C. R. H. BUHL.

ELECTRICAL RELAY.

APPLICATION FILED MAY 4, 1910.

1,177,988. Patented Apr. 4, 1916.

Fig. 1.

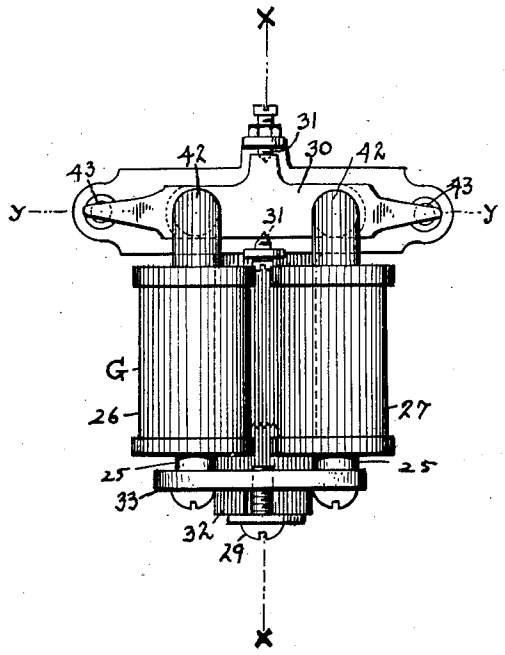


Fig. 2.

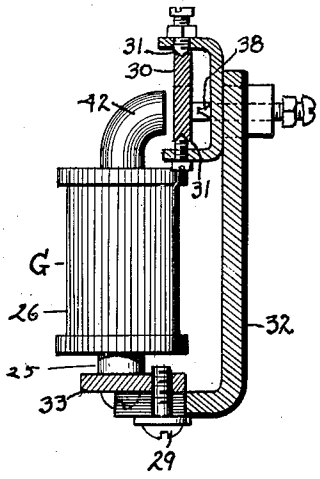
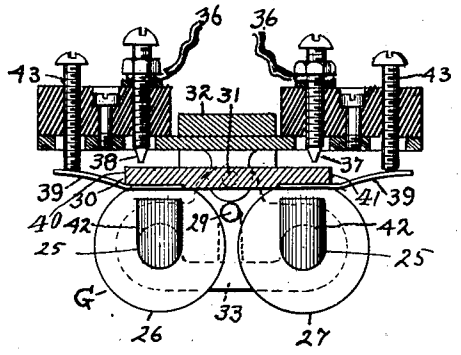


Fig. 3.



ATTEST

E. M. Fisher

H. H. Knapp.

INVENTOR

CARL R. H. BUHL

BY Fisher & Moser

ATTYS.

UNITED STATES PATENT OFFICE.

CARL R. H. BUHL, OF CLEVELAND, OHIO.

ELECTRICAL RELAY.

1,177,988. Specification of Letters Patent. Patented Apr. 4, 1916.

Application filed May 4, 1910. Serial No. 559,387.

To all whom it may concern:

Be it known that I, CARL R. H. BUHL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga, and State of Ohio, have invented certain new and useful improvements in Electrical Relays, of which the following is a specification.

My invention relates to improvements in electrical relays, and the improvement comprises a relay which is susceptible to a reversal of flow of an electric current to produce dual effects, particularly in signaling systems for railways substantially as hereinafter shown and described and more particularly pointed out in the claims.

The general object of my invention will be understood by a description of one of its applications, to wit: in producing different signals in a block signaling system for railways. Thus, with my improvement different signals may be automatically produced in one train at different points along the track to variously indicate danger ahead according to its proximity. Specifically, a green light may be illuminated in the cab of an engine when a train is say two miles in advance thereof, thereby giving a cautionary signal of danger ahead, and a red light may also be illuminated by the same devices when the engine approaches nearer to the danger zone, say one mile nearer. In this system, my device combines with other electrical devices having electrical connections with the rails to bring about a reversal of current by the travel of the train on the tracks; by a break in the electrical circuits, or by an open switch.

In the accompanying drawing, Figure 1 is a front view of my improved relay, and Figs. 2 and 3 are sectional views thereof on lines X—X and Y—Y respectively, of Fig. 1.

The relay comprises a peculiarly constructed electro-magnet having a soft iron core 25 of the usual horse-shoe form with coils 26 and 27 wound upon the same to give the ends of the horse-shoe opposite polarities. These coils are connected in series in a suitable electric circuit in which a reversal of current occurs, and therefore when a reversal of current occurs over said circuit a corresponding reversal is had in the coils. The polarity of the core ends may thus be reversed, and in order to avail myself of this result to operate an armature 30 which is pivotally mounted opposite the ends of the core with its fulcrum or pivot 31 intermediate said ends, I fasten a permanent magnet 32 of bar shape to the cross piece 33 of the core and extend it to a point opposite the core ends. Armature 30 is mounted on this end of permanent magnet bar 32 and manifestly this end and the magnet-bar have the same polarity as one of the core ends. Now as poles of like polarity repel each other, armature 30 will be constantly repelled at one or the other of the poles of the electro-magnet when the current is flowing, dependent upon the direction of the current through the coils, and it also follows that the unlike poles will be attracted accordingly. Briefly, the object is to make armature 30 a permanent south pole and by reversing the flow of the current, change the poles 25 of the magnet as occasion requires so that the resultant north pole will tilt the armature on its pivots either to one side or the other and therethrough cause a flow of the current through either one of two given signal lights or other electrical devices. To this end, the lights or devices are connected by wires leading to contacts 37 and 38 which are adapted to be engaged by the armature in its tilting movements, and whereby the current may be caused to flow through either contact mentioned, but not both. Springs 39 normally hold armature 30 out of engagement with both contacts 37 and 38, and wires 40 and 41 lead from said springs or from armature 30 to the brush and the third rail side of the circuit.

The core ends 42 are bent or curved to one side, and armature 30 is mounted oppositely thereto and has flat spring ends 39 which are engaged by screws 43 to vary and adjust the tension or balance of the armature. Contacts 37 and 38 are also screws, preferably platinum tipped. The permanent magnet bar 32 is slotted at its right angled end and a screw 29 adjustably secures said bar to yoke 33 at said slot to permit armature 30 to be bodily shifted laterally in respect to the core ends 42.

What I claim is:

1. A relay comprising a soft iron core of horse-shoe form and a double coil wound upon the same to provide a reversal of polarity of the core ends, a permanent magnet of bar shape secured to said cores and extending to a point opposite the core ends,

an armature pivotally mounted on said bar magnet, springs on said armature, tension screws engaged by said springs, and separate contacts mounted opposite the ends of said armature and adapted to be engaged thereby.

2. A relay comprising a core and a double coil wound upon the same, a permanent magnet bar having a slotted right-angled end and a screw to adjustably secure said bar to said core, an armature pivotally mounted on said bar opposite the end of the core, contacts for said armature, and springs to hold said armature normally out of engagement with said contacts.

In testimony whereof I affix my signature in presence of two witnesses.

CARL R. H. BUHL.

Witnesses:
E. M. FISHER,
R. B. MOSER.