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CRYSTAL HOLDER

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Fig. 1.

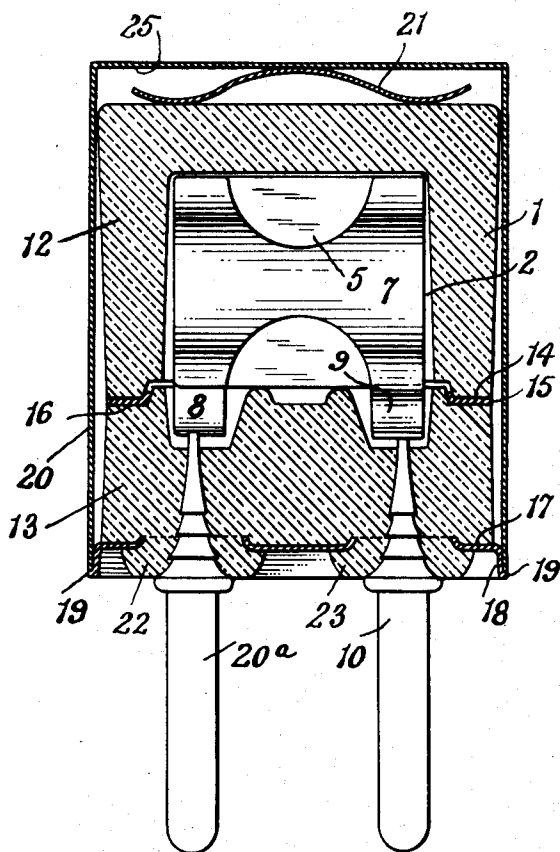


Fig. 2.

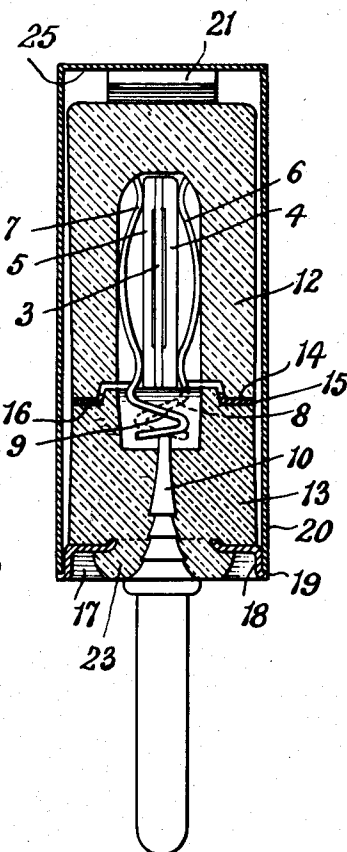
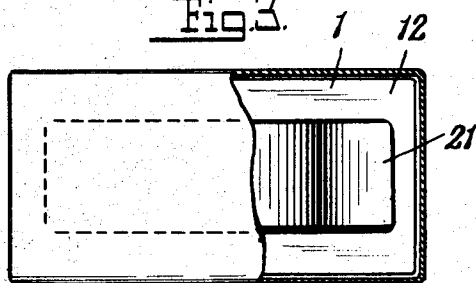


Fig. 3.



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CRYSTAL HOLDER

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10 Claims. (Cl. 171-327)

This invention relates to crystals of the character employed in radio work, such as crystals of quartz, tourmaline, or other piezo-electric material, and one of the objects of the invention is to provide an improved mounting and housing means for crystals of this character.

At the present time, crystals of the kind used for radio purposes, are housed in various ways in box-like enclosures on which a removable cover or end-piece is usually secured by means of screws or similar fasteners. The mounting of the wafer-like crystal between electrodes and the structure of the casing itself are such that both the crystal and its associated elements are often subjected to the effects of climatic conditions and particularly to dampness, heat and cold, vibration and the entry into the casing of dust and dirt, all of which create deficiencies in operation, reduce the activity of the crystal and often result in raising or lowering of the natural frequency.

