of adjustment can be carried out rapidly, even by less highly trained staff, the precision of adjustment still being greater than when contacts are adjusted by bending the individual springs.

Though the adjusting device and method of adjustment described are particularly suitable for electro-magnetic relays, they can equally well be applied to other relays in which the operating contacts are mounted on contact springs or the like.

What is claimed is:

1. A relay comprising at least one break-contact fitted to a break-contact holder and with at least one operating contact mounted on an operating spring anchored to a spring adjustment member by which the operating spring is pivotable; said spring adjustment member being pivotable by means of a regulating device including at least one screw-like means extending through said break-contact holder and engaging said spring adjustment member,

and resilient cushioning means are provided in an element extending from said break-contact holder so as to act against the pivoting of the said spring adjustment member when said screw-like means is tightened.

2. A relay according to claim 1, wherein said resilient cushioning means comprise members which lie facing the end of said spring adjustment member.

3. A relay according to claim 2, wherein said resilient cushioning members comprise small pieces of resilient material held in apertures in the said element extending from said break-contact holder.

4. A relay according to claim 3, wherein said spring adjustment member carries projections, which fit into said apertures in the said element extending from said break-contact holder.

5. A relay according to claim 3, wherein said resilient cushioning members comprise silicone rubber.

6. A relay according to claim 1, wherein said spring adjustment member has several contacts on several operating springs aligned in a row.

7. A relay according to claim 1, wherein said screw-like means is adapted to be turned in one direction so that said spring adjustment member is turned about a line-contact pivot or fulcrum point provided on said spring adjustment member, in opposition to the action

of said resilient cushioning means, towards the said element extending from said break-contact holder; and when said screw-like means is turned the opposite way, the spring adjustment member is turned away from the said element extending from said break-contact holder by the action of said resilient cushioning members.

8. A relay according to claim 7, wherein said line-contact pivot of said spring adjustment member comprises an elongated protuberance on the end of said spring adjustment member which is remote from the operating springs, and said protuberance bearing against said element extending from said break-contact holder.

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335—194; 337—374