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PROVISIONAL SPECIFICATION.

Improvements in or Connected with Electric Relays or the Like.

We, **TRIX LIMITED**, of 91, Regent Street, London, W.1, a British Company, and **WERNER ALTMAN**, of 28, Leaside Crescent, London, S.W.1, of German Nationality, do hereby declare the nature of this invention to be as follows:—

This invention relates to electric relays or devices for actuating a rocking member, such as may be used in toy electric railways for actuating points or signals or other purposes in which it is desired to move a rocking member in one of two positions.

The object of the invention is to provide a relay or device in which the rocking member is adapted to be moved in one or the other directions by applying a full or reduced current to the relay.

According to this invention, the relay or device broadly incorporates two electro-magnets, a main armature for actuating the mechanism to be operated rockably positioned so that it can be attracted to one or the other magnets, means for switching either of the magnets in circuit with the source of power, and means, such as an auxiliary armature, for operating the switch, all so arranged and constructed that the main coil magnet is normally in circuit and when the magnet is energised by a reduced current attracts the main armature, and when a full current is applied the switch means is operated to bring the other magnet coil into circuit to attract the main armature in the opposite direction and cut out the main magnet.

The invention can be carried into effect in various ways as to detailed construction, and as one example, the device incorporates two electro-magnets positioned at a suitable distance apart between which is rockably mounted the main armature of somewhat Tee-shape. The yokes of the magnets and

the main armature are so shaped that the free end of the main armature may be attracted to either of the magnets so as to rock the main armature in one or the other direction. The main armature is suitably connected to actuate the mechanism to be controlled or operated.

Adjacent the magnets is an auxiliary armature pivotally mounted intermediate its length and so arranged that one end of the auxiliary armature may be attracted by an auxiliary pole on the yoke of the main magnet. The auxiliary armature carries a contact co-acting with two fixed contacts so arranged that in one position of the auxiliary armature the armature contact engages with one fixed contact and in the other position engages with the other fixed contact.

One circuit is connected from the source of electric power to the auxiliary armature contact; from the first fixed contact through the coil of the main magnet back to the source of power. The other circuit is connected from the second fixed contact through the coil of the second magnet back to the source of power.

The auxiliary armature is so arranged that normally it is positioned so that its contact is in engagement with the first fixed contact and the circuit is through the coil of the main magnet. The main coil is so constructed and arranged that the magnetic power energised in the main coil is sufficient to attract the auxiliary armature only when a full current is applied, the auxiliary armature being adjusted so that it will not operate on a reduced current.

As before stated the auxiliary armature is so positioned that its contact is normally in engagement with the first fixed contact so that on switching on a reduced current to the main magnet, the main magnet is ener-

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gised to attract and rock the main armature in one direction, but owing to the reduced current, the auxiliary armature is not attracted. On applying the full current, the 5 main magnet is sufficiently energised to attract the auxiliary armature and move its contact from the first fixed contact to the second fixed contact and bring into circuit the second magnet which attracts the main 10 armature to rock in the opposite direction, the circuit to the main magnet being broken. Various alterations and modifications may

be made, for instance, instead of the auxiliary armature being actuated by a magnetic circuit formed by an auxiliary pole on the 15 yoke of the main magnet, a separate magnetic coil working in parallel to the main magnet coil may be employed.

Dated this 8th day of February, 1946.

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COMPLETE SPECIFICATION.

Improvements in or Connected with Electric Relays or the Like

We, **TRIX LIMITED**, of 91, Regent Street, 20 London, W.1, a British Company, and **WERNER ALTMAN**, of 28, Leaside Crescent, London, S.W.1, of German Nationality, do hereby declare the nature of this invention and in what manner the same is to be per- 25 formed, to be particularly described and ascertained in and by the following statement:—

This invention relates to electric relays or devices for actuating a rocking member, such 30 as may be used in toy electric railways for actuating points or signals or other purposes in which it is desired to move a rocking member in one or other of two positions.

The object of the invention is to provide 35 a relay or device in which the rocking member is adapted to be moved in one or the other directions by applying a full or reduced current to the relay.

According to this invention, the relay or 40 device broadly incorporates two electromagnets, a main armature for actuating the mechanism to be operated rockably positioned so that it can be attracted to one or the other magnets, means for switching either 45 of the magnets in circuit with the source of power, and means, such as an auxiliary armature, for operating the switch, all so arranged and constructed that the main magnet coil is normally in circuit and when the 50 magnet is energised by a reduced current attracts the main armature, and when a full current is applied the switch means is operated to bring the other magnet coil into circuit to attract the main armature in the 55 opposite direction and cut out the main magnet.

