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A. I. CRAWFORD

1,884,582

VACUUM TUBE SOCKET

Filed Sept. 21, 1928

FIG. 1.

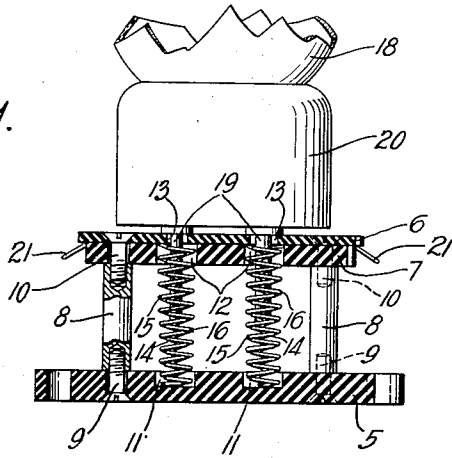


FIG. 2.

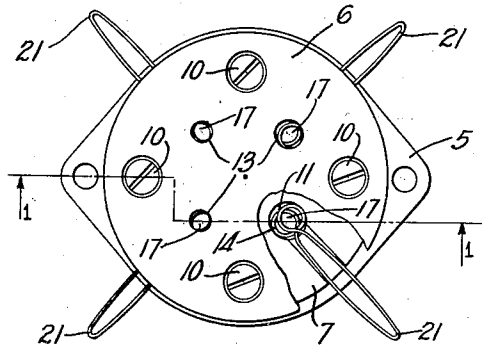


FIG. 3.

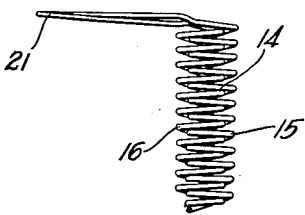
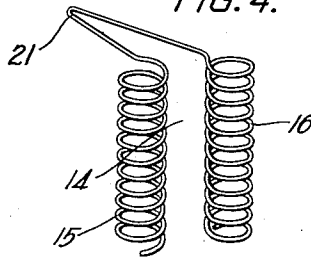


FIG. 4.



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VACUUM TUBE SOCKET

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This invention relates to sockets for vacuum tubes, and in particular to sockets for vacuum tubes in which a plurality of electrodes extend from the base of the tube.

3 Heretofore sockets for the push type vacuum tubes consisted of a disc or block of insulating material having apertures therein to receive the electrodes of a vacuum tube base, these electrodes engaging leaf springs within the socket located in alignment with the apertures. The disadvantages of this construction are the difficulty of maintaining the proper resiliency in the leaf springs after the tube has been put in and taken out a number of times, and the small amount of contact area presented by the contact springs to the electrodes of the tube.

Another type of socket for push type tubes consists of four helical springs mounted in spaced relation in a block of insulating material, the upper end of each spring being of a slightly greater diameter than the bottom. It has been found that after a tube has been put in and taken out of this type of socket a few times, the spring takes a set, thereby releasing the tension of the spring on the electrodes and consequently making very poor contact. This renders the socket practically useless.

30 The object of the present invention is to provide a socket of the latter type which is efficient in use and cheap to manufacture.

In accordance with this invention there is provided two discs of insulating material spaced apart from each other by means of studs, one disc being the face of the socket and the other being the base. The disc forming the face of the socket is provided with apertures arranged to accommodate the terminal pins of a vacuum tube having a push type base. Mounted in alignment with these apertures and extending in a downward direction to the base plate of the socket are four sets of double wound intermeshed helical springs. Each set of springs consists of one right-hand wound spring and one left-hand wound spring. These springs are forced together to provide intermeshed helices having substantially an elliptical cross-section.

50 This arrangement provides a compact

socket for vacuum tubes having bases of the push type, in which the electrodes on the base of the tube, having a substantially circular cross-sectional area are forced into intimate contact with the intermeshed springs due to the elliptical cross-section of the springs.

