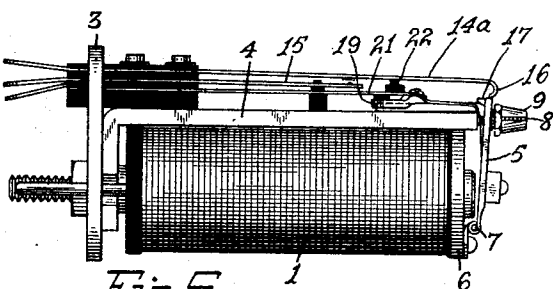
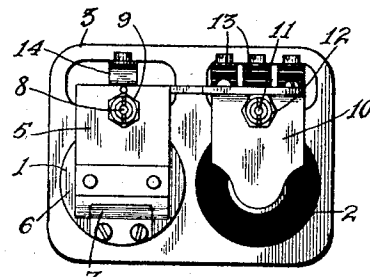
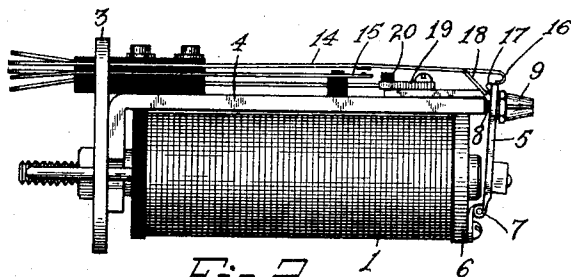
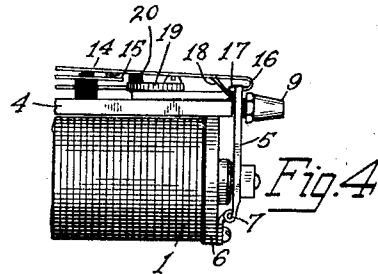
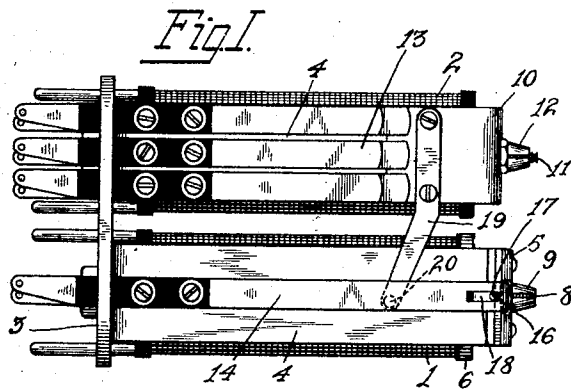


F. SCHOENWOLF.
RELAY.
APPLICATION FILED AUG. 4, 1913.

1,183,405.

Patented May 16, 1916.



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UNITED STATES PATENT OFFICE.

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RELAY.

1,183,405.

Specification of Letters Patent.

Patented May 16, 1916.

Application filed August 4, 1913. Serial No. 782,811.

To all whom it may concern:

Be it known that I, FRED SCHOENWOLF, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Relays, of which the following is a specification.

My invention relates to relays and has for its object the provision of a composite relay structure in which two relays are used, each having an armature. One relay armature is adapted to control a circuit and the other relay armature in addition to controlling other circuits is adapted when actuated to release the aforesaid relay armature. The first aforesaid relay armature when attracted is designed preferably also to lock itself so that it may remain in an actuated position until restored through the agency of the other armature.

My present invention contemplates positive means controlled by the second armature to physically force the first armature into its normal position when the second armature is actuated.

I will explain this and other features of my invention more in detail by referring to the accompanying drawing illustrating the same, in which—

Figure 1 is a top view of a composite relay structure constructed in accordance with my invention; Fig. 2 is a side view thereof; Fig. 3 is an end view thereof; Fig. 4 is a view similar to Fig. 2 showing the parts in an alternative position, and Fig. 5 is a view similar to Fig. 2 of a modified form of the invention.

My improved relay structure comprises a pair of relay coils 1 and 2 fixedly secured to a back plate 3. Each relay coil has an L-shaped section 4 forming part of the magnetic circuit, also fastened to the back plate 3. The relay structure 1 carries an armature 5 pivotally mounted on a metallic end plate 6 provided upon this relay structure through the interposition of a hinge 7. A screw threaded stud 8 carrying a split nut 9 projects from the element 4 and limits the throw of the armature 5, this stud 8 projecting through a hole provided in said armature 5 for this purpose. The other relay structure 2 has an L shaped armature 10, which armature is mounted upon its cooperating magnetic strip 4 and is held in place through the agency of the stud 11 and split

