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POLARIZED RELAYS
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Fig. 1

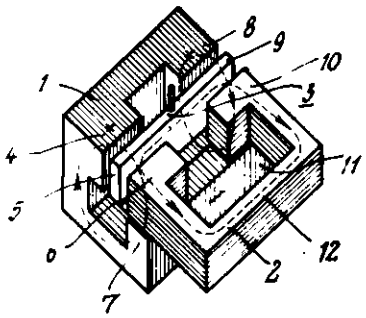


Fig. 2

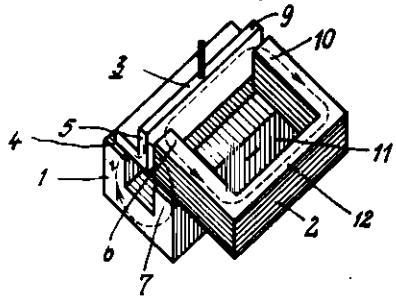
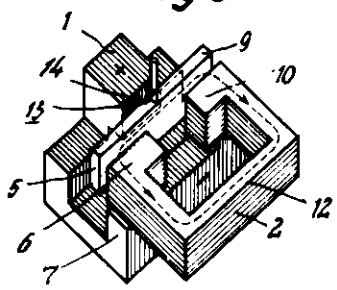


Fig. 3



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ALIEN PROPERTY CUSTODIAN

POLARIZED RELAYS

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This invention relates to improvements in polarized relays.

A polarized relay with divided permanent magnetic flux is well known in which the two permanent fluxes form a closed circuit through the ends of the armature, whereas the variable alternating flux passes transversely through the armature.

The known polarized relay presents the disadvantage in that a relatively large armature must be employed which is generally constantly saturated owing to the magnetic direct-current flux which forms a closed circuit through the ends of the armature. If the saturation of the armature should not be effected too rapidly, the cross-section of the armature must be made larger. However, this does not mean an increase in weight which cannot be put up with, particularly when designing a sensitive relay.

This drawback is removed according to the invention and a polarized relay is provided whose armature and therefore its cross-section is extremely small, since in this instance the polarizing permanent flux does not pass through the armature. According to the invention the permanent magnetic fluxes traverse in spaced relation from one another the armature ends in the transverse direction, whereas the alternating magnetic flux forms substantially a circuit through the ends of the armature.

It is of particular advantage to maintain two of the four air gaps constant. This may be accomplished by giving the armature a particular form, preferably by giving it an L-shaped cross-section.

In the accompanying drawings are shown three forms of the invention in diagrammatic form.

Fig. 1 shows the permanent magnet 1, the alternating flux core 2 and the armature 3. The permanent magnet is so shaped that the two permanent fluxes form a closed circuit through the ends of the armature 3. The flux circuit extends from the pole piece 4 of the permanent magnet 1 through the end 5 of the armature 3 to the pole piece 6 of the alternating-current core. The pole shoe 6 is arranged on the pole shoe 7 of the permanent magnet. The dotted circle and the arrow indicate the manner and direction of flow. The second permanent flux circuit extends from the pole piece 8 of the permanent magnet 1 through the other end 9 of the armature 3, the pole piece 10 of the alternating-flux core to the pole piece 11 of the permanent magnet 1. The permanent fluxes are therefore in spaced relation from one another and pass the ends of the armature in the transverse direction.

If the alternating flux core 2 is energized in a given direction by a coil (not shown) arranged on the limb 12, the flux circuit of the alternating flux core 2 extends from the pole piece 6 through the entire length of the armature to the pole piece 10 of the alternating flux core.

Fig. 2, in which the same reference characters denote corresponding parts of Fig. 1, shows an arrangement corresponding to that of Fig. 1 except that the flux supply air gaps (i. e., the air gaps through which the permanent fluxes enter the armature) remain constant despite the movement of the armature. This may be accomplished by giving the armature a predetermined shape, i. e., by designing the armature in this embodiment as an armature having an L-cross-section. Upon the movement of the armature only the working air gaps (i. e., the air gaps through which the alternating flux enters and leaves the armature) are varied.

A further advantage of the above-described embodiment consists in designing both the permanent magnet 1 and the alternating-flux core 2 of one piece, since both need only be given a U-shaped cross-section.

Fig. 3 shows another embodiment of the invention. In contradistinction to the above-described embodiments the permanent flux in this embodiment enters the armature at the pivot as indicated at 13 so that the permanent flux passes from the north pole designated by + through the air gap 14 into the armature 3 and divides itself at the armature pivot 13. The flux circuit extends on the one hand as indicated by the arrows from the armature pivot 13 to the end 5 of the armature through the air gap, the pole shoe of the alternating-flux circuit to the south pole 7 of the permanent magnet and on the other hand through the pivot 13, the other end 9 of the armature, the air gap, the pole piece 10 to the south pole of the permanent magnet. The alternating-flux circuit extends in the same manner as in the embodiment described above.

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