Oct. 17, 1950 J. L. BONANNO 2,526,455

RELAY

Filed Aug. 30, 1947

Fig. 4.

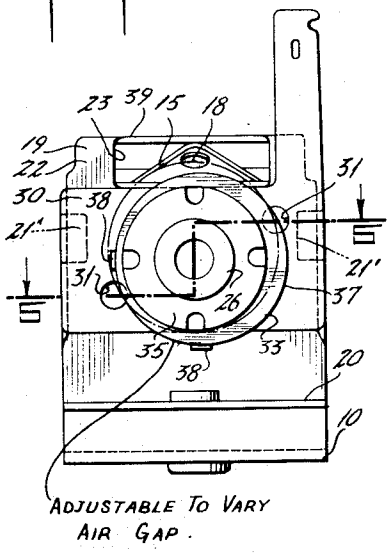


Fig. 1.

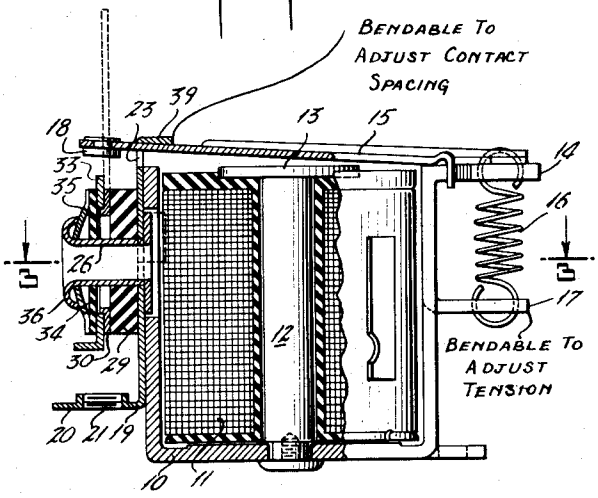


Fig. 2.

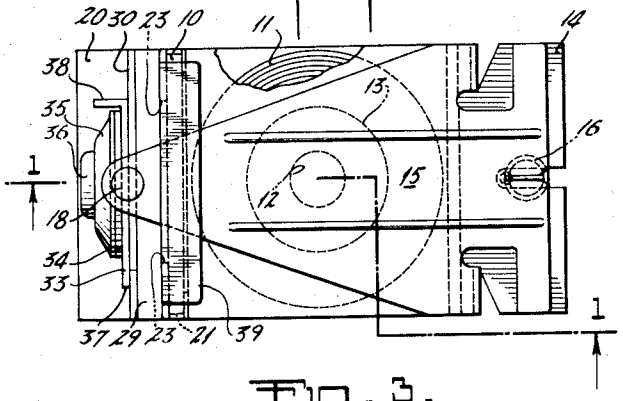


Fig. 5.

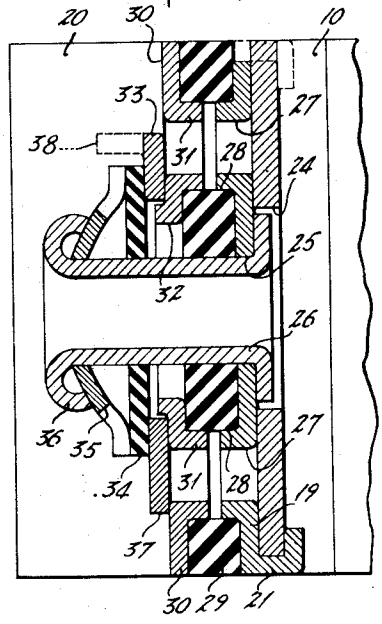
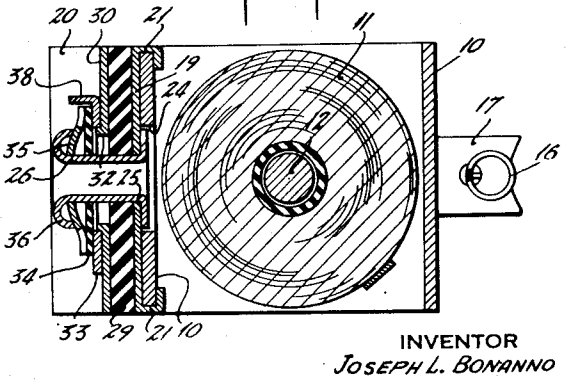


Fig. 3.



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Patented Oct. 17, 1950

2,526,455

UNITED STATES PATENT OFFICE

2,526,455

RELAY

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Application August 30, 1947, Serial No. 771,449

3 Claims. (Cl. 200—87)

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The present invention relates to relays and is more particularly directed toward relays having a small input such as obtainable from the rectification of radio frequency currents and capable of controlling the load circuits of toy railroad accessories and other similar current consuming devices.

