Oct. 16, 1945. C. C. McCAIN 2,387,083

ARTICLE ASSEMBLING FIXTURE

Filed Feb. 2, 1944 2 Sheets-Sheet 1

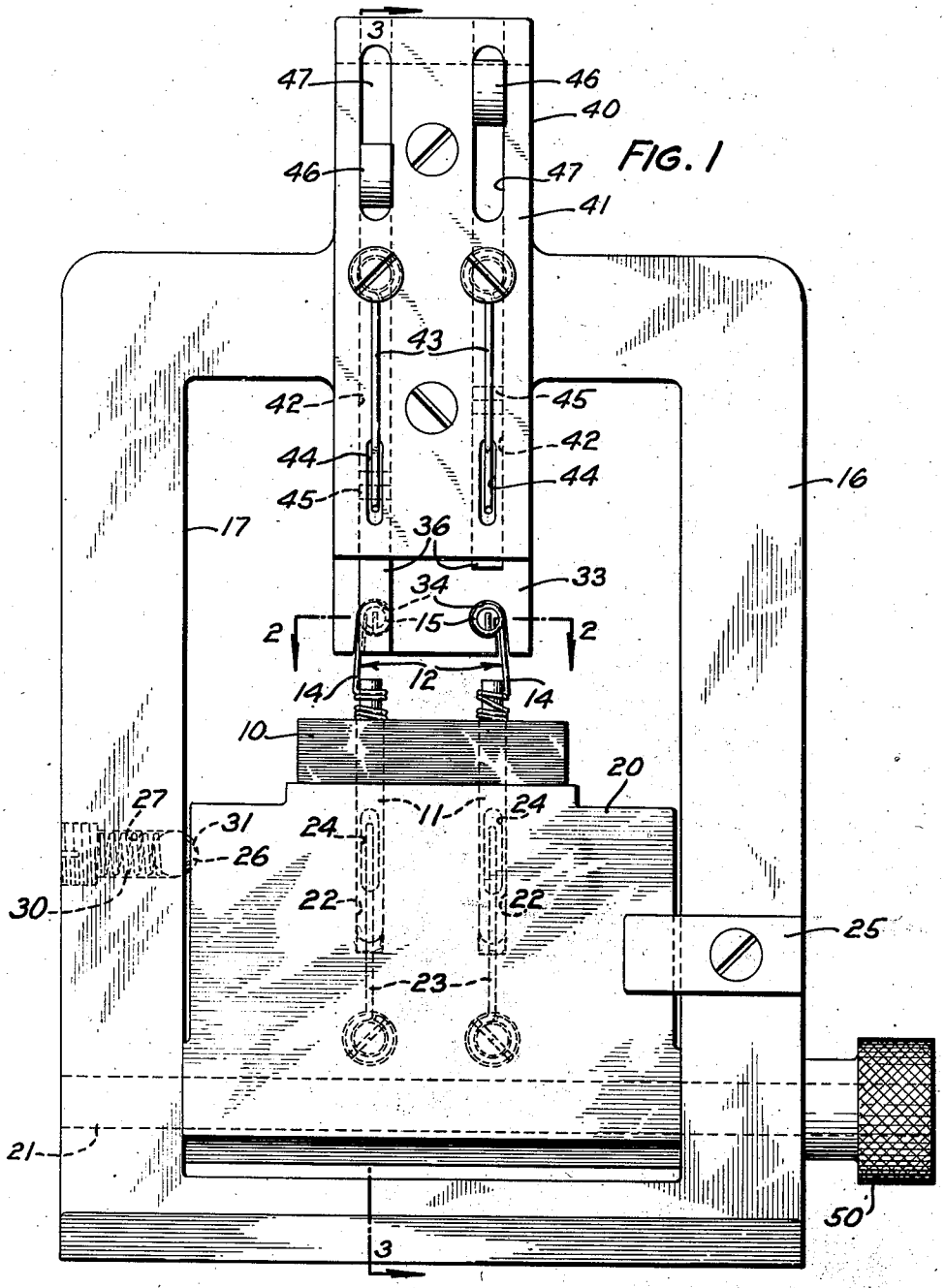


FIG. 1

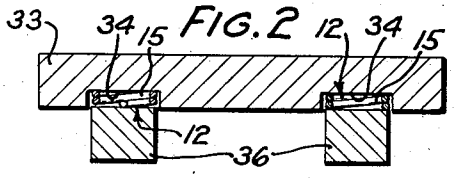


