March 11, 1930. W. W. ROBINSON 1,750,053

HOLDER FOR THERMIONIC TUBES

Filed July 11, 1927

Fig. 1

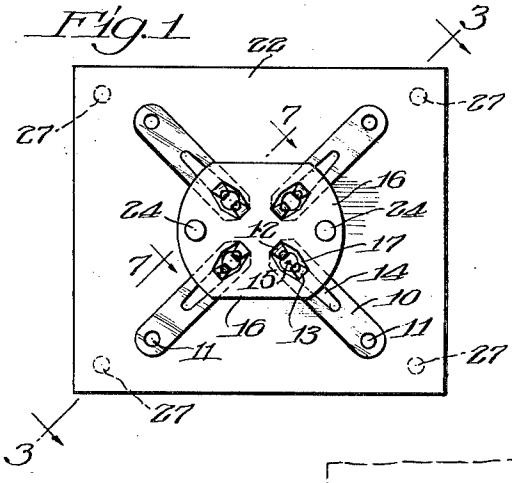
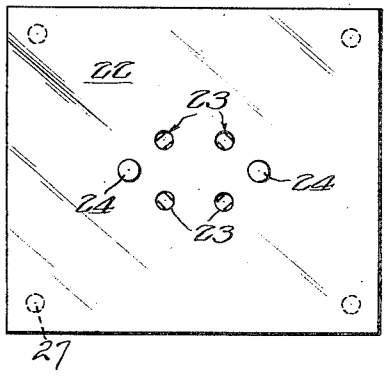


Fig. 2



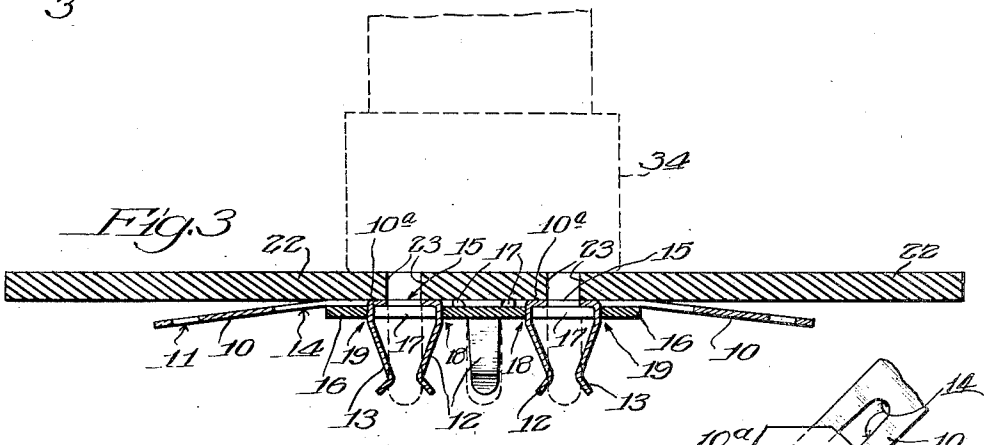


Fig. 3

Fig. 4

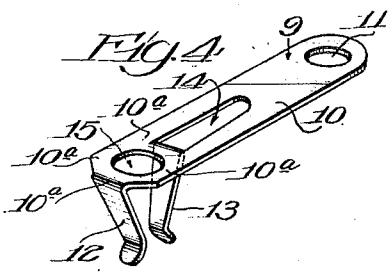
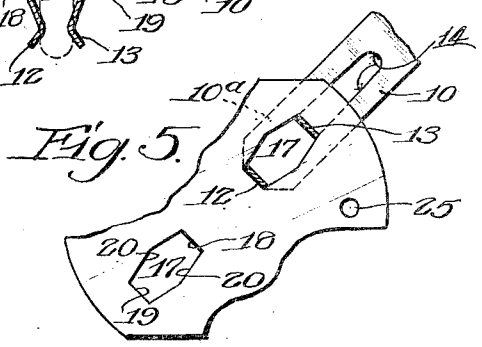


Fig. 5



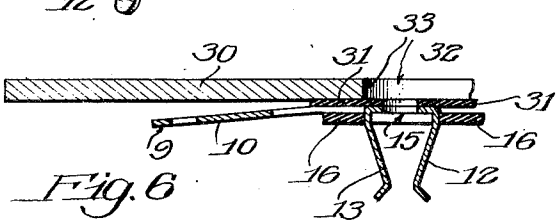
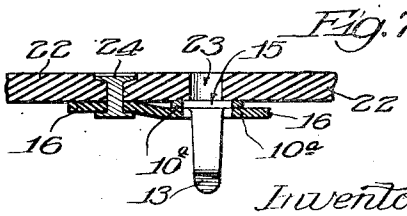


Fig. 6

Fig. 7



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UNITED STATES PATENT OFFICE

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HOLDER FOR THERMIONIC TUBES

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These improvements relate to holders for thermionic tubes. The object is to provide notably simple, cheap and effective means for holding the tube for completing circuits through its electrode terminals.

In the accompanying drawings forming a part hereof Figure 1 is a bottom view of a construction embodying these improvements in a highly advantageous form; Fig. 2 is a top view of the same; Fig. 3 is an enlarged sectional view on the line 3—3 of Fig. 1; Fig. 4 is an enlarged perspective of one of the contact members; Fig. 5 is a more greatly enlarged fragmentary bottom view showing features of the insulating plate; Fig. 6 is a fragmentary sectional view of a modification for use where the main support is of non-insulating material; Fig. 7 is a fragmentary sectional view as on the line 7—7 of Fig. 1.