The invention will be clearly understood from the following description aided by the accompanying drawings, in which:—

60 Fig. 1 is a view, more or less diagrammatic, of a relay constructed according to one example of the invention in which the main armature is attracted in one direction, and Fig. 2 is a similar view in which the 65 armature is attracted in the opposite direction.

The invention can be carried into effect in

various ways as to detailed construction. In the example shown on the accompanying drawings the device incorporates two electro- 70 magnets 1, 2 having coils 3, 4 positioned at a suitable distance apart between which is rockably mounted on a pivot 5 the main armature 6 of somewhat Tee-shape. The yokes of the magnets 1, 2 and the main 75 armature 6 are so shaped that the free end of the main armature 6 may be attracted to either of the magnets 1, 2 so as to rock the main armature 6 in one or the other direction. The main armature 6 is suitably con- 80 nected to actuate the mechanism to be controlled or operated.

Adjacent the magnets 1, 2 is an auxiliary armature 7 pivotally mounted on a pivot 8 intermediate its length and so arranged that 85 one end of the auxiliary armature 7 may be attracted by an auxiliary pole 9 on the yoke of the main magnet 1 and the other end by an auxiliary pole 9a on the yoke of the magnet 2. The auxiliary armature 7 carries 90 a contact 10 co-acting with the two fixed contacts 11, 12 so arranged that in one position of the auxiliary armature 7, the armature contact 10 engages with one fixed contact 11 and in the other position engages 95 with the other fixed contact 12.

One circuit is connected from the source of electric power 13 to the auxiliary armature contact 10; from the first fixed contact 11 through the coil 3 of the main magnet 1 100 back to the source of power 13. The other circuit is connected from the second fixed contact 12 through the coil 4 of the second magnet 2 back to the source of power 13.

The auxiliary armature 7 is so arranged 105 that normally, under tension of a spring 14, it is positioned so that its contact 10 is in engagement with the first fixed contact 11 (as shown in Fig. 2) and the circuit is through the coil 3 of the main magnet 1. The main 110 coil 3 is so constructed and arranged that the magnetic power energised in the main coil 3 is sufficient to attract the auxiliary armature 7 only when a full current is applied, the auxiliary armature 7 being ad- 115 justed by the spring 14 so that it will not

operate on a reduced current.

As before stated the auxiliary armature 7 is so positioned that its contact 10 is normally in engagement with the first fixed contact 11 so that on switching on a reduced current to the main magnet 1, the main magnet 1 is energised to attract and rock the main armature 6 in one direction, but owing to the reduced current, the auxiliary armature 7 is not attracted. On applying the full current, the main magnet 1 is sufficiently energised to attract the auxiliary armature 7 and move its contact 10 from the first fixed contact 11 to the second fixed contact 12, as shown in Fig. 1, and bring into circuit the second magnet 2 which attracts the main armature 6 to rock in the opposite direction, the circuit to the main magnet 1 being broken. The auxiliary pole 9a keeps the auxiliary armature 7 in the attracted position until the circuit through the coil 4 is broken when the auxiliary armature 7 will be restored to its original position by the spring 14.

Various alterations and modifications may be made, for instance, instead of the auxiliary armature 7 being actuated by a magnetic circuit formed by an auxiliary pole 9 on the yoke of the main magnet 1, a separate magnetic coil working in parallel with the main magnet may be employed.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. An electric relay or device for actuating a rocking member incorporating two electro-magnets, a main armature for actuating the mechanism to be operated rockably

