Feb. 16, 1965 R. SCHEIDIG 3,170,053

REED CONTACT ARRANGED WITHIN A PROTECTIVE ENVELOPE

Original Filed Nov. 18, 1959

Fig.1

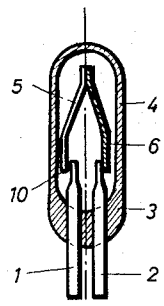


Fig.2

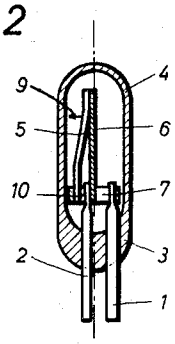
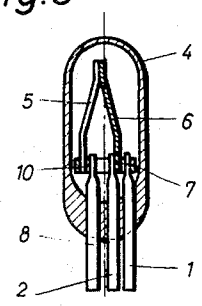


Fig.3



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REED CONTACT ARRANGED WITHIN A PROTECTIVE ENVELOPE

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Continuation of application Ser. No. 853,774, Nov. 18, 1959. This application Oct. 1, 1963, Ser. No. 313,043
Claims priority, application Germany, Dec. 6, 1958, St 14,534
2 Claims. (Cl. 200—87)

This application is a continuation of my copending application Serial No. 853,774, filed November 18, 1959, and entitled "Reed Contact Arranged Within a Protective Envelope," now abandoned.

The present invention relates to a reed contact arranged within a protective envelope, and which is capable of being actuated by a magnetic field, as is already known per se.

In one conventional type of embodiment which has the advantage over other conventional types of reed contacts having a very short overall length, the conductors provided for establishing the connection with the reed contact, are arranged at one and the same end of the protective envelope. The stationary contact part is short, and the moving contact part is a long bifurcated form for providing a sufficient resiliency.

This prior art construction, however, has a disadvantage. A compression of the magnetic field in the airgap between the two contact parts is necessary to move producing the force required for the contact. But this compression can only be produced if the limb of the bifurcated contact part, forming a magnetic shunt therewith, has a resistance value which is comparable with the resistance of the airgap. This resistance value occurs when the contact part has a high saturation. This construction, however, requires a very high magnetomotive force.

It is now the object of the present invention to eliminate this drawback and, by maintaining the small overall length, to achieve a sufficient contact-making force with an unobjectionably reliable function, and yet requiring a small as possible magnetomotive force. According to the invention this is accomplished in that the moving part of the reed contact consisting of a ferromagnetic material, with the aid of a stationary part not consisting of a ferromagnetic material, is secured to a connecting conductor, whereby both parts of the reed contact preferably have the same or almost the same rigidity (inflexibility).

In further embodying the construction of the reed contact according to the invention, it is possible to provide a switch-off contact, by designing the contact in such a way that the moving part of the reed contact is provided with a portion of a non-ferromagnetic material conductively touching the connecting conductor which is not connected with the moving part of the reed contact, by way of an elastic bias, thus forming a switch-off contact.

According to a further modification of this type of embodiment it is possible to construct a switchover contact by inserting between the moving part of the reed contact and the connecting conductor which is in a conductive connection therewith via the non-moving (stationary) part of the reed contact, a further connecting conductor in such a way that by the conductive touch or contact of this conductor with the moving part of the reed contact by separating the contact of the part from the connecting conductor which is not in a fixed conductive connection with the moving part of the reed contact, and upon actuation of the reed contact by a magnetic field, this conductor will perform the function of a switch-over contact between the connecting conductors.

In FIGS. 1–3 of the accompanying drawing there are

shown some examples of embodiment of the contact according to the invention:

In FIG. 1 there is shown a switch-on contact,

In FIG. 2 there is shown a switch-off contact, and

In FIG. 3 there is shown a switch-over contact.

The connecting conductors **1**, **2**, **8** of a ferromagnetic material are inserted at one and the same end **3** of the protective envelope **4** which, in the manner known per se, may either be filled with a protective gas, or may be evacuated of air. The moving part **5** of the reed contact, in a likewise conventional manner, consists of a ferromagnetic material. This material may either be of the ferromagnetically soft kind or, for achieving any probably wanted remanence effects, may also be of the ferromagnetically hard kind.

The electrically conductive connection between the connecting conductor **2** and the moving part **5** of the reed contact is established by a part **6** of the reed contact consisting of a non-ferromagnetic material, preferably having the same elastic rigidity as the moving part **5** of the reed contact. In FIGS. 1–3 the parts consisting of the non-ferromagnetic material are indicated by the shaded portions. The moving part **5** of the reed contact consisting of a ferromagnetic material is arranged in such a way that the contact opening is arranged on the side of the connecting conductor **1** not facing the connecting conductor **2**, because on account of this the lines of stray flux extending from the connecting conductor **2** to the contact part **5** are capable of being utilized as well for actuating the contact.

The switch-off contact as shown in FIG. 2 is provided with a moving part **5** of the reed contact consisting of a ferromagnetic material, carrying a part **7** consisting of a non-ferromagnetic material. This part **7** is adapted to establish the conductive connection between the connecting conductor **2** and the connecting conductor **1** in that it is pressed by the part **5**, with the aid of an elastic or flexible bias, which is indicated by the arrow **9**, against the connecting conductor **1**.

Under the influence of a magnetic field the moving part **5** of the reed contact is moved towards the connecting conductor **2**, thereby separating the part **7** from the connecting conductor **1**, so that the switch-off contact will be opened.

FIG. 3 finally, shows a combination of a switch-on contact according to FIG. 1 with a switch-off contact according to FIG. 2, for forming a switch-over contact. The three connecting conductors **1**, **2**, **8** are again attached to the same end **3** of the protective envelope **4**. The function of the switch-over contact will be easily understood from the description of the switch-on and switch-off contact given hereinbefore with reference to FIG. 3.

While I have described above the principles of my invention in conection with specific apparatus, it is to be clearly understood that this description is made only by way of example and not as a limitation to the scope of my invention as set forth in the objects thereof and in the accompanying claims.

I claim:

1. A reed contact assembly for controlling the continuity of at least one electrical circuit responsive to externally applied magnetic fields comprising a stationary contact of magnetic material and a movable contact sealed in a tube, said movable contact including a first blade of non-magnetic material and a second blade of magnetic material, said first and second blades being joined at one end to form a resilient bifurcated structure, means comprising the tip of the other end of said first blade for providing an electrical circuit through the wall of said tube and a fixed end mount for said resilient structure, the other end of said resilient structure being free to move, the

tip of the other end of said second blade being positioned adjacent said stationary contact, whereby substantially all of the flux in said magnetic field is compressed in the air gap between said stationary contact and said second blade and substantially none of said flux is shunted through said first blade, an elongated contact member attached to and supported by the other end of said second blade, said elongated contact member extending away from said blade at a substantially large angle approximating 90° with respect to the length of said bifurcated structure, said elongated contact member making or breaking an electrical circuit through said stationary contact depending upon whether said reed contact is normal or is operated, the other end of said second blade being positioned near a terminal leading through said wall, said elongated contact extension having a first portion positioned adjacent said stationary contact for movement into and out of electrical contact with the stationary contact and another portion movable into and out of electrical contact with said terminal.

2. A magnetically operated reed-contact assembly according to claim 1 wherein the said other end of said second blade makes electrical contact with the said terminal concurrently with a breaking of the electrical contact with the stationary contact.

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