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HOLDER FOR CRYSTAL RESONATORS

Filed April 18, 1928

FIG. 1

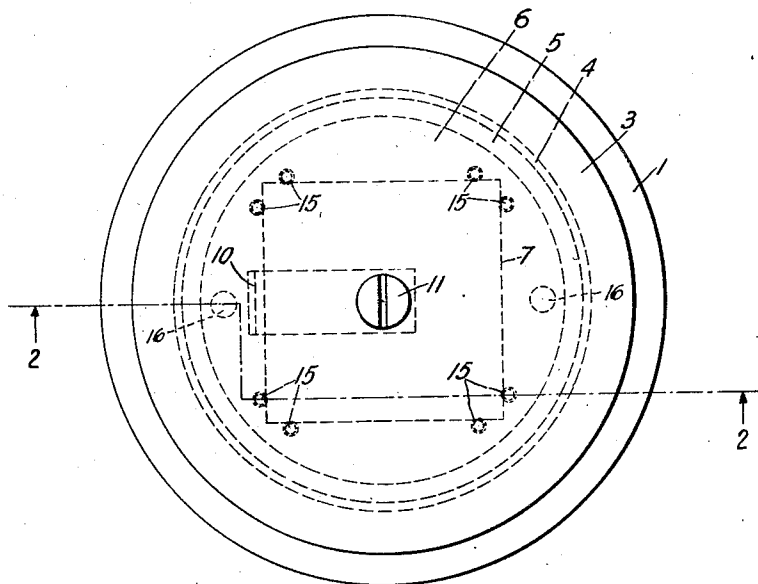
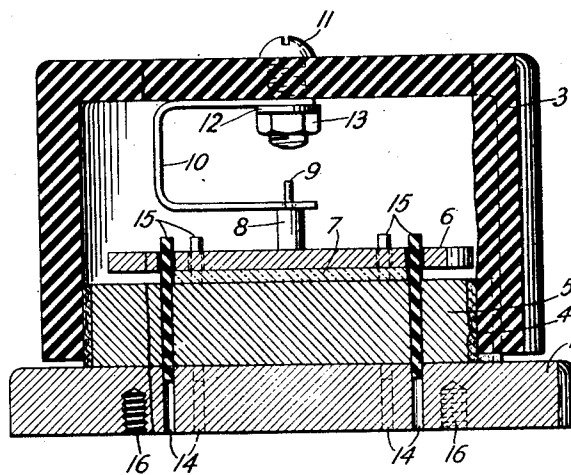


FIG. 2



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HOLDER FOR CRYSTAL RESONATORS

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This invention relates to piezo-electric crystal resonators and more particularly to a holder for and method of mounting a crystal resonator.

5 An object of the invention is to mount a crystal so that sparking does not occur between the crystal and the electrodes associated with it.

10 A feature of the invention is the provision of a holder in which the crystal and its electrodes will be maintained in the proper operative relation, regardless of the vibrations of the crystal.

15 A further feature of the invention is the provision of a holder in which the lower electrode is reversible.

20 In general crystal holders heretofore used include one plate electrode of approximately the same cross-sectional area as the crystal itself. With such holders, it frequently happens that when oscillating, an edge or corner of the crystal becomes displaced so as to extend beyond the edge of an electrode and sparking between the crystal and the plate occurs. Such sparking adversely affects the operation of the system in which the crystal is connected, and tends to shorten the life of, and damage, the crystal.

25 In the present invention there is provided a crystal holder comprising a base having a plurality of pins projecting at right angles thereto, an electrode resting thereon provided with a plurality of holes through which the base pins project, and an upper electrode likewise provided with a plurality of holes through which the base pins project. The base pins maintain the electrodes properly positioned, at all times. The electrode plates are of larger cross-sectional area than the crystal, and the pins, projecting from the base, cooperate with the two electrodes to define an area at least as large as the peripheral dimensions of the crystal.

30 With this method of mounting the lower electrode is detachably associated with the base and hence if its upper surface becomes corroded it may be reversed to provide a clean, uncorroded surface for engagement with the crystal.

35 In the drawing, Fig. 1 is a plan view of a

crystal holder built in accordance with the invention, and

Fig. 2 is an elevation partly in section taken along lines 2—2 of Fig. 1. Similar numerals refer to similar parts in both figures.

The base 1 of the crystal holder is provided with holes 14 adapted to engage pins 15 which are set in the base and project at right angles thereto.

Resting on base 1 is the lower electrode 5, of smaller diameter than base 1, provided with holes through which the pins 15 pass. Surmounting electrode 5 is the cover 3 which may be transparent and fits snugly over a cylindrical section of felt 4 or other suitable material which surrounds electrode 5.

An upper electrode 6, approximately the same diameter as the lower electrode 5, is provided with holes which are adapted to engage the pins 15 projecting from the base. The pins are so arranged with respect to the cross-sectional dimension of the crystal that they define a circumscribing area beyond which the crystal 7 cannot escape when it is placed between the electrodes. At all times the crystal is maintained in proper position with respect to its electrodes.

Electrode 6 has a stud 8 at the center thereof projecting at right angles thereto. The extremity of the stud is reduced at 9 to cooperate with a conductive spring member 10 attached to the cover of the crystal holder. The spring 10 maintains the upper electrode 6 in position and serves as an electrical conductor for connecting this electrode to a contact or terminal, adapted to extend beyond the cover 3, to which an external circuit may be connected.

A bolt or binding post 11, projecting through the cover 3, is provided with a washer 12 and nut 13. The conductive spring member 10 is secured by the washer and nut which serve to maintain the spring in electrical contact with the binding post 11 and to secure the latter to the cover 3.

The base 1 is provided with threaded holes 16 to enable it to be fastened securely to a large mass of copper or other conducting material or other suitable support for the holder.

It will be observed that the crystal is prevented from escaping horizontally by the pins 15 and is prevented from jumping outside of its proper position vertically by the weight of the top electrode 6 and the pressure exerted by the spring member 10.

The crystal holder, as well as the electrodes and the crystal may be of any desired shape.

What is claimed is:

1. A crystal holder comprising a base, a plurality of pins projecting from said base, two electrodes, each having a plurality of holes therein through which said pins project, the one of said electrodes adjacent to the base being reversible, a unitary cover member mounted on said base, and a conductive spring member placed between said cover and the electrode adjacent thereto to maintain said adjacent electrode in its proper position and to constitute an electrical connection from said adjacent electrode to a circuit.

2. A crystal holder for a plate crystal comprising a base with a plurality of pins projecting therefrom, a reversible electrode mounted on said base, having a plurality of holes therein through which said pins project, a second electrode likewise provided with a plurality of holes through which said pins project, a stud projecting from said second electrode, a unitary cover enclosing said electrodes and carrying a conductive spring member bearing on said stud to maintain said second electrode in its proper position and to constitute an electrical connection from the electrode to an external circuit.

In witness whereof, I hereunto subscribe my name this 16th day of April, 1928.

FRANK A. POLKINGHORN.

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