The present invention contemplates the provision of an air-tight, dust-proof container which will completely exclude moisture, and which includes an outer sealed housing preferably of metal, serving as a shielding and aiding in the elimination of body capacity. The invention also provides means by which a co-operative relationship is established between the outer metallic housing and an inner casing of insulating material whereby the inner casing has its parts firmly held together by resilient means carried by the metallic housing.

In the accompanying drawing, wherein an illustrative embodiment of the invention is disclosed, Fig. 1 is a vertical sectional view of a crystal assembly and enclosure therefor, constructed in accordance with the invention; Fig. 2 is a vertical sectional view, taken at right angles to that of Fig. 1, and Fig. 3 is a top plan view of the structure, with a part of the outer housing broken away to disclose the spring.

In the structure shown, 1 indicates the container or inner enclosure in which the crystal and associated elements are contained. This part of the structure is in the form of a two-part container composed of insulating material such as glass, or of any of the other plastic insulations suitable for the purpose. The container or inner casing 1 includes a bottom or base portion 13 in the form of a molded recessed block, and a top member 12, these parts fitting together so as to co-operate in the formation of a recess 2 shaped to receive the crystal 3, the latter being sandwiched in the conventional manner between

the two electrodes 4 and 5. The electrodes may be in the form of metallic plates, or they may be metallic coatings applied to the opposite faces of the crystal. The crystal assembly, consisting of the crystal 3 and the electrodes 4 and 5 is held firmly between the two spring plates 6 and 7.

The spring plate indicated at 7 has a downward extension or tongue 9 which is held resiliently against the upper end of a contact pin 10, having a part embedded in the base portion 13 of the inner casing, and a part projecting from the casing for reception in the conventional socket. Similarly, the plate indicated at 6 has a downward extension or spring tongue 8 in contact with the upper end of the pin 20a. Through the arrangement described, electrical contact is established between the electrodes 6 and 7 and each of the contact pins 10 and 20a.

The outer casing, which I herein refer to as "a housing" includes a lower portion or base member 17 of metal which is embedded in the base 13 but which permits the emergence of the disk-like parts 22 and 23 of the base 13 around the contact pins. Said member 17 is formed with a dependent flange 17 terminating in an out-turned lip 19. The body portion proper of the housing consists of a cup-shaped cover member 20 which fits over the inner casing 1 and snugly fits around the skirt or flange 18 on the base portion 17 to which it is soldered or otherwise permanently secured. Thus, when the two parts 17 and 20 are joined together in the manner described, they co-operate in the formation of a sealed metallic housing completely enclosing the inner casing 1 and protecting it from the effects of heat, cold, moisture and other climatic conditions, as well as acting as a shielding for the crystal. To assure a tight fit between the skirt 18 and the side wall of the part 20, the skirt 18 may be slightly flared outwardly so that a frictional fit between it and the part 20 is had. This is not suggested as a substitute for a soldered joint between these parts, but rather as an adjunct thereto.

The two parts of the inner casing, consisting of the base or block 13 and the cupped top member 12 fit closely together by means of the interfit of their shoulders 14 and 16, and to effect a seal at this joint between the two parts, a sealing material is interposed as indicated at 15. This sealing material may be in the form of a compressible washer or gasket, or it may be a plastic substance or other material found most effective for attaining a secure seal between the two parts 12 and 13, the nature of the sealing

material used being to some extent dependent upon the nature of the material of which the parts 12 and 13 is made.

Located on the inside of the housing member 20 and attached to the end wall 25 thereof by being welded or otherwise firmly attached thereto, is an arched leaf spring 21 so arranged that when the member 20 is fitted in place, the spring will exert resilient pressure against the closed end of the container member 12 and urge the same toward the base member 13, thus compressing the sealing material or gasket 15 that is interposed between the parts 12 and 13. Accordingly, by the pressure of the spring 21, the parts 12 and 13 of the container are held together and an effective seal between the same is attained.

