Oct. 27, 1925. 1,559,305

W. O. BECK

RELAY

Filed March 22, 1924

Fig. 1

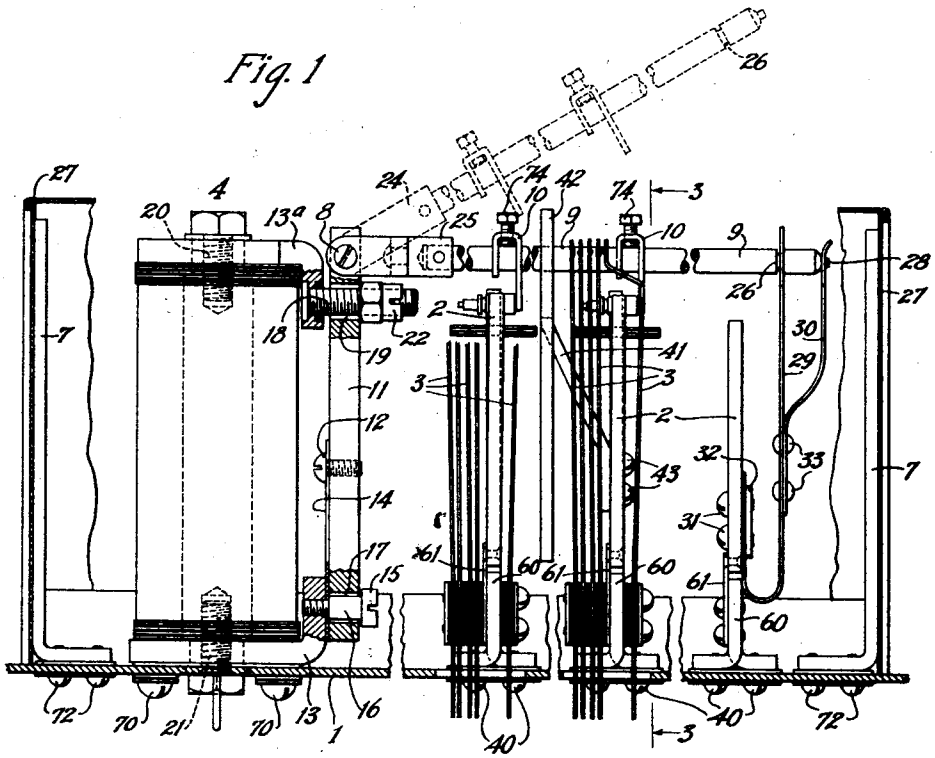


Fig. 3

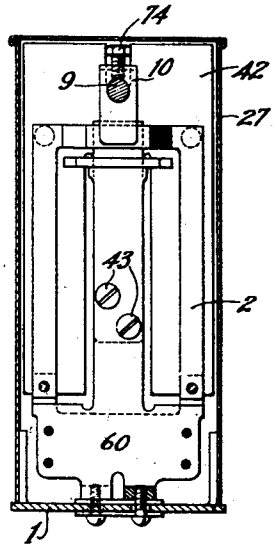
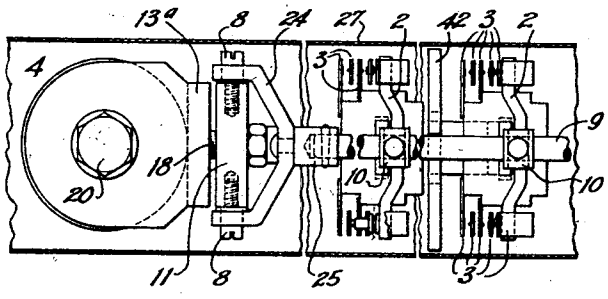


Fig. 2



Inventor:
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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.

RELAY.

Application filed March 22, 1924. Serial No. 701,123.

To all whom it may concern:

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

This invention relates to electromagnetic devices and particularly to what are known as multiple switching relays.

An object of this invention is to provide a relay of this character with certain new and useful improvements, whereby the adjustments, repairs, removal or replacement of the contact spring combinations thereof may be facilitated and made quickly in case of necessity.

Another object is to provide a multiple relay which is durable in construction and economical to manufacture.

Other objects will be apparent from the following specification.

The principal feature of this invention resides in a multiple switching relay comprising a plurality of standard contact spring combinations, which are assembled as separate units, in a similar manner to the relay structure shown and described in U. S. Patent 1,156,671 to E. B. Craft, and a common operating electromagnet therefor mounted on a common mounting plate, wherein adjustable lugs, on a rod pivotally attached to the armature of the electromagnet, control the closure of the contact spring combinations.

A clear understanding of this invention may be had by reference to the accompanying drawing and the following description.

Fig. 1 is a side view of a relay according to the invention showing in dotted line the pivoted rod in a partly raised position.

Fig. 2 is a partial top view of the relay.

Fig. 3 is a sectional view of the relay on line 3—3 of Fig. 1 showing one of the contact spring supports minus the springs.

It will be noted that only two sets of contact springs are illustrated although ordinarily a large number of these sets of springs would be employed, the number depending on the number of switching operations required to be accomplished.

Referring now to the drawings, contact springs 3 and a power unit 4, which in this case is an electromagnet, are mounted on a mounting strip 1 and held by screws 40 and 70 respectively. It will be noted that these contact springs, as shown in combination, are insulated from and fastened to spring supports 60 which also support inverted U shaped contact operating numbers 2 by means of flexible springs 61, as are more clearly shown in the drawings of the before mentioned Patent No. 1,156,671. Different sets of springs may be removed from or added to the relay depending on the number of switching functions to be performed, thereby providing a relay of great flexibility.

In accordance with the number of circuits to be controlled by the operation of the contact springs, a greater or less powerful electromagnet may be employed.