FIG. 2

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ARTICLE ASSEMBLING FIXTURE

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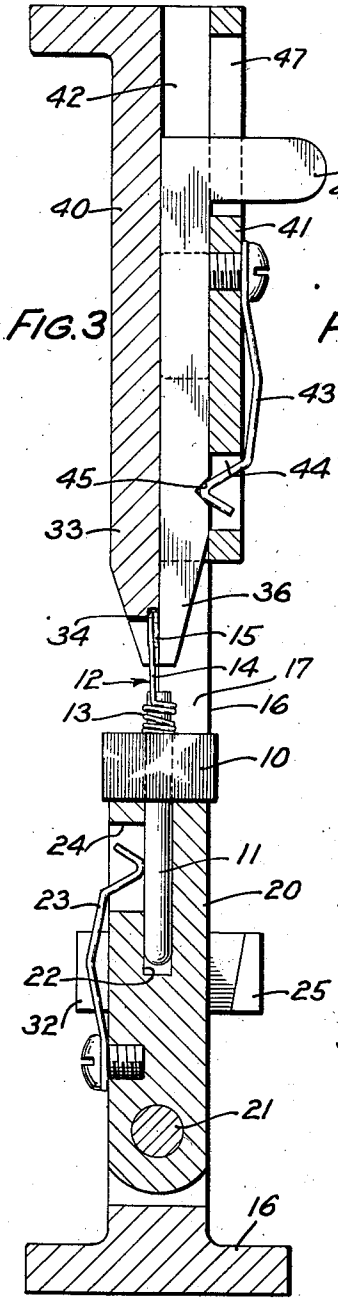