lock nut 12. The armature 10 is adapted to actuate suitable circuit changing springs 13. The relay structure 1 carries two springs 14 and 15 respectively which are insulatingly mounted upon the element 4 as more clearly apparent from Figs. 1 and 2. The spring 14 carries a rounded portion 16 at its extremity which rests on the top surface of the armature 5. Now whenever the armature 5 is attracted the downward pressure of the spring 14 permits this spring to move downwardly after the armature 5 has moved toward the magnet sufficiently to take it away from under the curved extension 16. This downward movement of the armature permits closure of the circuit between the springs 14 and 15 and permits the hooked extension 16 to pass downwardly behind the armature 5 to thereby hold it in this position and thus locking the circuit and preventing the return of the armature 5. The armature 5 has a cam shaped projection 17 which is adapted to cooperate with a finger 18 extending diagonally from the spring 14 and as shown in this illustration punched from a portion of the material of this spring 14. The armature 10 carries an arm 19 which extends under the spring 14 and may then engage this spring through the interposition of an insulating stud 20. Whenever the armature 10 is attracted the arm 19 is raised, to bring it into contact with the spring 14 and raising the spring 14 away from the back of the armature 5 and bringing the finger 18 into engagement with the cam-shaped projection 17. This finger 18 presses against this cam 17 and by sliding along the same forces the armature 5 outwardly against the stop nut 9. When the armature 10 is then restored to its normal position, the spring 14 again moves downwardly until its hooked extension 16 rests on top of the armature 5, and in this position the circuit between the springs 14 and 15 remains open. Now whenever the armature 5 is again attracted the same cycle of operations takes place. It will thus be seen that I have provided means for physically forcing the armature 5 outwardly whenever the armature 10 is attracted in addition to releasing the locking element 16 from behind the element 5.

In Fig. 5, I show a modification in which the spring 14^a is similar to the spring 14 shown in Fig. 2, but is unprovided with the finger 18 and to take the place of this finger

18, I use a separate spring 21, which is forced upwardly by the arm 19, which spring when being forced upwardly engages the cam 17 of the armature 5 to restore this armature at the same time that the spring 14 is forced upwardly through the interposition of the insulating distance piece 22 interposed between the springs 21 and 14^a.

10 I have found that the armature 5 if unprovided with means for restoring it, may not always be restored when the locking element 16 is released because this armature 5 in structures as used in practice has a very delicate adjustment in order to respond to the slight energizations, and may thus be held by residual magnetism or otherwise to prevent its restoration.

From what has been described it will be readily apparent that my invention provides efficient and positive means for restoring the armature 5 whenever the armature 10 has been attracted. The nature of my invention will thus be clear and it will also be apparent that modifications can readily be made without departing from its spirit.

Having however thus described my invention, what I claim as new and desire to secure by Letters Patent is:

30 1. In a composite relay structure the combination with a pair of electromagnets, armatures for said electromagnets, one of them being gravity restored, a latch for holding the gravity restored armature in its attracted position when the corresponding electromagnet is energized, a resiliently supported restoring element for the gravity armature, and means whereby said other armature when attracted releases said latch from the gravity armature and operates said element to effect the positive restoration of the gravity armature.

2. In a composite relay structure the combination with a pair of electromagnets, armatures for said electromagnets, a latch for holding one of said armatures in its attracted position when the corresponding electromagnet is energized, a restoring element for said armature, resilient means supporting said latch and element, and an extension for

said other armature effective when said other armature is attracted to lift said latch from engagement with the armature and operate said element to effect the positive restoration of the released armature.

3. In a composite relay structure the combination with a pair of electromagnets, armatures for said electromagnets, one of them being gravity restored, a contact spring carrying a catch for holding the gravity restored armature in its attracted position when the corresponding electromagnet is energized, a restoring element for the gravity armature, and means operated by said other armature when attracted, to lift said contact spring whereby said latch is disengaged from the locked armature and said element positively restores the released armature.

4. In a composite relay structure the combination with a pair of electromagnets, armatures for said electromagnets, a catch for holding one of said armatures in its attracted position when its electromagnet is energized, a restoring element for said armature, resilient means supporting said catch, and an arm for said other armature effective when said last armature is attracted to remove said catch from engagement with its armature whereby said element positively restores the said first armature.

5. A relay structure of the class described comprising a pair of electromagnets, armatures for said electromagnets one of said armatures being gravity restored, a spring carrying a catch for holding the gravity restored armature in its attracted position when its corresponding electromagnet is energized, a restoring element for the gravity armature, and means operated by said other armature when attracted to raise said spring whereby said catch is disengaged from the locked armature and said element positively restores the released armature.

Signed by me at Chicago, county of Cook, and State of Illinois, in the presence of two witnesses.

FRED SCHOENWOLF.

Witnesses:

G. E. MUELLER,
M. R. ROCHFORD.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."