

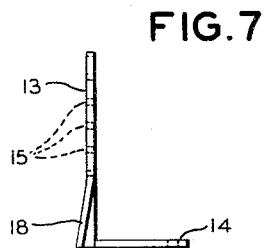
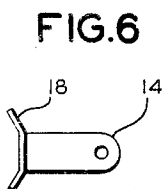
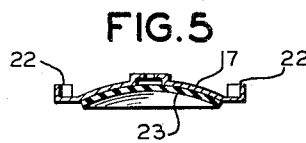
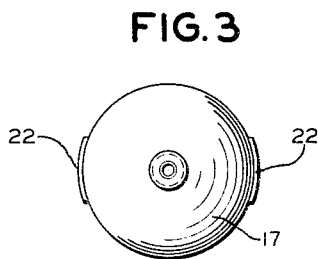
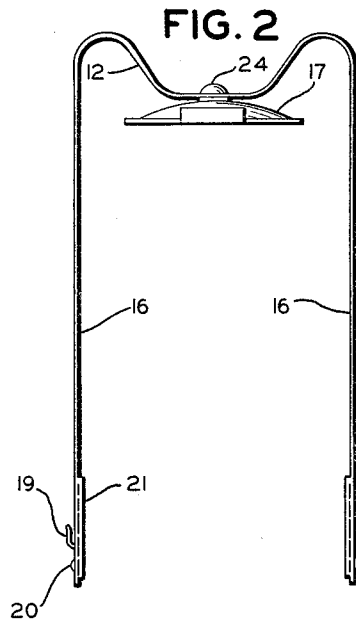
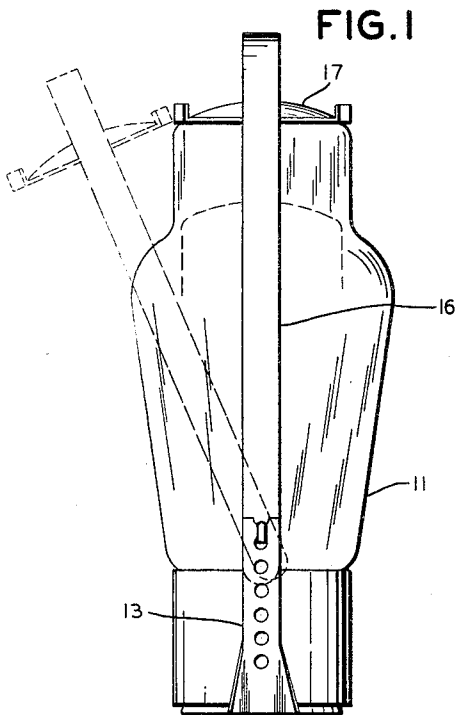
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2,539,581

ADJUSTABLE SPRING HOLD-DOWN FOR RADIO TUBES

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ADJUSTABLE SPRING HOLD-DOWN FOR
RADIO TUBES

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3 Claims. (Cl. 173—328)

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This invention in general relates to clamping apparatus, and in particular to a clamp for holding vacuum tubes rigidly in their sockets.

Vibration has a detrimental effect on the performance of vacuum tubes because it alters the distance between elements within the tube. Since it is virtually impossible to maintain socket holes to such a close fit that there is no play between their walls and the tubes' pins, some external stabilizing device is necessary for tubes subjected to vibration, as those of airborne and shipborne radio systems. Heretofore tube clamps have had several disadvantages, among them being the large space required for tightening the clamping mechanism. Also, the old type clamps were of limited scope in that a clamp was designed to grip only a tube base of a particular size or shape. Furthermore, these old type clamps require working at the base of a tube.

A primary object of the present invention is to generally improve tube clamps by eliminating the foregoing difficulties. Another object of this invention is to provide a clamp for holding an electron tube that may be operated at the top of the tube. These and other objects will be apparent from the following specification when taken with the accompanying drawings, in which:

Fig. 1 shows a complete tube clamp assembly in accordance with the invention holding an electron tube;

Fig. 2 shows the spring clamp member of the apparatus of Fig. 1;

Figs. 3, 4 and 5 show top, side, and section views respectively of the friction cap for gripping the top of the tube; and

Figs. 6 and 7 show bottom and side views respectively of a mounting lug for holding the spring member of Fig. 2.

In the drawings, and more particularly Fig. 1 the complete clamp comprises two supporting lugs 13 with foot flanges 14 (shown in Fig. 7) for attachment to a suitable base. Each lug 13 has a series of holes 15 which may be about 1/4" apart, into an opposite pair of which may be clipped the legs of a generally U-shaped spring member 16. The spring member 16 is disposed over the top of an electron tube 11 or other article to be clamped in position, and spring-action of the indented portion 12 of said member 16 provides desired pressure. A friction cap 17, attached as for example by a rivet 24, to the aforementioned indented portion 12 of the spring member 16, firmly grips the top of the tube 11.

