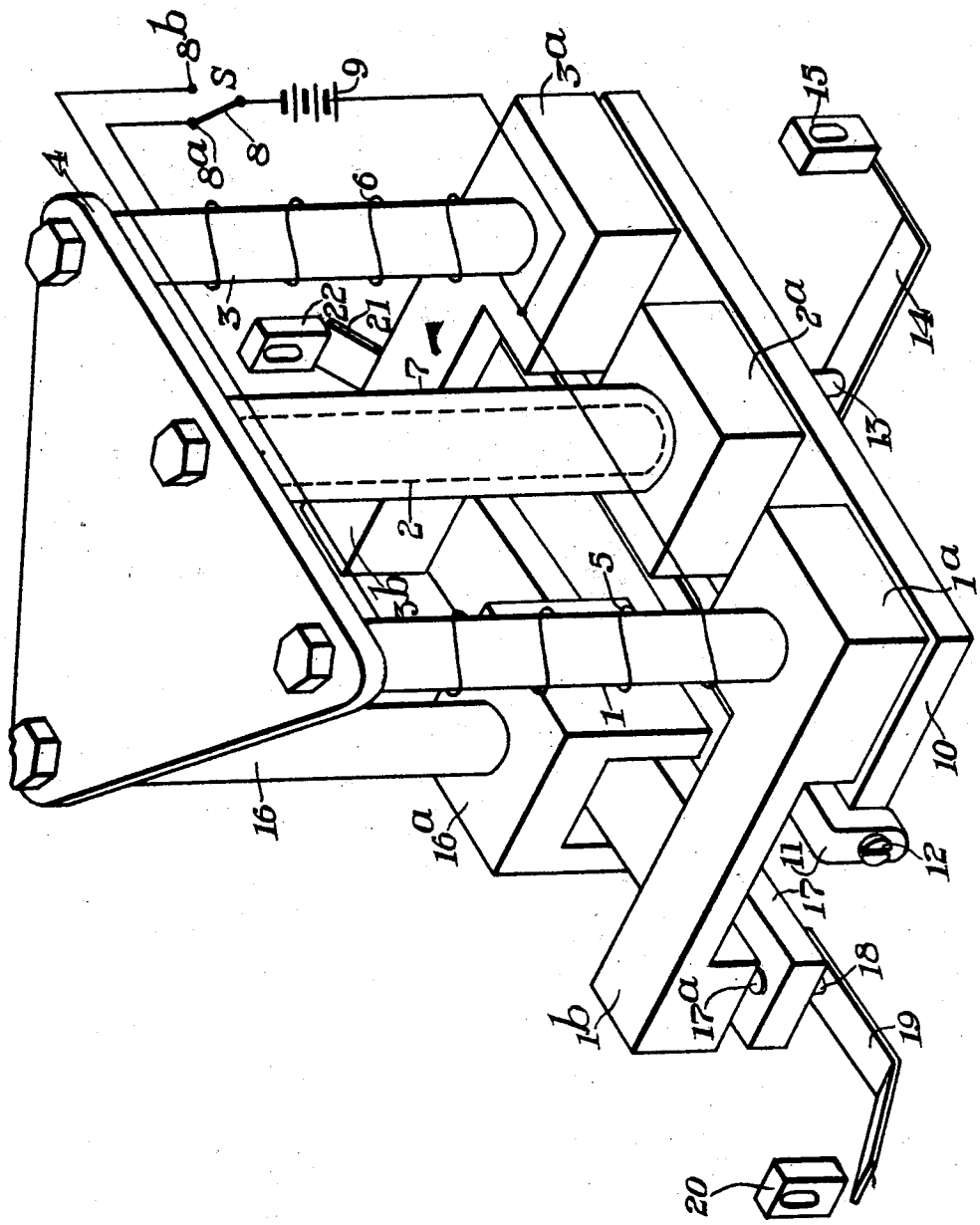
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ELECTRICAL RELAY

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ELECTRICAL RELAY

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My invention relates to electrical relays.

I will describe one form of electrical relay embodying my invention, and will then point out the novel features thereof in claims.

The accompanying drawing is a view, partly diagrammatic, and partly in isometric projection, illustrating one form of relay embodying my invention.

Referring to the drawing, the relay comprises three parallel magnetizable cores 1, 2 and 3, connected together at their upper ends by a back strap 4, and provided at their lower ends with enlarged pole pieces 1^a, 2^a and 3^a, respectively. The cores 1 and 3 carry energizing windings 5 and 6, respectively, while the core 2 carries a sleeve 7 of electrical conducting material such as copper. A neutral magnetizable armature 10 is pivotally supported for swinging motion towards or away from the pole pieces 1^a, 2^a and 3^a, by means of pivot screws 12 carried in a non-magnetizable bracket 11 fastened to the sides of the pole pieces 1^a, 2^a and 3^a, only one pivot screw 12 being visible in the drawing. Attached to the underside of the armature 10 by means of an insulating stud 13 is a contact finger 14, which engages a fixed contact 15 to close a contact 14—15 when armature 10 is closed.