FIG. 3

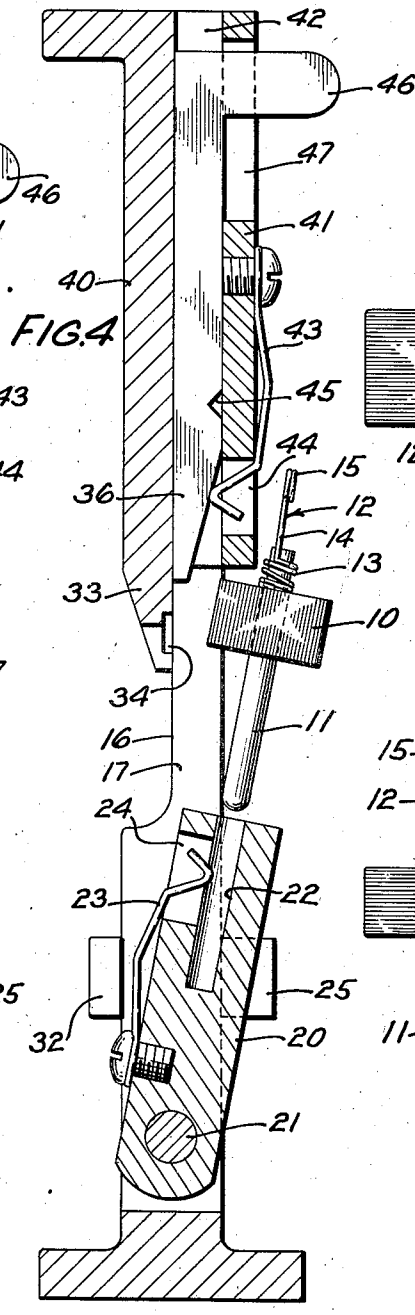


FIG. 4

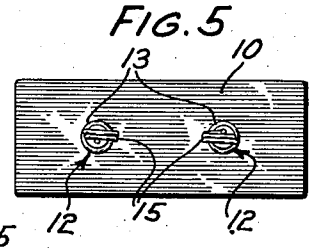


FIG. 5

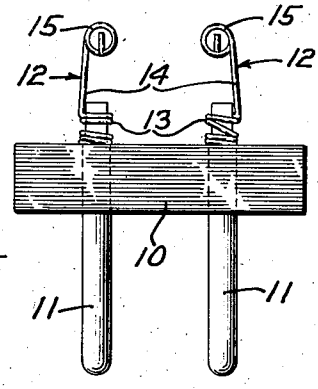


FIG. 6

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Patented Oct. 16, 1945

2,387,083

UNITED STATES PATENT OFFICE

2,387,083

ARTICLE ASSEMBLING FIXTURE

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Application February 2, 1944, Serial No. 520,794

13 Claims. (Cl. 113—99)

This invention relates to article assembling fixtures and more particularly to a fixture for assembling quartz crystal mounting wires on their respective supporting terminal posts.

In the manufacture of certain types of quartz crystals for use as frequency control devices in electronic apparatus, it is sometimes the practice to support the quartz crystal between a pair of lead wires. It is important that the lead wires be accurately aligned with respect to each other and with respect to the terminal posts on which they are mounted.

It is an object of the present invention to provide an efficient and effective fixture for assembling quartz crystal mounting wires on terminal posts.

In accordance with one embodiment of this invention, a fixture for assembling quartz crystal mounting wires on supporting terminal posts mounted in a crystal housing base block is provided comprising a pivotal support for the base block and a plate associated with the support and suitably recessed to receive the upper portions of the mounting wires. The terminal posts, with the wires loosely assembled thereon, are placed on the pivotal support, which is then pivoted to position the upper portions of the mounting wires in the recesses in the plate. Slidable retaining members are mounted on this plate to clamp the wires in the recesses during the soldering operation.

Other objects and advantages of this invention will be more apparent from the following detailed description taken in conjunction with the drawings, wherein

Fig. 1 is a front elevation of a fixture constructed in accordance with this invention;

Fig. 2 is a detail sectional view along the line 2—2 of Fig. 1;

Fig. 3 is a vertical sectional view along the line 3—3 of Fig. 1;

Fig. 4 is a sectional view similar to Fig. 3, except showing the pivotal support pivoted outwardly;

Fig. 5 is a detail plan view of an assembled article; and

Fig. 6 is a side elevation of this article.

Referring now to the drawings, and particularly to Figs. 5 and 6, wherein the article with which this fixture is intended to be employed is illustrated, it will be seen that this article comprises an elongated base block 10 of rectangular cross section, which is commonly made of a phenolic condensation product and through which extends a pair of terminal posts 11. The posts extend transversely through the base block and are substantially parallel to each other, being positioned in opposite end portions thereof, as shown. On each of these terminal posts, as shown in these figures, is positioned a mounting wire 12 comprising a helical lower portion 13, a substantially straight mid-portion 14 and a helical upper portion 15 which is coiled in a plane at right angles to the plane of the lower portion 13. The purpose of the present invention is to provide a fixture by which these mounting wires may be accurately aligned with and positioned on their respective terminal posts.

Referring to Fig. 1, it will be seen that this fixture comprises a rectangular frame 16, the central portion of which is provided with a rectangular aperture 17. A flat plate 20 of slightly less width than the aperture 17 is pivotally mounted in the lower portion of the aperture 17 on a rotatable shaft 21 which extends horizontally across the lower portion of the frame 16. A pair of vertically extending apertures 22 are formed in the upper portion of the plate 20 and spaced apart the same distance the terminal posts 11 are spaced apart on the base block 10. These apertures are of suitable size to receive the lower portions of the terminal posts 11 and a pair of springs 23 are mounted on a side of the plate 20 so that their upper portions will extend through a pair of slots 24 formed on the same side of the plate 20 to permit the upper portions of the springs 23 to bear against the terminal posts 11 when inserted in the apertures 22 and, thus, to retain the terminal posts and base block in position on the plate 20.