On each end of the mounting strip 1 and fastened thereto by screws 72 are steel punchings 7 which serve as supports for a cover partly shown in section in Figs. 1 and 3, which may be slipped on over the entire relay for protection thereof.

The electromagnet 4 has two pole pieces, the upper one 13^A being fastened against the end of the magnet by the bolt 20 and the lower pole piece 13 by the bolt 21. The armature 11 of the electromagnet 4 is fastened to the lower pole piece by a flexible spring member 14, the upper end of which is secured to the armature by means of two screws 12, only one of which is shown, and the lower end of which is positioned between the armature and pole piece and held securely by two shouldered screws 15, only one of which is shown. It will be noted that the shouldered portion 16 of the screw 15 is substantially smaller than the round aperture 17 of the armature through which the screw passes to permit a pivoting movement of the armature when the electromagnet is energized and operated, as will appear in a later description.

Fastened to the upper pole piece of the electromagnet in a rigid manner and extending through the round aperture 19 of the armature is a shouldered and threaded member 18 provided with a locking nut 22 which is employed for adjusting the gap between the armature 11 and pole piece 13^A,

Fastened to the upper end of the armature by screws 8 is a yoke 24 to which is fastened a collar 25 in which the rod 9 is fastened by a pin. The diameter of the opening in collar 25 for rod 9 may be slightly greater than the diameter of the rod, thus permitting a rotary movement about the pin. The diameter of the rod 9 is uniform throughout its entire length except for the grooved portion 26 and the tip portion 28.

The grooved portion 26 of the rod rests in a slot, not shown, of a spring member 29 which is fastened to the contact operating member 2 by means of screws 31 and clamping plate 32. Fastened to the spring member 29 by rivets 33 is a flexible spring member 30 which is curved at its free end and has a small hole, not shown, into which the tip 28 of the rod is sprung and held in place by the tension of spring 30. This combination, as described, locks the rod in a definite position.

Slidably mounted on the rod 9 are a plurality of lugs 10 provided with set screws 74 which are adapted, when properly adjusted, to engage the upper portion of the contact operating members 2 when the rod 9 is drawn to the left under control of the electromagnet 4.

Spaced at desired intervals throughout the length of the relay (assuming that the relay comprises a number of spring combinations) are guide and support members 42 which are fastened to the members 2 by means of screws 43 which serve the double purpose of guiding and supporting the cover 27 and rod 9.

Assuming that the electromagnet is now energized and operated, the free end of the armature thereof will be attracted towards the pole piece 13A thereby causing a longitudinal movement of the rod 9 which, by means of the lugs 10 mounted thereon, communicates motion to each of the contact operating members 2, thereby causing the contact springs 3 to be operated.

If for any reason the contacts of any spring combinations do not function properly, the associated lugs 10 may be adjusted by loosening the screw 74 and sliding the lug along the rod 9 in the required direction, the screw being tightened when the desired adjustment is secured. If repairs become necessary or if a spring combination should have to be removed, the flexible spring member 30 may be bent to the right far enough to permit the end of the rod 9 to be disengaged therefrom. The rod 9 may then be swung upward out of the way, the screws 8 through the yoke acting as pivot members. This arangement permits free access to the contact spring units.

What is claimed is:

1. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a member attached to and cooperating with the armature of said electromagnet, and a plurality of adjustable lugs on said member for controlling said contact springs.

2. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a member hinged to the armature of said electromagnet, a plurality of members for supporting and guiding said first mentioned member, and a plurality of adjustable lugs on said first mentioned member for actuating said contact springs.

3. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a rod hinged to the armature of said electromagnet, a plurality of slotted supports for holding said rod in its normal position, and a plurality of adjustable lugs on said rod for controlling the closure of said contact springs.

4. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a member hinged to the armature of said electromagnet at one end, the other end of said member engaging supports for holding said member in its operating position, and a plurality of adjustable lugs on said member for controlling the closure of said contact springs.

5. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a rod hinged at one end to the armature of said electromagnet, and a plurality of spring members for cooperating with the other end of said rod, said rod having a plurality of adjustable lugs thereon for controlling said contact springs.

6. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a member hinged at one end to the armature of said electromagnet, a plurality of spring members, said first mentioned member engaging an aperture in one of said spring members at one point and engaging another of said spring members at another point.

7. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a member hinged to the armature of said electromagnet and capable of partial rotation about said hinge, and a plurality of adjustable lugs on said member for controlling said contact springs.

8. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a member hinged to the armature of said electromagnet and capable of partial rotation about said hinge, a plurality of members for supporting and guiding said first mentioned member, and a plurality of adjustable lugs on said first mentioned member for engaging said contact springs.

9. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a rod hinged to the armature of said electromagnet, a plurality of adjustable lugs on said rod for controlling the closure of said contact springs, and a plurality of slotted supports for guiding said rod, said rod being adapted to be rotated about said hinge away from said contact springs.

10. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a rod hinged at one end to the armature of said electromagnet, a plurality of adjustable lugs thereon for engaging said contact springs, and a plurality of spring members for cooperating with the free end of said rod, said rod being capable of disengagement from said spring members and adapted to be moved away from said contact springs about said hinge as an axis.

11. A multiple switching relay comprising a plurality of contact springs, an electromagnet therefor, a member hinged at one end to the armature of said electromagnet, a plurality of spring members, the free end of said first mentioned member fitting into an aperture in one of said spring members and into a slot in another of said spring members, said hinged member being permitted partial rotation away from said contact springs and about said hinge as an axis upon its disengagement from said apertured spring members.

In witness whereof, I hereunto subscribe my name this 19th day of March, A. D. 1924.

WILLIAM O. BECK.