The relay also comprises a constantly magnetized fourth core 16 which extends parallel to the cores 1, 2 and 3. As here shown, the core 16 is a permanent magnet, the upper end of which is fastened to the back strap 4, and the lower end of which is provided with a bifurcated pole piece 16^a. Pivoted at its center between the bifurcations of the pole piece 16^a is a polarized armature 17. The pole pieces 1^a and 3^a are provided with integral extensions 1^b and 3^b, respectively, the pole faces of which overlie the opposite ends of the polarized armature 17. The armature 17 is arranged to swing toward one or the other of these extensions but is prevented from actually touching these extensions by means of non-magnetizable stops 17^a attached to the armature 17, only one of which is shown. The armature 17 carries two contact fingers 19 and 21, which are fastened to the armature by means of insulating studs 18. When armature 17 is swung toward the extension 3^b as shown in the drawing, the contact finger 21 engages a fixed contact 22 to close a contact 21—22, but when the armature 17 is swung toward the extension 1^b, the contact 21—22 is opened and contact finger 19 then engages a fixed contact 20 to close a contact 19—20.

Current may be supplied to winding 5 or winding 6 from a suitable source such as a battery 9 over the contacts 8—8^b or 8—8^a, respectively, of a manually operable switch S. The windings 5 and 6 are so arranged that when current is supplied to winding 5, the relative polarity of the pole piece 1^a with respect to the pole piece 2^a will be the same as the relative polarity of the pole piece 3^a with respect to the pole piece 2^a when current is supplied to winding 6. It will be apparent, therefore, that the flux set up in core 2 by current in either of these windings will pass through core 2 in the same direction.

In explaining the operation of the apparatus, I will assume that core 16 is magnetized in such manner that the upper end of this core is a south magnetic pole and the lower end of this core is a north magnetic pole. Both ends of armature 17 are therefore north magnetic poles. If winding 6 is energized, as shown in the drawing, pole piece 3^a becomes a south magnetic pole, and pole pieces 2^a and 1^a become north magnetic poles. Neutral armature 10 therefore picks up and closes contact 14—15, and polarized armature 17 swings towards extension 3^b of pole piece 3^a and closes contact 21—22. If winding 5 is energized, however, as when contact 8—8^b of switch S is closed, pole piece 1^a becomes a south magnetic pole and pole pieces 2^a and 3^a become north magnetic poles. Under these conditions, armature 10 again picks up to close contact 14—15, but polarized armature 17 now swings toward extension 1^b of pole piece 1^a to open contact 21—22 and close contact 19—20. When windings 5 and 6 are both de-energized, armature 10 drops, thereby opening contact 14—15.

It will be noted that due to the position of core 2 with respect to cores 1 and 3, whenever winding 5 or winding 6 is energized, a greater number of flux lines pass through this core

than through the core associated with the de-energized winding. As previously pointed out, core 2 carries a sleeve 7 of electrically conducting material, and since the greater number of flux lines thread this core, when the supply of current to an energized winding is interrupted, the decay of the magnetic flux set up by such energized winding is delayed, so that armature 10 is rendered slow releasing. Since the direction of flux through core 2 is the same regardless of whether winding 5 or winding 6 is energized, it follows that if one winding is energized immediately after the other winding is de-energized, the polarized armature 17 will be reversed, but the neutral armature will remain closed. It will be apparent, therefore, that I have provided a relay in which the polarized armature may be reversed without releasing the neutral armature.

Although I have herein shown and described only one form of relay embodying my invention, it is understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim is:

1. A relay comprising a first, a second, and a third magnetizable core connected together at one end by a back strap and each provided at the other end with a pole piece; a first winding on said first core and a second winding on said second core, means for supplying current to one or the other of said windings in such manner that the flux set up by current in either of said windings always threads said third core in the same direction, an armature movable toward said pole pieces when either of said windings is energized, and means for delaying the decay of flux when either of said windings become de-energized to delay the movement of said armature away from said pole pieces.

2. A relay comprising a first, a second, and a third magnetizable core connected together at one end by a back strap and each provided at the other end with a pole piece; a first winding on said first core and a second winding on said second core, means for supplying current to one or the other of said windings in such manner that the flux set up by current in either of said windings always threads said third core in the same direction, an armature movable toward said pole pieces when either of said windings is energized, and a sleeve of electrical conducting material on said third core for delaying the decay of flux in said third core when either of said windings become de-energized to delay the movement of said armature away from said pole pieces.

3. A relay comprising a first, a second, and a third magnetizable core connected together at one end by a back strap and each provided at the other end with a pole piece; a first winding on said first core and a second winding on said second core, means for energizing one or the other of said windings in such manner that the flux set up by current in either of said windings threads said third core in the same direction, a polarized armature movable to a first or a second position according as said first or said second winding is energized, a neutral armature movable toward said pole pieces when either of said windings is energized, and means associated with said third core for delaying the decay of flux in said third core when either of said windings becomes de-energized to delay the movement of said neutral armature away from said pole pieces.

