Jan. 5, 1932. G. F. DALY 1,839,377

MULTICONTACT RELAY

Filed Aug. 16, 1928

FIG. 1.

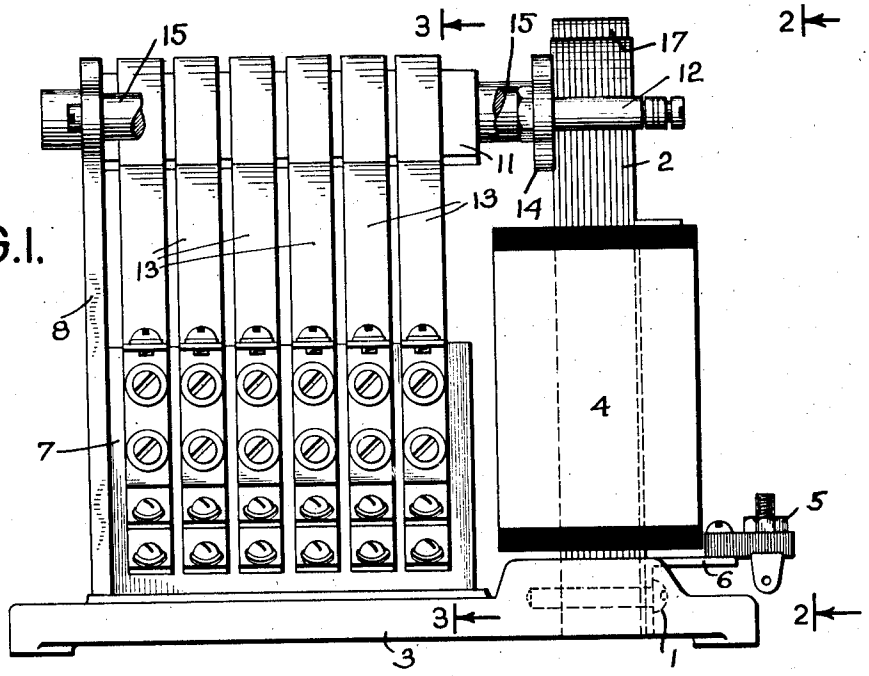


FIG. 2.

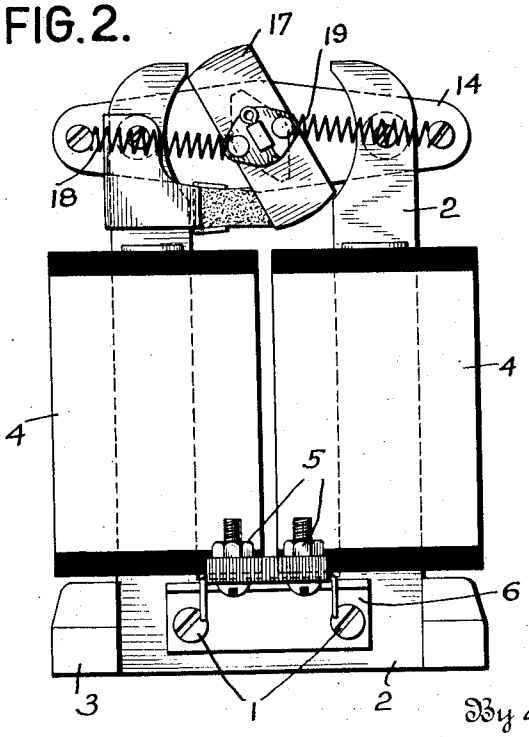
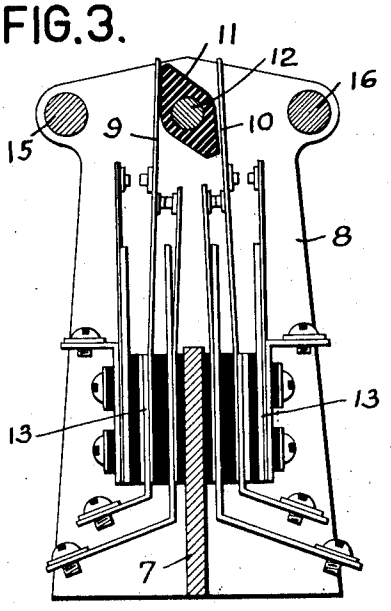


FIG. 3.



