Sept. 16, 1952 G. T. BAKER 2,611,012

ARMATURE MOUNTING FOR PLURAL ELECTROMAGNETIC RELAYS

Filed April 25, 1946

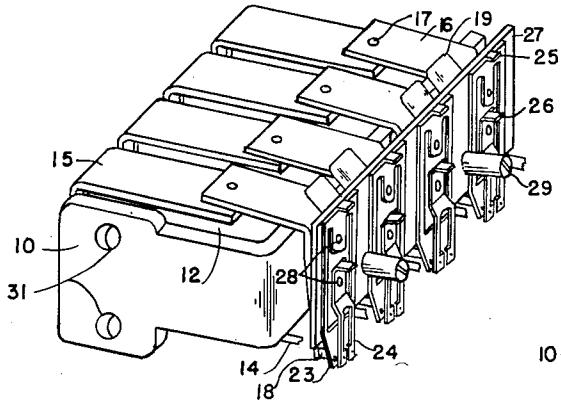


FIG. 1

FIG. 6

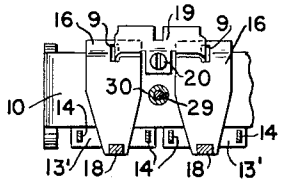


FIG. 2

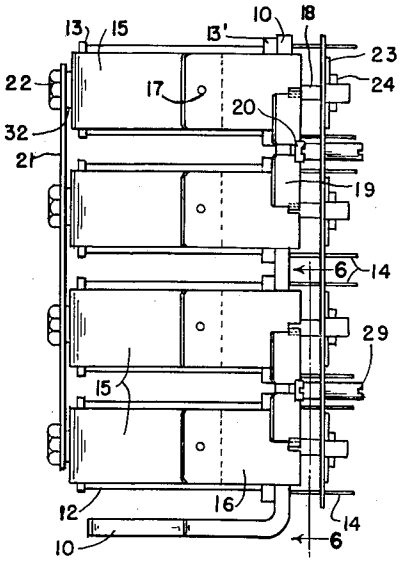


FIG. 3

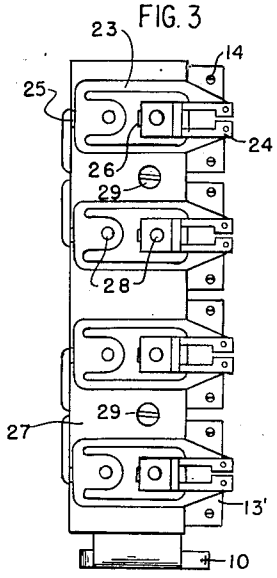


FIG. 4

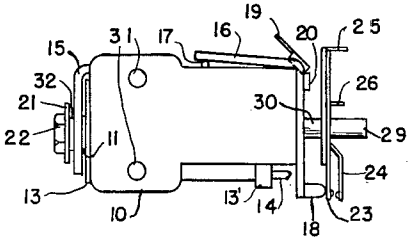
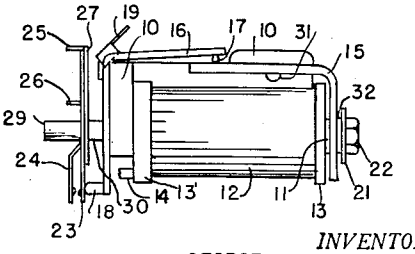


FIG. 5



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ARMATURE MOUNTING FOR PLURAL ELECTROMAGNETIC RELAYS

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In Great Britain May 16, 1945

1 Claim. (Cl. 175—337)

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The present invention relates to electromagnetic relays of the type used in telephone and similar light current electrical signalling systems and is more particularly concerned with so-called multiple relays, that is to say, relays in which a number of operating coils controlling separate sets of contact springs are assembled to form an integral unit having a common support member which may form part of the magnetic circuit. The invention moreover lends itself advantageously to multiple relays of this type which will be of reduced size so that the complete assembly can be mounted in the space which would be occupied by a relay of the type which has been standardised by telephone administrations in various parts of the world. There are various circumstances in which the use of such a multiple relay offers appreciable advantages, for instance, in cases where signals are transmitted in code which requires the use of a plurality of relays, for instance four, to produce the necessary decoding operation and in such cases it is very convenient to have the multiple relay available as a single item.

According to one feature of the invention, in a multiple electromagnetic relay comprising a plurality of movable armatures adapted to be operated independently by separate energising coils mounted on a common support and thereupon to actuate associated contact springs, the individual contact springs are located in a plane at right angles to the axes of the coils.

According to another feature of the invention, in a multiple electromagnetic relay comprising a plurality of movable armatures adapted to be operated independently by separate energising coils mounted on a common support and thereupon to actuate associated contact springs, the contact springs are all mounted on a separate common support member so as to be detachable as a whole.

