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W. B. ELLWOOD
MULTICONTACT DRY REED RELAY

2,535,400

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FIG. 1

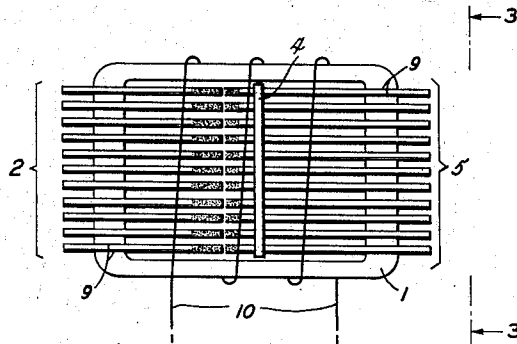


FIG. 2

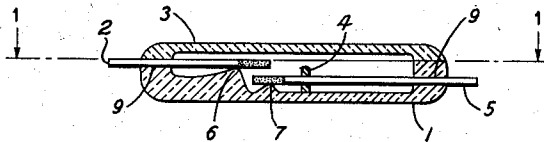
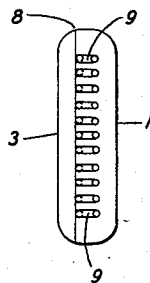


FIG. 3



INVENTOR
W. B. ELLWOOD
BY *J. W. Schmied*
ATTORNEY

UNITED STATES PATENT OFFICE

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MULTICONTACT DRY REED RELAY

Walter B. Ellwood, New York, N. Y., assignor to
Bell Telephone Laboratories, Incorporated, New
York, N. Y., a corporation of New York

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6 Claims. (Cl. 200—104)

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This invention generally relates to multicontact relays and more particularly to multicontact relays having a preformed base plate comprising seats for a plurality of contact electrodes contained therein.

An object of the invention is a multicontact sealed-in relay having a fixed spacing between the contact pairs thereof.

A further object of the invention is the improvement of multicontact relays generally.

The prior art appears to contain no multicontact relays having several switches enclosed in a preformed envelope. Such a relay has the advantage of having but one envelope and one coil for a number of switches. Obviously this will decrease the cost of manufacturing the relay, and will conserve space in installations in the many instances where the conservation of space is important. Furthermore, individual reed-type switches will sometimes stick together when they should break contact. In this invention a card is placed within the envelope and one reed of each contact pair is passed through the card. Since all the reed contacts operate together, any single ones that tend to stick will be pulled apart by the force of the other contacts transmitted through the card, thus virtually eliminating faulty operation due to the sticking of contacts.

One of the features of this relay is the preformed base plate of glass, ceramic, or other suitable material, which has formed therein preformed seats for the magnetic reed contacts of the individual switches. This assures the proper seating for the reed contacts so that the spacing and alignment of said contacts are correct.

A further feature of the relay is the use of a dish-like glass base plate and a glass cover therefor to form an air-tight container for the enclosed contacts. The above-mentioned objects and features of the invention along with other objects and features of the invention will become more apparent from the following detailed description of the drawings:

Fig. 1 shows a top view of the glass base plate with the reed contacts placed therein;

Fig. 2 illustrates a side view of the interior of the relay. This view illustrates the manner in which the preformed seats, glass cover plate and the glass base plate are arranged to insure spacing and alignment of the reed contacts; and

Fig. 3 illustrates an end view of the relay.

The components of the switch are a preformed glass base plate 1, round or rectangular, magnetic reeds 2 and 5 of an alloy which is sealable to glass such as 48 per cent nickel, 52 per cent iron

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alloy and plated with contact metal such as rhodium or some other suitable metal, and a molded glass plate 3. As shown in Fig. 2 the preformed molded glass base plate 1 has two ridges 6 and 7 which are molded into the glass base plate along with the slots 9 provided at the end of the glass base plate to provide further assurance for proper alignment. The ridges 6 and 7 are provided with a slight depression, one for each magnetic reed. These slight depressions in the preformed ridges and the slots in the ends of the glass base plate serve to align the magnetic elements longitudinally and also to produce the correct spacing between the overlapping ends when the magnetic reed elements are inserted.