4. A relay comprising a first, a second, and a third magnetizable core connected together at one end by a back strap and each provided at the other end with a pole piece; a first winding on said first core and a second winding on said second core, means for energizing one or the other of said windings in such manner that the flux set up by current in either of said windings threads said third core in the same direction, a polarized armature movable to a first or a second position according as said first or said second winding is energized, a neutral armature movable toward said pole pieces when either of said windings is energized, and a sleeve of electrical conducting material on said third core for delaying the decay of flux in said third core when either of said windings becomes de-energized to delay the movement of said neutral armature away from said pole pieces.

5. A relay comprising a first, a second, and a third magnetizable core connected together at one end by a back strap and each provided at the other end with a pole piece, a first winding on said first core and a second winding on said second core, means for energizing one or the other of said windings in such manner that the flux set up by either of said windings threads said third core in the same direction, a polarized armature movable to a first or a second position according as said first or said second winding is energized, a neutral armature movable toward said pole pieces when either of said windings is energized, and a copper sleeve on said third core for delaying the decay of flux in said third core when either of said windings becomes de-energized to delay the movement of said neutral armature away from said pole pieces.

6. A relay comprising a first, a second, and a third parallel core connected together at one end by a back strap and each provided at the other end with an enlarged pole piece; a first winding on said first core and a second winding on said second core, means for supplying current to one or the other of said windings in such manner that the flux set

up by current in either of said windings threads said third core in the same direction, a neutral armature arranged to swing toward said pole pieces when either of said windings is energized, a first integral extension on the pole piece of said first core, a second integral extension on the pole piece of said second core, a polarized armature arranged to swing toward said first or said second extension according as said first or said second winding is energized, means associated with said third core for delaying the decay of flux in said third core to prevent said neutral armature from opening if one of said windings is energized immediately after the winding which caused said neutral armature to swing toward the pole pieces becomes de-energized, and contacts controlled by both said armatures, respectively.

7. A relay comprising a first, a second, and a third parallel magnetizable core connected together at one end by a back strap and provided at the other end with a first, a second, and a third enlarged pole piece respectively; a first winding on said first core and a second winding on said second core, means for supplying current to said first or said second windings in such manner that the flux set up in said first or said second core threads said third core in the same direction, a sleeve of electrical conducting material on said third core for delaying the decay of flux in said third core; a neutral armature arranged to swing toward said pole pieces when one of said windings is energized; a first and second integral extension on said first and second pole pieces respectively, a constantly magnetized core engaging said back strap at one end and provided at the other end with a bifurcated pole piece located between said extensions, a polarized armature pivoted at its center between the bifurcations of said bifurcated pole piece and arranged to swing toward said first or said second extensions according as said first or said second winding is energized, and two contacts one controlled by each said armature.

8. A relay comprising a first and second parallel cores connected at their upper ends by a back strap and each provided at their lower ends with an enlarged pole piece, a third magnetizable core located between said first and second cores and connected at its upper end with said back strap and provided at its lower end with a third enlarged pole piece, a first winding on said first core and a second winding on said second core, means for energizing said first or said second winding in such manner that the flux set up by either of said windings threads said third core in the same direction, a neutral armature pivoted to swing toward said pole pieces when either of said windings is energized, a first and second integral extensions on said first and second cores respectively, a constantly magnetized core having one end engaging said back strap and having the other end located between said first and second extensions, a polarized armature pivoted intermediate its ends on such other end of said constantly magnetized core and arranged to swing toward said first or said second extension according as said first or said second winding is energized, contacts controlled by said armatures, respectively, and a sleeve of conducting material on said third core for delaying the decay of flux in said third core to prevent said neutral armature from opening if one of said windings is energized immediately after the other winding is de-energized.

9. A relay comprising a first, a second, and a third core connected together at one end by a back strap and each provided at the other end with a pole piece; a first winding on said first core and a second winding on said second core, means for supplying current to one or the other of said windings in such manner that the flux set up by current in either of said windings always threads said third core in the same direction, an armature movable toward said pole pieces when either of said windings is energized, and means for delaying the decay of flux when one of said windings becomes de-energized to delay the movement of said armature away from said pole pieces.

10. A relay comprising a first, a second, and a third core connected together at one end by a back strap and each provided at the other end with a pole piece; a first winding on said first core and a second winding on said second core, means for supplying current to one or the other of said windings in such manner that the flux set up by current in either of said windings always threads said third core in the same direction, a polarized armature movable to a first or a second position according as said first or said second winding is energized, a neutral armature movable toward said pole pieces when either of said windings is energized, and means for delaying the decay of flux when one of said windings becomes de-energized to delay the movement of said neutral armature away from said pole pieces.

11. A relay comprising a first, a second, and a third core connected together at one end by a back strap and each provided at the other end with a pole piece; a first winding on said first core and a second winding on said second core, means for supplying current to one or the other of said windings in such manner that the flux set up by current in either of said windings always threads said third core in the same direction, a polarized armature movable to a first or a second position according as said first or said second winding is energized, a neutral arma-

ture movable toward said pole pieces when either of said windings is energized, and means for delaying the decay of flux when one of said windings becomes de-energized to such an extent that if the other winding is immediately energized said neutral armature will remain closed.

In testimony whereof I affix my signature.

BRANKO LAZICH.