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UNITED STATES PATENT OFFICE

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MULTICONTACT RELAY

Application filed August 16, 1928. Serial No. 299,953.

The present invention relates to a multiple contact relay and especially to a relay in which by means of a pendulum armature cooperating with a magnet a plurality of multi-contact sets are operated simultaneously.

The main object of the invention is to provide an improved and efficient relay with a plurality of contact sets for simultaneous operation.

Another object of the invention is to provide cam means arranged on a shaft which is operated by a magnet whereby said cam means cooperates with the contact sets.

Other objects and advantages will be hereinafter set forth in the accompanying specification and claim and shown in the drawings which show by way of illustration what I now consider to be one and a preferred embodiment of the invention.

In the drawings:

Fig. 1 is a side veiw of the contact relay;

Fig. 2 is a front view of the relay;

Fig. 3 is a sectional view on line 3—3 of Fig. 1.

Referring to Fig. 1 on a base plate 3 is mounted a bi-polar laminated magnet core 2 by means of screws 1. On the two arms of the core are located two coils 4, the ends of which lead to the terminal screws 5, fastened on a plate 6 which is attached to the core. The base 3 is provided with a wall 7 and an end plate 8. On both sides of the wall 7 are fastened a plurality of contact sets 13 as may be seen from Figs. 1 and 3. Each contact unit consists of three plate springs arranged so that by moving the middle spring in different directions one current circuit will be opened while at the same time engagement is effected between the middle spring and the other plate spring, thus preparing another current circuit (see Fig. 3). Movement of the middle springs 9 and 10 is effected by a member 11 provided with two cam surfaces which cooperate with the contact springs 9 and 10.

The cam means 11 is fastened on a shaft 12, said cam means and shaft being common to all contact sets 13. Shaft 12 has its bearings in the end plate 8 and in the plate 14, the latter being fastened on the magnet core 2 and connected with end plate 8 by two cross rods 15 and 16. Fixed on the shaft 12 is the armature 17 for the bi-polar magnet core 2. Armature 17 is normally held by means of springs 18 and 19 and by cooperation of cam means 11 with the plurality of plate springs 9 and 10 in a position as shown in Figs. 2 and 3, in which position the spring plates 9 and 10 contacts the coordinated inner spring plates of each contact set.

The operation of the device may easily be understood from the accompanying drawings. When magnets 4 are energized armature 17 will be turned counterclockwise (Fig. 2) into a horizontal position by the magnet core 2. Consequently also cam member 11 will be turned and the two cams will effect switching of all contact sets 13 arranged on both sides of the wall 7 by moving all spring plates 9 and 10 simultaneously. This construction consisting of cams with a rolling armature provides a simple and efficient device and permits a relay of limited current capacity to effect opening and closing of a large number of contacts.

While there has been shown and described and pointed out the fundamental novel features of the invention as applied to a single modification it will be understood that various omissions and substitutions and changes in the form and details of the device illustrated and in its operation may be made by those skilled in the art without departing from the spirit of the invention. It is the intention therefore to be limited only by the scope of the following claim:

In a relay, the combination with a set of contact plates including an outer plate form-

ing with an inner plate a set of normally closed contacts, a diamond shaped cam member having but only one other position from rest and having one of its straight edges coacting with the outer plate for opening the contacts by a movement of less than 90° of the cam member, a pair of magnets having curved pole shoes, an armature having curved pole pieces attracted by the pole shoes to effect the required movement of the cam member, and a pair of oppositely extending springs for centralizing the cam member and placing one of the straight edges of the latter in normal correlation with the outer contact plate and for immediately retracting the cam member from its circuit opening position to its normal position of rest.

In testimony whereof I hereto affix my signature.

GEORGE F. DALY.