Fig. 4 shows a preferred construction of the contact member 9 complete. It is formed from a narrow strip of thin and flat spring metal such as brass or hard copper. It has a main body portion 10 having a hole 11 for a wire connection, and is provided with a pair of integral leaf spring contact elements 12 and 13, the element 13 being pressed out of the body 10 leaving an opening 14 therein. Between the ends of the contact elements where attached there is a hole 15 in the body 10 through which the pin-like terminal of a thermionic tube may pass. The metal marked 10^a immediately around this hole 15 forms a base for the spring contacts 12 and 13 and this flange-like base is an important feature in holding the spring elements in place.

In my practice the body member 10 is about an inch and an eighth in length, but may be shorter or longer as preferred. It is about one-fourth of an inch in width and about ten one-thousandths of an inch in thickness when made of hard rolled copper. These proportions also may vary.

The construction shown includes a piece or plate of thin sheet insulating material such as fibre, hard rubber or any one of various laminated paper insulating sheet products well known at the present time. The device is shown as providing for a thermionic tube having four pin-like electrode terminals, and in practice those terminals pass through elongated and substantially radially directed holes 17 in the plate 16. Each hole 17 (Fig. 5) has an outer end wall 18 and opposite it an inner end wall 19, and it has side walls 20 flaring from the end walls respectively. These side walls thus flare to provide a larger open interior to accommodate the tube terminal pins while preserving the end walls 18 and 19 at substantially the width of the contact springs where they lie against these end walls respectively.

Figs. 3 and 5 show that the leaf spring elements 12 and 13 of any of the units project through an opening 17, and with a tight fit at its end walls 18 and 19. In Fig. 5 the spring elements 12 and 13 are cut off at the plate 16 to show that they are of the same width as that of the oblong hole 17 at its ends. The springs 12 and 13 are materially widely spaced apart at their attached ends, and, when positioned in such an oblong hole, they are held against turning, especially when they make such a good interfit with the plate 16 at the end portions of the opening 17.

The spring elements and their base 10^a thus form a unitary contact device held against turning movements when the parts are assembled as in Fig. 3 and with other holding means overlying portions of one side of the plate 16.

The body member 10 extends well beyond the plate 16 and may be bent away from the plane of the base as desired to facilitate attaching a wire thereto. Other forms of wiring terminals for the spring contact members may be employed in some aspects of the invention.

In the device of Figs. 1, 2 and 3 the contact members 9 and the insulating plate 16 were first assembled and then applied directly upon the base 22. The base 22 may be considered to be a baseboard or panel of a radio receiving set and as being of insulating material in sheet or plate form. The base 22 is provided with four openings 23 (Fig. 2) severally in alignment with the aligned openings 15 of the contact member 9 and 17 of the plate 16. A pair of rivets 24

passing through holes 25 in the plate 16 and through corresponding holes in the base 22 bind the plate 16 firmly upon the base and clamp the respective base portions of the contact members firmly and tightly between the plate 16 and the base 22. The contact members as a whole are thus held very securely in insulated relation to each other.

Figs. 1, 2 and 3 show the base 22 as being a rectangular piece of insulating material which may be provided with holes indicated by dotted lines at 27 for attaching the base 22 to some other support. These figures therefore show a complete unit as a commercial article. The present device is employed largely, however, by the manufacturers of radio instruments who apply the assembled unit of elements 9 and 16 directly upon the under side of an insulating base or panel board as 22 on a more extensive scale. The base 22 therefore may also be considered to be such a baseboard or panel. In this latter aspect the elements 9 and 16 constitute a unitary and a complete article of commerce ready for attachment to such a baseboard or panel in the manner illustrated and described.

Fig. 6 shows a construction in which the support 30 is to be considered metallic, such as a sheet metal baseboard in a radio receiving set. The units 9 and 16 are in all respects as already described. The only difference in construction is the addition of an insulating plate 31 which lies between the support 30 and the contact member 9 and plate 16, thus insulating the contact members from the metallic support and from each other. This insulating plate 30 may, for the sake of uniformity in nomenclature herein, be called the base in the construction of Fig. 6 or the plate-like element 30 plus the insulation 31 may be considered the base, such base being provided with insulation between the contact members and the plate 30. The insulation 31 (Fig. 6) has an opening 32 in alignment with the opening 15 of the contact member, and the support 30 has a relatively large opening 33 to accommodate the base as 34, Fig. 3, of the thermionic tube.

I contemplate as being included in the invention all such changes, departures and variations from what is thus specifically illustrated and described as fall within the scope of the appended claims.

I claim:

1. A contact member of the character described comprising a relatively long and narrow piece of thin springy metal having a hole near one end and having adjacent to said hole a pair of integral spring leaves extending substantially at right angles from the metal in which the hole is formed, said leaves being formed to contact a pin-like terminal passing through said hole, one of said spring leaves being formed out of body material of the metal leaving an opening therein of a shape substantially corresponding to that of the spring leaf formed from the metal at that place.

2. In combination, a support having openings to receive the terminals of a vacuum tube, a plate of insulating material having elongated openings therein in registry with said first-mentioned openings respectively and directed outwardly, contact members, one for each of said elongated openings, each contact member comprising a substantially flat, long and narrow part of thin and springy sheet metal lying between said support and said plate and extending outwardly in the direction of said elongated openings respectively, each contact member comprising a pair of leaf-spring contact elements one of which is formed out of the body of said long and narrow part and the other of which is formed from metal at the inner end thereof, each pair of contact elements interfitting with the end walls of the elongated opening associated therewith to hold said contact member strongly against turning, and means free of said contact members for clamping said plate upon said support to clamp said long and narrow parts between the plate and support.

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