A further feature of the invention is that in a multiple electromagnetic relay comprising a plurality of movable armatures adapted to be operated independently by separate energising coils mounted on a common support and thereupon to actuate associated contact springs, the coils are secured to the common support at one end and the other ends of two or more coils are linked together by a rigid non-magnetic member.

The invention will be better understood from the following description of a preferred method of carrying it into effect which should be taken in conjunction with the accompanying drawings, comprising Figs. 1 to 6. Of these Fig. 1 is a

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perspective view of the complete assembly in the position in which it would be mounted, Fig. 2 is a plan view, Fig. 3 is a side view, Fig. 4 is an end view from the lower end of Fig. 2, Fig. 5 is an end view from the upper end of Fig. 2, while Fig. 6 is a cross-sectional view along the line 6—6 in Fig. 2.

It will be seen that the multiple relay comprises an L-shaped heelpiece 10 of magnetic material on which are mounted four cores 11 each carrying an operating coil 12. Each coil is wound in the usual manner on a spool with insulating cheeks 13 and 13', cheek 13' carrying soldering tags 14 for the making of the external connections. The end of each core remote from the heelpiece 10 has secured to it an L-shaped member of magnetic material 15 and the magnetic circuit is completed by an L-shaped armature 16 adapted to be mounted on a knife-edge formed on the heelpiece. Each armature 16 is provided with a so-called residual stud 17 to prevent sticking in the operated position and at its opposite end carries an insulating buffer 18 for operating the contact springs. Armature 16 is also provided with a shallow groove 9 on an angle for the reception of a retaining spring 19 which is so formed that a single spring serves for two adjacent armatures and is secured to the heelpiece 10 by the screw 20. In order to secure rigidity of the whole structure and maintain a uniform air-gap, the ends of the cores remote from the heelpiece 10 are linked by a rigid non-magnetic member 21 provided with suitable holes to pass over the ends of the cores 11. Member 21 is secured in position by the nuts 22 which also serve for securing the L-shaped members 15 to their respective cores 11. It may be found desirable to provide a shake-proof washer 32 between the member 21 and each member 15 in order to resist any tendency of the latter to turn when the nuts 22 are tightened up.

Each unit of the assembly is shown with a single pair of contact springs 23 and 24 which are of the twin contact type and are provided with wiring tags 25 and 26 and each of these is secured to the insulating plate 27 by rivets 28. This plate with its associated contacts is held in position by the screws 29 in conjunction with collars 30 and the screws are provided with heads of such size as to form guard posts for protecting the contact springs against damage, for instance from the careless application of a cover.

The contact springs are preferably produced by a stamping operation and by the use of suit-

able jigs the riveting operation may be rendered very simple so that ease of assembly is secured.

It will be appreciated that with this construction the contact springs for all the different units can be removed in a single operation and this makes for simplified maintenance and largely does away with the need for separate adjustment on site.

The whole relay is mounted on a suitable mounting plate by means of screws extending into the holes 31 and it will be understood that it then occupies only the mounting space of a standard relay and retains the important feature that the plane of the contact springs is vertical so that any tendency for dust to settle and produce poor contact is overcome.

According to the invention therefore a very neat and compact construction has been produced whereby a plurality of miniature relays each performing separate functions may be assembled in the space occupied by a relay of standard size and for meeting many of the circuit requirements which are found in practice this construction offers considerable advantages.

I claim:

In a multi-unit relay, two electromagnets having two-ended cores of magnetic material, said magnets being adapted to be energized individually, two individual pole pieces of magnetic material, a common heel piece of magnetic material, a common brace element of non-magnetic material, means for attaching one end of the cores of said magnets to said heel piece, means for attaching said brace element to the other ends of the cores of said magnets to stiffen said assembly of said heel piece and said magnets, said last mentioned means also attaching said pole pieces respectively to said other ends of the cores of said magnets, two armatures of magnetic material, each said armature having a positioning recess, a retaining clip having two members, means for mounting said clip on said heel piece to cause one of said members of said clip to engage said recess of one of said armatures and to cause said other member of said clip to engage said recess of said other armature, said engagements of said members of said clip pivotally positioning and supporting said armatures on said heel piece adjacent respectively to said individual pole pieces with a small air gap between each said armature and its adjacent individual pole piece, the magnetic flux path for one of said armatures being completed by way of a portion of said heel piece, the core of one of said magnets, and one of said individual pole pieces in response to the energization of said one magnet for causing the operation of said one armature, the non-magnetic material of said brace element preventing the inclusion of the core of said other magnet and said other individual pole piece in said path.

GEORGE THOMAS BAKER.

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