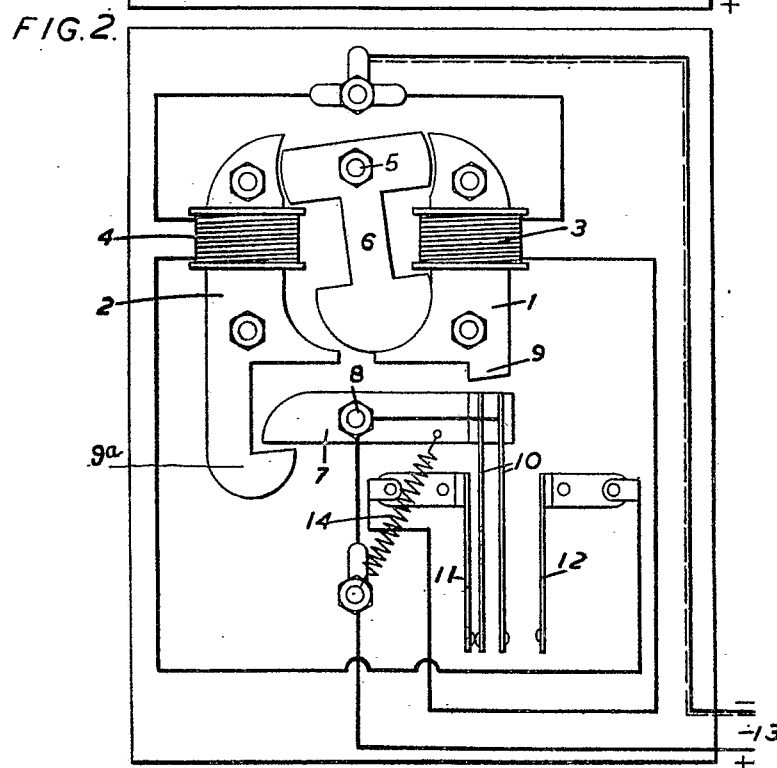
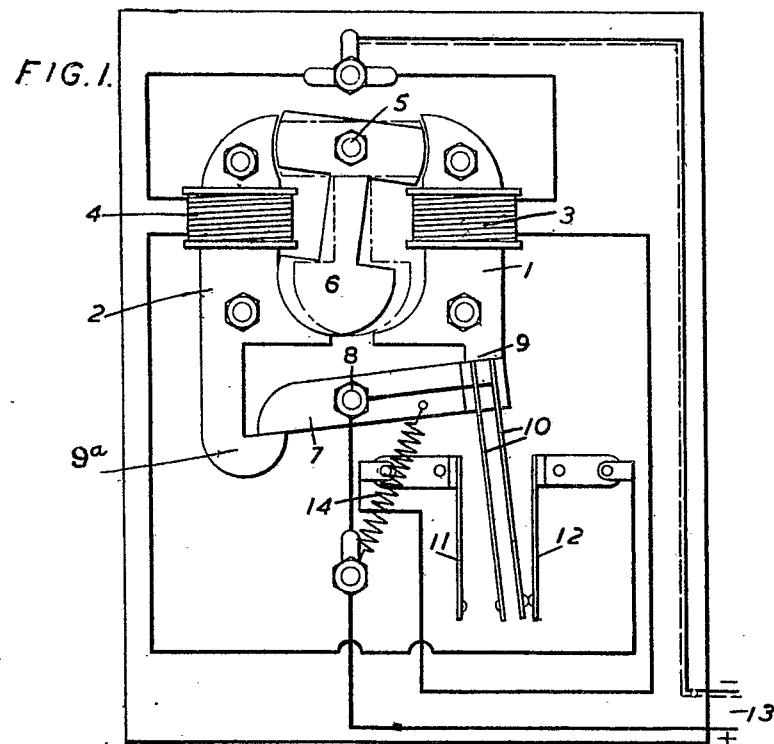
positioned so that it can be attracted to one or the other magnet, means for switching either of the magnets in circuit with the source of electric power, and means, such as an auxiliary armature, for operating the switch, all so arranged and constructed that the main magnet coil is normally in circuit and when the magnet is energised by a reduced current attracts the main armature, and when a full current is applied, the switch means is operated to bring the other magnet into circuit to attract the main armature in the opposite direction and cut out the main magnet.

2. An electric relay or device for actuating a rocking member comprising two electro-magnets positioned at a suitable distance apart, a main armature for actuating the mechanism to be operated rockably mounted between the yokes of the magnets, a spring tensioned auxiliary armature pivotally mounted so that one end may be attracted by an auxiliary pole on the yoke of the main magnet and the other end by an auxiliary pole on the yoke of the second magnet, a contact on said auxiliary armature, and two fixed contacts so positioned that on rocking the auxiliary armature its contact can make contact with either of the fixed contacts, substantially as set forth.

3. An electric relay constructed substantially as described with reference to the accompanying drawings.

Dated this 7th day of March, 1947.

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[This Drawing is a reproduction of the Original on a reduced scale.]