As shown in Fig. 6, the foot flange 14 of each lug 13 may be turned in toward the socket hold-

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ing the electron tube so that the same screw holes, drilled in the chassis for the socket attachment, may also be used for the clamp. Small tapering ears 18 project at an angle from the base of the lug for additional support and to strengthen the lug against the diagonal strain caused when the spring member 16 is clamped over the tube. According to the height of the tube 11, one of a plurality of pair of holes 15 in the vertical members of the lugs 13 is selected for attachment of the spring member 16. In a particular case, if the lugs 13 are too high, any excess length of the vertical portion may be cut off.

The spring member 16, illustrated in detail in Fig. 2, is preferably made of spring tempered carbon steel, but may be made of other suitable materials if desired. These members 16 may be made in various leg lengths in order that the clamp may be used with tubes of different sizes. On each leg of the spring member 16 there is a clip or hook 19, and below it a substantially rounded projection 20, so spaced that when the clip 19 is hooked into one of the holes 15 of the lug 13, the projection 20 will center in the next lower hole. A narrow flange 21 stiffens each end of the spring member 16 between the clip 19 and the projection 20.

The friction cap 17, illustrated in Figs. 3 to 5, inclusive, may be made in various sizes to accommodate tubes of different dimensions. These caps 17 are preferably made of cadmium plated rolled steel, and coated on their inside surface with resilient friction providing material 23, as for example, neoprene, to provide friction surface against the tube. Two edge flanges 22 are provided as comfortable finger grips.

Among the advantages of this tube clamp, as may be seen from the foregoing description, is that it requires about one-half inch less space between tubes than the old type bracelet clamp. It also offers the additional advantage of being workable at the top of the tube instead of the bottom, which tends for easy operation.

The invention described in the foregoing specification need not be limited to the details shown, which are considered to be illustrative of one form the invention may take.

What is desired to secure by Letters Patent and claim is:

1. Apparatus for holding an electron tube firmly in a socket comprising, first and second elongated lugs each apertured along the longitudinal dimension thereof and provided with a foot for engaging said socket, the elongated portions of

said lugs extending toward the top of an electron tube when said tube is in place in said socket, a substantially U-shaped spring member bent inversely at its center and having a hook on each of its free ends for engaging in one of the apertures of each of said lugs, said hooks pivotally securing said spring member to said lugs, a rounded projection on each of said free ends of said spring member for engaging an adjacent aperture in the same lug, a friction cap attached to the inversely bent portion of said spring member, said cap being coated with friction material to grip the top of said tube when said spring member is swung into position over said tube, said engaging projections then preventing said spring member from changing position, whereby said tube is held in said socket.

2. Apparatus for holding an electron tube firmly in a socket comprising first and second elongated lugs each apertured along the longitudinal dimension thereof, said lugs being provided with a foot for engaging said socket and further provided with a stiffening flange on the upright portion thereof, the elongated portion of said lugs extending toward the top of an electron tube when said tube is in place in said socket, a substantially U-shaped spring member bent inversely at its center and having a hook on each of its free ends for engaging one of the apertures of each of said lugs, said hooks pivotally securing said spring member to said lugs, a rounded projection on each of said free ends of said spring member for engaging an adjacent aperture in the same lug, and a stiffening flange on each of said free ends in the region of said hook and said projection, a friction cap attached to the inversely bent portion of said spring member, said cap being coated with friction material to grip the top of said tube when said spring member is swung into position over said tube, said engaging projections then preventing said spring member from changing position, whereby said tube is held in said socket.

3. Adjustable apparatus for holding an electron tube firmly in a socket comprising first and

second elongated lugs each having at least three apertures along the longitudinal dimension thereof, said lugs being provided with a foot for engaging said socket and further provided with a stiffening flange on the upright portion thereof, the elongated portion of said lugs extending toward the top of an electron tube when said tube is placed in said socket, a substantially U-shaped spring member bent inversely at its center in the plane of said U and having a hook on each of its free ends for detachably and pivotally engaging one of the apertures of each of said lugs, the apertures engaged by said hooks being determined by the height of the electron tube to be held, a rounded projection on each of said free ends of said spring member for engaging an adjacent aperture in the same lug, and a stiffening flange on each of said free ends in the region of said hook and said projection, a friction cap attached to the inversely bent portion of said spring member, said cap being coated with friction material to grip the top of said tube when said spring member is swung into position over said tube, said engaging projection then preventing said spring member from changing position, whereby said tube is held in said socket.

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