A feature of the invention is the intermeshing of a right-hand wound helical spring and a left-hand wound helical spring which when the prongs of a vacuum tube are inserted therein exert pressure and make contact with a large area of the prong.

Other features of the invention will be apparent from the following detailed description in connection with the accompanying drawing, in which Fig. 1 is a cross-sectional view, taken at 1—1 on Fig. 2, of a vacuum tube socket made in accordance with the present invention with a vacuum tube inserted therein; Fig. 2 is a plan view of the socket shown in Fig. 1 with a portion broken away to illustrate the position of one of the contact members; Fig. 3 is an enlarged view of one of the contacts with the turns of each helix intermeshed; Fig. 4 illustrates the contact member before the helices have been intermeshed.

Referring now to Fig. 1, the socket of the invention comprises three discs of insulating material, such as hard rubber or the like, the base portion of the socket consisting of the disc 5 and the top portion of the socket consisting of the two discs 6 and 7, the disc 6 being made of much thinner material than the disc 7, forms the face of the socket. Secured to the base 5 by means of the screws 9 are the studs 8, which at their upper end are secured to the discs 6 and 7 by means of the screws 10, thereby holding in definite spaced relation the disc 5 which forms the base and the discs 6 and 7 which form the top portion of the socket.

Located in the base 5 are recesses 11, usually 4 in number, which are arranged at four corners of a square around the axis of the base 5. The discs 6 and 7 are provided with apertures 12 and 13, the apertures 12 being the same diameter as the recesses 11, while the apertures 13 are of a smaller diameter. The apertures 12 and 13 in the discs 6 and 7 are in

alignment with the recesses 11, as shown in Fig. 2. Located in the recesses 11 and extending up through the apertures 12 and abutting against the disc 6 are the wire wound intermeshed helical contact members 14 which as shown in Figs. 3 and 4, consist of two open helices 15 and 16, one wound in a right-hand direction and the other wound in a left-hand direction as illustrated in Fig. 4. These helices are forced together to form a contact member such as shown in Fig. 3, wherein the turns of the helices are intermeshed, thereby providing a central orifice which has a substantially elliptical cross-section as shown at 17 of Fig. 2. Thus when the customary circular terminal pins 19 of the vacuum tube 18 are pushed into the elliptical orifice the turns of the helices 15 and 16 make contact along the entire length of the terminal pins 19. This is clearly shown in Fig. 1 wherein the vacuum tube 18 having the customary terminal pins 19 in the base 20, has been inserted into the socket.

The contact members 14 due to their novel construction are provided with the terminal lugs 21 which are integral with the contact member. These terminal lugs are located in the grooves 22 of the disc 7 and are held in place by means of the disc 6 which is fastened thereon.

While the intermeshed helical contacts have been disclosed as being mounted between two discs of insulating material, it is apparent that other constructions would readily adapt themselves to this type of contact, for example, a molded block of insulating material having the contact springs mounted therein. Furthermore the invention is not limited to a vacuum tube socket since other receptacles may be made with the novel intermeshed helical contact arrangement without departing from the spirit of the invention as defined in the appended claims.

What is claimed is:

1. A socket for electrical devices comprising a top portion having a number of apertures therein and a recess concentric with each of said apertures, a base portion provided with an equal number of circular recesses, means for placing each of said apertures in alignment with a corresponding one of the last mentioned recesses, and contact members between said top and said base portions, said members comprising springs formed as helices, one pair for each aperture, said helices being substantially concentric with said apertures and seated at both ends in said recessed portions.

2. A socket for an electrical device comprising an insulating member having a plurality of recesses therein, a second insulating member having a plurality of apertures therein, means for holding said insulating members in spaced relationship, the apertures and recesses of said members being in alignment,

and a plurality of sets of springs each set comprising double wound intermeshed helical springs, one end of each set resting in an aperture and the other end in a recess in alignment therewith, said springs having soldering terminals integral therewith and bent at right angles to the axes of their respective springs.

In witness whereof, I hereunto subscribe my name this 20th day of September, 1928.

ALLEN I. CRAWFORD.