The whole assembly is covered by a molded cover or cap plate 3 shown in Figs. 2 and 3 which has been previously prepared with a sufficient soft glass coating 8 on its edges to seal the whole assembly upon the application of heat.

The entire assembly is prepared in advance and sealed by placing in a furnace with an inert atmosphere and raising the temperature to the sealing point of the low melting point glass 8. It is essential that the low melting glass reach a fluid stage before the main molded glass cap or the base plate softens.

It is to be noted that this structure is not limited to glass for the preformed card 4 but that ceramics may also be used.

If it is desired to fill the structure with other chemically active or inactive gases a metal tube may be substituted for one of the magnetic elements. This tube can be used for completing and filling the space inside the cap after which it may be sealed shut.

Winding 10 provides the necessary magnetic field to actuate the contacts within the glass container.

If the magnetic reeds are made to pass through loosely fitting holes in an otherwise free ceramic card 4, the effects of the multiple card operation may be obtained. By this is meant that if any one of contact electrodes 5 tends to stick the retractile force of the others is applied through the card to break loose the sticking element.

The above description is of a preferred embodiment of the invention and various changes may be made in the material, size and arrangement without departing from the spirit and scope of the invention.

What is claimed is:

1. A multicontact relay comprising an envelope, a plurality of pairs of dry reed contacts arranged adjacent and parallel to each other, each pair of

said contacts comprising two reed contacts arranged longitudinally and parallel to each other, all of said reeds being secured within the walls of said envelope, a card having holes therein within said envelope, one dry reed contact of each of said pairs passing through said holes so a sticking contact will be forced to open due to the breaking retractile force of the other contacts transmitted by said card, coil means to cause said pairs of contacts to make and break an electric current path.

2. A multicontact relay comprising a plurality of magnetic reed contacts sealable to a formable insulating material, a base plate of said insulating material having preformed ridges for spacing and aligning said reed contacts, and a cover plate of said insulating material hermetically sealed to said base plate, said reed contacts being within the combination of said base plate and said cover plate.

3. A multicontact relay comprising a plurality of reed contacts sealable to ceramic, a ceramic base plate having preformed ridges for spacing and aligning said reed contacts, a ceramic cap plate hermetically sealed to said ceramic base plate, and a ceramic coating having a melting point lower than that of the said cap or base placed on the edge of said cap to provide the seal between said ceramic cap and said ceramic base, said reed contacts being placed between the said cap and base, and each reed having one of its ends secured in the seal between said base plate and cover plate.

4. A multicontact relay comprising a plurality of magnetic reeds sealable to glass, a glass base plate having preformed ridges for spacing and aligning said reed contacts, said preformed ridges having a plurality of indentations thereon, one for each of said magnetic reeds to seat in, said glass base plate having a plurality of grooves in the ends thereof, one individual to each of said magnetic reeds, said magnetic reeds being ar-

ranged side by side in said grooves and indentations and a glass cover plate hermetically sealed to said glass base plate.

5. A relay comprising a glass base plate, a glass cap hermetically sealed to said base plate, and a plurality of magnetic reeds arranged between said cap and base to form a series of switches, each of said switches comprising two magnetic reeds arranged longitudinally with respect to each other, said base plate comprising two parallel ridges perpendicular to the magnetic reeds, said ridges comprising a plurality of indentations, each magnetic reed being seated in one of these indentations, a plurality of grooves in ends of said base plate, a magnetic reed resting in each groove, and magnetic means to actuate said magnetic reeds.

6. A relay comprising a base plate, a cap hermetically sealed to said base plate, and a plurality of magnetic reeds arranged in two rows of parallel reeds between said cap and base, a magnetic reed of each row being associated with a magnetic reed of the other row to form individual switches, said base plate comprising ridges formed therein and a plurality of grooves in the end walls thereof, said ridges having a plurality of indentations therein, said grooves and indentations forming seats for said magnetic reeds, means to seal said cap to said base, and electromagnetic means to cause said switches to make contact.

WALTER E. ELLWOOD

REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
2,187,115	Ellwood et al	Jan. 16, 1940
2,264,746	Ellwood	Dec. 2, 1941
2,289,830	Ellwood	July 14, 1942
2,311,637	Buchanan	Feb. 23, 1943
2,464,990	Plagge	Mar. 22, 1949