The energy available may be of the order of 6 milliwatts while the load to be controlled may be at least as high as 4 amperes at 18 volts.

The present invention contemplates relays for these purposes characterized in having a compact design in which it is possible to effect adjustments to vary the air gap by means of a normally insulated contact adjustable to vary the travel of the armature toward closed position. This adjustment preferably takes the form of an eccentrically mounted disc whose periphery forms the fixed contact.

Other objects of the invention are to provide a design wherein the spacing of the contacts and the tension of the armature spring may be readily varied.

The relay herein shown and claimed is intended for use with electronic receivers and tuning assemblies, such as shown and described in my application for patent Serial No. 771,447, filed August 30, 1947.

The accompanying drawings show, for purposes of illustrating the present invention, an embodiment in which the invention may take form, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In these drawings:

Figure 1 is an elevational view of the relay with parts in section along the line 1—1 of Figure 2;

Figure 2 is a top plan view of the relay;

Figure 3 is a transverse section on the line 3—3 of Figure 1;

Figure 4 is an elevational view taken from the left of Figure 1; and

Figure 5 is a sectional view on the broken line 5—5 of Figure 4.

The relay has a U-shaped magnetic frame 10, coil 11, core 12 with pole piece 13 which projects above the end of the coil. The frame 10 has an anchorage lug 14 on which is pivoted an armature 15. The armature is biased in a counter-clockwise direction by a spring 16 anchored or secured to a lug 17, bent out of the frame. The armature 15 carries the movable contact 18 at its extreme end.

The side of the magnetic frame opposite the pivotal mounting of the armature carries a sheet

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metal stamping 19, which has a mounting bracket 20 threaded as indicated at 21 to facilitate securing the relay frame in place. The stamping 19 has lugs 21'—21', folded about the side of the frame 10 to secure it in place and has an upper extension 22 slotted, as indicated at 23, to receive the armature. The frame 10 and stamping 19 are apertured as indicated at 24 and 25, respectively, to receive a hollow rivet 26.

Stamping 19 has extruded bosses 27—27 which enter holes 28—28 in an insulating disc 29. A contact strip 30 has similar extrusions 31—31 to enter the holes 28 so that the contact strip may be held against rotation relative to the relay structure. The contact strip 30 has the central extrusion 32 of larger diameter than tubular rivet 26, and this extrusion forms a bearing for a contact disc 33. An insulating washer 34 is pressed against the disc 33 by a spring 35, held under tension by upset portion 36 of rivet 26.

A contact disc 33, preferably made of palladium silver, is mounted opposite the movable contact 18. The periphery of disc 37 is eccentric with respect to the axis of the rivet. It has lugs 38—38 to facilitate adjusting it about this axis. The distance which the movable contact must travel to reach the edge of the disc can be varied by adjusting the disc angularly so that it is possible to vary the length of the air gap between the pole piece 13 and the armature when the circuit is closed. A suitable air gap is 0.002" to 0.004". The palladium silver contact is non-welding and has long life at the current densities above referred to. To facilitate adjusting the open position of the armature contact, the upper end of the armature guide stamping 19 is arranged to be bent over as indicated at 39. The travel of the movable contact may be adjusted to 0.010" to 0.015".

The tension of spring 17 may be adjusted by bending the lug 17 to vary the voltage at which the relay closes the current. A suitable tension is such that the restoring force at the relay contact is from 1.5 to 2 grams in the particular relay referred to.

Since it is obvious that the invention may be embodied in other forms and constructions within the scope of the claims, I wish it to be understood that the particular form shown is but one of these forms, and various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

What is claimed is:

1. A relay comprising a U-shaped magnet frame, a core carried by the frame and having

a pole piece, a coil about the core, a rigid armature fixedly pivoted to one side of the frame in magnetic contact therewith and extending across the face of the pole piece and close to the other side of the frame, a contact fixedly carried by the free end of the armature and extending beyond said other side of the frame, a spring biasing the armature away from the pole piece, a side plate secured to the outside face of the side of the magnet frame remote from the armature pivot and carrying a stop element against which the spring holds the armature when the coil is deenergized, an outwardly projecting stud carried by the magnet frame, terminal means insulatedly and non-rotatably supported about the stud, a conducting disc bearing on the terminal means and rotatable about the stud, the disc having an eccentric peripheral edge engageable with the contact on the armature to connect the armature and frame to the insulated terminal means and vary the air gap between the pole piece and armature when the contacts are in engagement.

2. A relay such as claimed in claim 1, wherein

the stud has an upset outer end, and having an insulating washer bearing on the face of the disc and a spring washer between the insulating washer and the upset end of the stud.

3. A relay such as claimed in claim 1, wherein the stud is carried by a side plate secured to the side of the magnet frame.

JOSEPH L. BONANNO.

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