

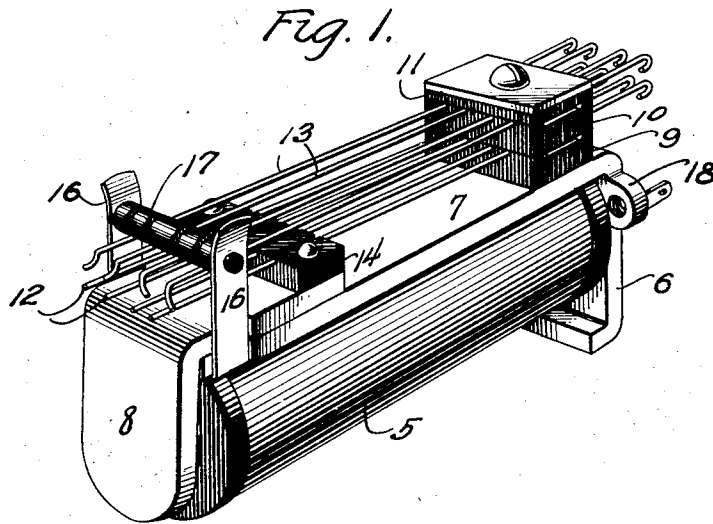
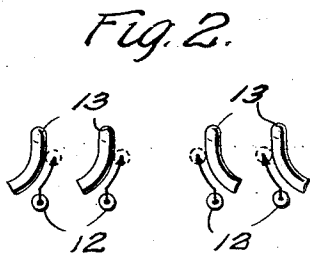
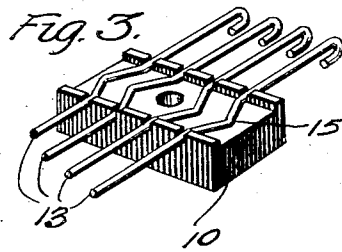
Jan. 6, 1925.

1,521,591

W. O. BECK

ELECTROMAGNETIC DEVICE

Filed June 20, 1921



Inventor:
William O. Beck.
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UNITED STATES PATENT OFFICE.

WILLIAM O. BECK, OF RIDGEFIELD, NEW JERSEY, ASSIGNOR TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ELECTROMAGNETIC DEVICE.

Application filed June 20, 1921. Serial No. 479,065.

To all whom it may concern:

Be it known that I, WILLIAM O. BECK, a citizen of the United States, residing at Ridgefield, in the county of Bergen, State of New Jersey, have invented certain new and useful Improvements in Electromagnetic Devices, of which the following is a full, clear, concise, and exact description.

This invention relates in general to electromagnetic devices and more particularly to a relay especially suitable for telephone and signaling circuits.

In various signaling circuits, particularly those adapted for use in automatic telephony, there is need for closing a large number of separate contacts, and in order that such a system may prove economical it is necessary to provide a relay which is cheap in cost of construction and yet operates efficiently to close the desired contacts. Heretofore, it has been largely the practice to employ relay devices equipped with contact springs of nickel silver, these springs being provided with contact points of platinum or similar material. In view of the large number of contacts often required and the cost of the contact material, the use of a large number of contacts in a circuit becomes burdensome from a cost standpoint, and it is, therefore, the object of the present invention to provide an electromagnetic device in which the individual cost of contacts is small and in which these contacts are so arranged that they will provide satisfactory operation in service and without necessitating a high cost of maintenance.

To attain these objects and in accordance with a feature of the invention, there is provided a device in which the contact springs are of wire construction and the ends are so formed as to provide a wiping contact between pairs of adjacent springs when the armature is operated.

This and other features of the invention will be more clearly understood by referring to the attached drawing in which Fig. 1 is a view in perspective of a relay embodying the features of this invention; Fig. 2 is a view showing the relation of the contact wires to each other; and Fig. 3 is a view of the contact clamping plates, showing the means provided for preventing rotation of the contact wires.