It will also be noted that the endwise pressure imposed on the part 12 of the inner casing will impose endwise pressure on the spring plates 6 and 7, causing the same to compress the crystal and electrodes firmly between them and retain these parts under the requisite pressure. In addition, such pressure will tend to force the spring plates 6 and 7 in a direction toward the pins 10 and 20a, thus constantly holding the spring tongues 8 and 9 on said plates firmly in contact with the respective pins 10 and 20a.

It will be observed that through the arrangement disclosed, the assembly of the crystal and its associated elements, including its enclosure, is extremely simple, since the parts are readily placed in position. The two parts 12 and 13 are placed together with the sealing material 15 interposed between them, and then the outer housing member 20 is fitted in place and soldered to the skirt portion 18. The out-turned lip 19 acts to position the member 20 and to limit the extent of its overlap with the skirt 18. When the housing member 20 is put in place, the spring 21 comes into contact with the end of the casing member 12, resiliently forcing the same toward its companion member 13, compressing the sealing material 15 and providing a sealed joint between the two parts 12 and 13. At the same time, part 12 acts to urge the spring plates 6 and 7 toward the contact pins 10 and 20a, holding the tongues 8 and 9 firmly against the pins. The construction described thus provides a dual enclosure whereby the crystal and its associated parts are fully protected under all conditions of use.

What I claim is:

1. In a crystal assembly, a holder having an inner casing composed of insulating material, said casing being composed of at least two parts fitting together, an outer housing of metal provided with an interior spring operative against one of the parts of the casing to urge said part toward the other part of the casing.

2. In a crystal assembly, a holder including an inner casing composed of insulating material, said casing being in two parts fitting together to enclose the crystal and electrodes, sealing means interposed between said parts, a housing extending over and enclosing the inner casing, a part of

said housing being provided with spring means operative against one of the parts of the inner casing to urge said part toward the other part of the casing and to compress the sealing means.

3. A crystal assembly, as called for in claim 2, wherein the spring means is in the form of an arched leaf spring having its end portions operative against the part of the inner casing.

4. In a crystal assembly, a crystal and electrodes, a two-part casing of insulating material within which the crystal and electrodes are contained, a two-part metallic housing enclosing the casing, one of the parts of the metallic housing being provided in its interior with a leaf spring operative against a part of the casing to urge said part toward its companion part and maintain the parts of the casing in interfitted relation.

5. A crystal assembly, as called for in claim 4, wherein a sealing material is interposed between the two parts of the casing and is compressed by the pressure of the spring.

6. In a crystal assembly, a block of insulating material, contact pins around which said block is embedded, a metallic flange having parts embedded in the block and parts forming a skirt around the block, a cupped member of insulating material fitting on top of the block and co-operating therewith in forming an insulating enclosure for a crystal and electrodes, a gasket interposed between the cupped member and the block, a metallic housing fitting over the cupped member and over the sides of the block, said housing having a part fitting over and secured to the skirt to co-operate therewith in enclosing the block and the cupped member, said metallic housing having resilient means within it and operative against an end of the cupped member to urge the same against the block and to compress the gasket.

7. A crystal assembly as called for in claim 6, wherein the resilient means is in the form of an arched leaf spring secured to an end wall on the metallic housing and is operative against a closed end portion on the cupped member.

8. In a crystal assembly, a crystal and electrodes, a container therefor consisting of parts of insulating material disposed in interfitted relation, and an outer casing of metallic parts enclosing the container, said casing having resilient means for urging the parts of the container toward one another.

9. In a crystal assembly, a crystal and electrodes, a container therefor consisting of parts of insulating material disposed in interfitted relation, and an outer metal casing enclosing the container, and a spring interposed between the metal casing and the container for urging the parts of the container toward one another.

10. In a crystal assembly as called for in claim 9, a gasket interposed between the parts of the container, said gasket being compressed by the spring.

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