Dec. 28, 1948. F. GRAY 2,457,145

MOUNTING FOR PIEZOELECTRIC CRYSTALS

Filed Jan. 5, 1946

FIG. 1.

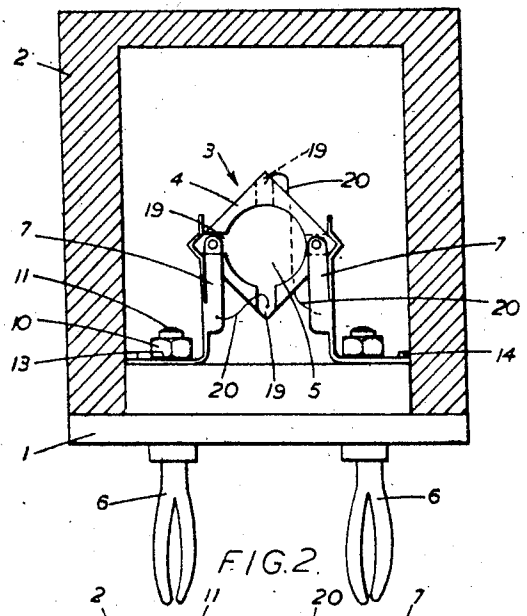


FIG. 2.

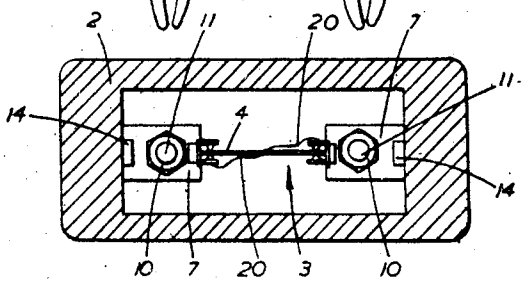


FIG. 3

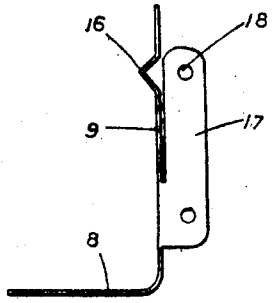


FIG. 4.

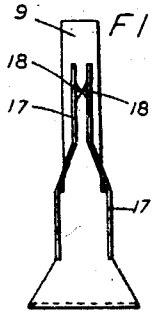
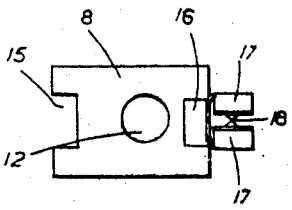


FIG. 5.



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Patented Dec. 28, 1948 2,457,145

UNITED STATES PATENT OFFICE

2,457,145

MOUNTING FOR PIEZOELECTRIC CRYSTALS

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Application January 5, 1946, Serial No. 639,291
In Great Britain January 23, 1945

4 Claims. (Cl. 171—327)

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This invention relates to mountings for piezo-electric crystals; and has for its object to provide a mounting that is of simple manufacture while ensuring a secure grip upon the crystal and attaining the correct electrical conditions.

The main features of the invention are set out severally as claims 1 to 4 of the statement of claim that ends this specification.

The invention will be described with reference to the accompanying drawing, in which:

Fig. 1 is a front view of a crystal holder assembly in accordance with the present invention, the cover being sectioned in order to expose the elements.

Fig. 2 is a plan view thereof, the cover again being sectioned for the purpose stated; and

Fig. 3, 4 and 5 are front view, side view and plan view respectively, on an enlarged scale, of the contact and supporting spring which appears in the earlier figures as the means carrying the crystal.

As shown in Figs. 1 and 2 of the drawing, a base-plate 1 of insulating material has a close-fitting cover 2 also of insulating material. Within the chamber defined by this base-plate 1 and cover 2, and mounted on the base-plate, is a quartz crystal 3. This crystal 3 consists of a square lamina 4 with electrode coatings 5 on the central portions of its main faces. The electrode coatings 5 are in electrical connection with respective terminals 6 in the form of plug-pins projecting from the under-side of the base-plate 1. The present invention is concerned with the mounting of the crystal and the connection of its electrodes to the terminals.

The quartz crystal 3 is gripped cornerwise between the two spring brackets 7 of which one is shown on an enlarged scale in Figs. 3, 4 and 5. The spring brackets 7 are of L-shape with a fixing limb 8 and an upstanding limb 9. The fixing limb 8 lies flat on the top of the base-plate 1 against which it is clamped by means of a nut 10 screwed onto the threaded shank 11 which passes through a hole 12 in the fixing limb 8 and which is integral with the plug-pin 6 forming the terminal. A shake-proof washer 13 underlies the nut 10, and a rectangular stud 14 on the base-plate 1 fits into a corresponding rectangular recess 15 in the fixing limb 8 so that the spring bracket cannot turn about the shank 11. The two brackets 7 when in place have their upstanding limbs 9 in parallel at a distance apart appropriate to the dimensions of the crystal 3.

Each of the upright limbs 9 is formed near its top end with a V-shaped recess 16, the angle of

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the V being rather less than 90°, say 85°. Into these opposed recesses fit the diagonally opposite corners of the square lamina 3 of quartz crystal, a gripping pressure being exerted both along the diagonal between the two brackets and also across each corner by reason of the acute-angle of the V. In consequence, the crystal is firmly held against movement in any direction within the plane of the crystal, but the springs are made of a material thin and springy enough to allow the crystal to oscillate to any frequency.

Each bracket 7 is also formed with two wing-strips 17 which extend up on either side of the upright limb 9 parallel but at right angles thereto, being integrally connected with the upright limb 9 at the lower ends and having their free upper ends on a level with the recess 16. The wings are bent inwards towards one another, and near their free-ends are formed with inward projections 18: thus the two co-operating wings exert a gripping pressure depth-wise upon the quartz lamina 4 across its corner.

Each of the central electrode coatings 5 on the quartz crystal has two extensions 19 to adjacent corners of the lamina 4, so that however the crystal is inserted into its holder, still the two electrode coatings will make electrical connection, one with a wing 17 on one bracket 7 and the other with a wing on the other bracket. However, to make quite sure of the electrical connections, wires 20 are taken from the brackets 7 to the appropriate one of the extensions 19 at the top and bottom of the crystal, being soldered at their ends.

What is claimed is:

1. A mounting for a piezo-electric crystal in the form of a square lamina comprising two spring strips mounted parallel to one another and each having a free end provided with a V-shaped recess, said recesses being adjacent and facing one another, said recesses being shaped so that said V has an angle slightly less than one right angle for receiving opposite corners of the crystal and for exerting a gripping pressure transverse to the diagonal between said corners.

2. A mounting for a piezo-electric crystal according to claim 1 further comprising two pairs of wings, one pair being mounted on each of said strips, the wings of each pair being arranged to grip the crystal depthwise at the said opposite corners.

3. A mounting as claimed in claim 1 in which the electrical connections to electrode coatings on the faces of the crystal are made through said spring-strips.

4. A mounting as claimed in claim 1 in which the spring strips are in the form of bracket members fixed upon a base-plate by nuts threaded upon bolts which are integral with terminals on the underside of the base-plate.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,965,591	Gebhard	July 10, 1934
2,329,497	Washburn	Sept. 14, 1943
2,392,429	Sykes	Jan. 8, 1946
2,409,838	Cress	Oct. 22, 1946

FOREIGN PATENTS

Number	Country	Date
508,657	Great Britain	July 4, 1939