When assembling the base block 10 on the plate 20, the plate 20 is pivoted forwardly to the position shown in Fig. 4 to facilitate insertion of the terminal posts in the apertures 22. A small block 25 is mounted on one side of the frame 16 to predetermine the position to which the plate may be pivoted while a spherical member 26 is mounted in an aperture 27 formed in the inner side of the frame 16 and is urged against the adjacent side of the plate 20 when the plate is pivoted into the assembly position after the base block 10 has been placed thereon. A spring 30, mounted in the rear portion of the aperture 27, urges the spherical member 26 forward and a small recess 31 is formed in the side of the plate 20 to receive the forward portion of the spherical member 26. A stop member 32, mounted on the opposite side of the frame from the stop member 25, prevents the plate from being pivoted rearwardly past the spherical member 26.

When the plate 20 is in the position in which it is held by the spherical member 26, the upper portions 15 of the mounting wires 12 will rest against a downwardly extending, integrally formed portion 33 of the frame 16. The lower end of this downwardly extending portion is provided with a pair of circular recesses 34 in which the coiled upper portions 15 of the mounting wires may be received and by which the mounting wires may be accurately positioned with respect to the terminal posts 11. A short slot extends downwardly at a tangent to the circular recesses 34 to receive the straight portions 14 of the mounting wires.

After the upper portions of the mounting wires have been assembled in the recesses 34, a pair of retaining fingers 36, which are slidably mounted on the frame 16 and the lower portions of which bear against the downwardly extending portion 33 of the frame, are moved downwardly to clamp the coiled portions 15 of the mounting wires in the recesses 34. The integrally formed portion 33 of the frame 16 has an upwardly extending integral portion 40, as may be clearly seen in the drawings, and the upper portions of the fingers 36 extend thereover. A retaining plate 41 is attached to the portions 33 and 40 of the frame 16 and holds the fingers 36, which are of rectangular cross section, in vertically extending grooves 42 formed in the portions 33 and 40 of the frame 16. A pair of springs 43, similar to the springs 23, mounted on the plate 20, are mounted on the retaining plate 41 and extend through slots 44 formed in the lower portion thereof so as to bear against the upper sides of the fingers 36 and urge the fingers against the portion 33. These fingers are provided with notches 45 in which the ends of the springs 43 are receivable so that, when the fingers are moved downward to clamp the upper portions of the mounting wires in the circular recesses 34, the fingers will not accidentally move away. A pair of lugs 46 are mounted at right angles to the upper ends of the fingers 36 and extend through slots 47 formed in the upper portion of the retaining plate. These lugs facilitate moving the fingers upward or downward.

After the mounting wires have been clamped in the circular recesses 34 by moving the fingers 36 downward, solder is applied to the lower portions 13 of the mounting wires, which are coiled about the upper ends of the terminal posts 11 to rigidly attach the mounting wires thereto. The fingers 36 are then moved upward and the plate 20 pivoted outwardly to permit removal of the block 10 and associated parts, a knurled knob 50 being attached to one end of the shaft 21 to facilitate rotation thereof.

While but one embodiment of this invention has been shown and described, it will be understood that many changes and modifications may be made therein without departing from the spirit or scope of the present invention.

What is claimed is:

1. A fixture for assembling a mounting wire on a terminal post comprising a pivotal support for the terminal post, means positioned adjacent said pivotal support and having a recess formed therein to receive an offset portion of said mounting wire to position the offset portion of said mounting wire in a predetermined relation to said terminal post, said pivotal support being movable to carry the offset portion of the mounting wire into said recess of said positioning means and means for retaining said offset portion of said mounting wire on said positioning means.

