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C. F. RUDOLPH

PIEZO ELECTRIC CRYSTAL MOUNTING

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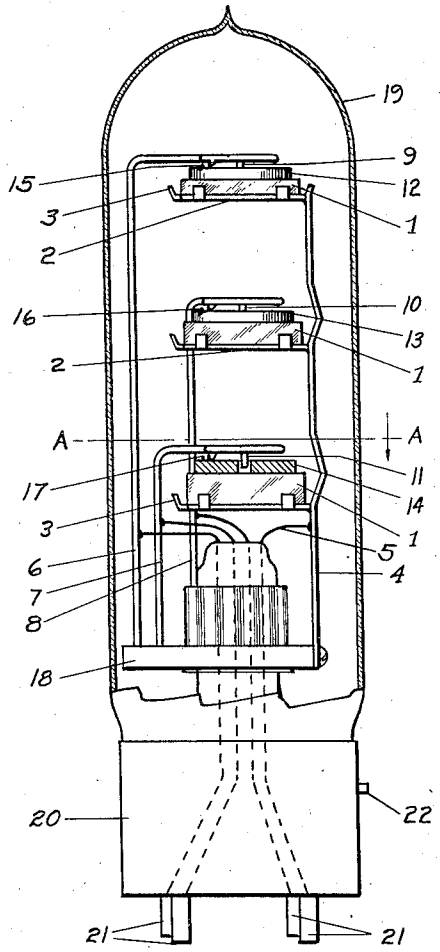


Fig. 1

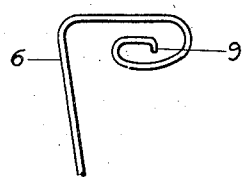
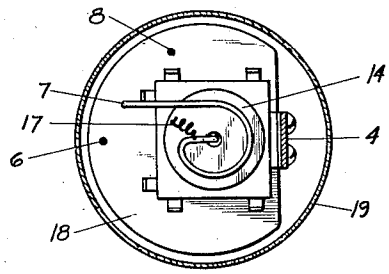


Fig. 2



SECTION A-A

Fig. 3

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UNITED STATES PATENT OFFICE.

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PIEZO-ELECTRIC-CRYSTAL MOUNTING.

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My invention relates broadly to apparatus using piezo electric crystals and more particularly to a crystal holder for use in such apparatus.

The object of my invention is to provide a holder wherein the crystal is protected from variable atmospheric conditions. Another object of my invention is to provide a holder for a plurality of crystals permitting ready change from one crystal to another. A further object of my invention is to provide a holder readily interchangeable with other holders whereby one set of crystals may be quickly substituted for another.

These and other objects are secured by supporting a plurality of crystals on a common base so constructed as to fit in a standard socket for vacuum tubes whereby the connections of the socket are used for establishing circuits through the crystals. The tube, enclosing the crystals, may contain rarified air or any desired gas under any desired pressure or vacuum. The crystals are thereby protected from atmospheric conditions.

Reference is to be had to the accompanying drawing forming a part of this specification in which—

Fig. 1 is an elevation of an embodiment of my invention.

Fig. 2 is a view of a lead-in wire, and

Fig. 3 is a section on the line A—A of Fig. 1.

The crystals 1 are supported on plates 2 having arms 3 bent about the crystals to limit their movement. The plates are carried by a frame 4, that forms a common return for the crystal to the wire 5 secured to the frame. Lead-in wires 6, 7, 8, one for each crystal, provide connections to the respective crystals and are fitted with projecting lugs 9, 10, 11, that fit into holes formed in contact plates 12, 13 and 14 respectively resting upon the crystals, thereby holding the plates from movement. The lugs do not touch the crystals. Light springs 15, 16 and 17 insure contact between the lead-in wires 6, 7 and 8 and the plates 12, 13 and 14. Pigtail connections may be used in place of the springs if desired.

The lead-in wires and the frame 4 are supported from an insulating member 18 enclosed and sealed in a tube 19. The member 18 and tube 19 are secured to a base 20, constructed similar to a vacuum tube base, with projecting pins 21 and socket engaging pin 22 adapted to fit the standard tube socket. The wires 5, 6, 7 and 8 are connected to the pins 21.

By this construction it is evident that any one of the crystals mounted in the tube may be readily changed for any other and one set of crystals quickly substituted for another set. This ease of change in substitution is of particular advantage in circuits wherein a crystal is used to control the frequency of oscillation. With the enclosure of the crystals in a sealed tube, the crystals are protected from any change in atmospheric conditions, such as moisture etc.

It will be understood that the above description and accompanying drawings comprehend only the general and preferred embodiment of my invention and that various minor details in construction and arrangement of parts may be made within the scope of the appended claims and without sacrificing any of the advantages of my invention.

Having thus described my invention what I claim is:

1. In a crystal holder, a base, pins projecting from said base for engagement with contacts of a standard vacuum tube socket, a crystal supported on said base, connections from said pins to said crystal for establishing a circuit, and a tube enclosing said crystal and sealed upon said base.

2. In a multiple crystal holder, a base, a frame secured to said base, plates carried by said frame for supporting crystals, said plates and said frame forming a common return for said crystals, and individual lead-in contacts for said crystals mounted on the base.

3. In a crystal holder, a plate for supporting a crystal, a second plate making a second contact with the crystal, a lug projecting within an opening in said second plate, means supporting said lug and means insuring electrical contact between said lug supporting means and said second plate.

4. In a crystal holder, a plate for supporting a crystal, a second plate making contact with the crystal, a lug projecting within an opening in said second plate to prevent displacement of the plate, and means supporting said lug.

5. In a piezo electric crystal holder, a base, pins projecting from the base for engagement with contacts of a socket, a piezo electric crystal supported upon the base, connections from the pins to the crystal for estab-

lishing a circuit and a tube enclosing the crystal and mounted upon the base.

6. In a piezo electric crystal mounting, a standard, contact plates, one plate supporting a crystal and fixed upon the standard, a second standard and means attached thereto for resiliently holding another of the plates in contact with the crystal.

7. In a piezo electric crystal mounting, a standard, contact plates, one plate supporting a crystal and fixed upon the standard, a second standard and means attached thereto for resiliently holding another of the plates in contact with the crystal, the standards serving as electrical connectors leading to the contact plates.

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