Referring more particularly to Fig. 1, there is disclosed a relay of a well-known

type, having an operating coil 5, heel iron 6, return pole piece 7, and armature 8. The armature 8 is formed at a slightly obtuse angle so that it may be pivoted on the upper edge of pole piece 7. Secured to the rear of pole piece 7 are the insulating blocks 9, 10 and 11, which are of hard rubber or similar insulating material and between which are clamped the lower springs 12, 12 and the upper springs 13, 13. A similar block 14 of hard rubber or other insulating material is also secured to the upper portion of armature 8 and is provided with slots to receive the wires 12, 12, these slots being positioned in accordance with the slots in block 9. As will be seen more clearly by referring to Fig. 3, the wires 12, 12 and 13, 13 are provided with offset or crimped portions 15, adapted to be positioned in horizontal slots in blocks 9 and 10 respectively and thus prevent turning of the spring wires themselves. A U-shaped member, is secured rigidly to the pole piece 7 and between its legs 16, 16 is held a cylindrical insulating member 17, provided with slots in alignment with the slots in blocks 10 and 14. The upper contact springs 13 are tensioned slightly upward so as to be held in position in these slots and under a given tension. The ends of spring wires 13 are formed approximately at right angles, as shown more clearly in Fig. 2, in order to provide a wiping contact with the wires 12 upon operation of the armature. In Fig. 2, which is a view of the contact wires at the point of engagement looking in a line with the axis of the wires, the position of the contact wires 12 in an unoperated position is shown in full line, and the corresponding position of the wires when operated is shown in dotted lines. From this view it will be seen that the contact wires 12 provide a rubbing engagement with the ends of wires 13, and further, that if the wires 13 are bent at an angle slightly greater or less than a right angle, there is also provided a shearing action which results in a wiping action on both sets of wires 12 and 13.

It will also be noted that two of the wires 13 are bent in one direction and the other two in the opposite horizontal direction, thus neutralizing the horizontal thrust that would occur if all wires were formed in the same direction.

The rear ends of the contact wires are hooked as shown, in order to facilitate the soldering of connecting wires, and mounting lugs 18 are provided to permit the device being mounted on a standard mounting plate.

With a relay as described above, the cost of construction of the contact members is extremely low, but nevertheless, due to the wiping action of the individual wires, the contacts between adjacent springs are such as to secure satisfactory operation in service even under severe operating conditions.

What is claimed is:

1. An electromagnetic switching device comprising a plurality of active bare wire contacts, a plurality of passive bare wire contacts having their ends bent to cause a wiping action when engaged by said active wires, a fixed guide member having slots in which said passive wires rest, a movable guide member having slots in which said active wires rest, and means for moving said movable guide member to cause engagement between the active and passive wires.

2. An electromagnetic device comprising an energizing coil, an armature, an active bare wire contact secured at one end, a passive bare wire contact secured at one end and having its opposite end curved to cause a wiping action when engaged by said active wire, a fixed guide member against which said passive contact wire rests, and means controlled by the armature for moving the active wire into engagement with the passive wire.

3. An electromagnetic switching device comprising an energizing coil, a plurality of active contacts, a plurality of passive contacts having their ends fashioned to cause a wiping action when engaged by said active contacts, a fixed guide member having slots for retaining said passive contacts, a movable guide member having slots for retaining said active contacts, and an armature for said electromagnet for moving the active contacts into engagement with the passive contacts.

4. A relay comprising an energizing coil, an armature therefor, a slotted insulating member secured to said armature, a plurality of contact springs positioned under tension in the slots in said insulating member, a plurality of other contact springs each having an offset portion substantially at right angles to its axis adapted to be engaged by said first springs upon operation of the armature and a fixed guiding member against which said second springs are normally tensioned.

5. An electromagnetic switching device comprising a plurality of active bare wire contacts, a plurality of passive bare wire contacts having their ends bent to cause a wiping action when engaged by said active wires, a fixed guide member having slots in which said passive wires rest, and means for moving the active wires into engagement with the passive wires.

In witness whereof I hereunto subscribe my name this 16th day of June, A. D., 1921.

WILLIAM O. BECK.