2. A fixture for assembling a mounting wire on a terminal post comprising a pivotal support for the terminal post, means for retaining the post on the support, means positioned adjacent said pivotal support and having a recess formed therein for receiving an offset portion of said mounting wire to position said offset portion of said mounting wire in a predetermined relation to said terminal post, said pivotal support being movable to carry the offset portion of the mounting wire into the recess of said positioning means and means movable relatively to said positioning means for clamping said mounting wire on said positioning means.

3. A fixture for assembling a mounting wire on a terminal post comprising a plate having an aperture formed therein to receive a portion of said post, resilient means associated with said plate for retaining said post in said aperture, means positioned adjacent said plate and having a recess formed therein to receive an offset portion of said mounting wire to position the offset portion of said mounting wire in a predetermined relation to said terminal post, and means for retaining said offset portion of said mounting wire in said recess in said positioning means.

4. A fixture for assembling a mounting wire on a terminal post comprising a plate having an aperture formed therein to receive a portion of said post, resilient means associated with said plate for retaining said post in said aperture, said plate being slotted adjacent said aperture to permit a portion of said resilient means to bear against said post, means positioned adjacent said plate and having a recess formed therein to receive a portion of said mounting wire, and means for holding said portion of said mounting wire in said recess.

5. A fixture for assembling a mounting wire on a terminal post comprising a pivotal support for the terminal post, means for retaining the post on the support, means adjacent said support for receiving a coiled end portion of said mounting wire to position said coiled end portion of said mounting wire in a predetermined relation to said terminal post, said pivotal support being movable to carry the coiled end portion of the mounting wire to the positioning means and means for clamping said coiled end portion of said mounting wire on said positioning means adjacent said support.

6. A fixture for assembling a mounting wire on a terminal post comprising a support for the terminal post, means adjacent said support having a recess formed therein to receive a coiled end portion of said mounting wire to position said coiled end of said mounting wire in a predetermined relation to said terminal post, and a finger slidably mounted on said means and movable to retain a portion of said mounting wire in said recess.

7. A fixture for assembling a mounting wire on a terminal post comprising a support for the terminal post, means adjacent said support having a recess formed therein to receive a coiled end portion of said mounting wire to position said coiled end of said mounting wire in a predetermined relation to said terminal post, a finger slidably mounted on said means and movable to retain a portion of said mounting wire in said recess, and resilient means associated with said slidable finger for preventing accidental shifting thereof.

8. A fixture for assembling a mounting wire on a terminal post comprising a plate having an aperture formed therein to receive a portion of

said post, resilient means associated with said plate for retaining said post in said aperture, means adjacent said plate having a recess formed therein to receive a portion of said mounting wire, a finger slidably mounted on said latter means and movable to clamp a portion of said mounting wire in said recess, and resilient means associated with said slidable finger for preventing accidental shifting thereof.

9. A fixture for assembling a mounting wire on a terminal post comprising a plate having an aperture formed therein to receive a portion of said post, means adjacent said plate having a recess formed therein to receive a coiled end portion of said mounting wire to position said coiled end of said mounting wire in a predetermined relation to said terminal post, and a finger slidably mounted on said means and movable to clamp a portion of said mounting wire in said recess.

10. A fixture for assembling a mounting wire on a terminal post comprising a pivotally mounted plate having an aperture formed therein to receive a portion of said post, resilient means associated with said plate for retaining said post in said aperture, means adjacent said plate and having a recess formed therein to receive a portion of said mounting wire, and means for clamping said portion of said mounting wire on said means.

11. A fixture for assembling a mounting wire on a terminal post comprising a plate having an aperture formed therein to receive a portion of said post, means adjacent said plate having a recess formed therein to receive a portion of said mounting wire, a finger slidably mounted on said latter means and movable to clamp a portion of said mounting wire in said recess, and resilient means associated with said slidable finger for preventing accidental shifting thereof.

12. A fixture for assembling a mounting wire on a terminal post comprising a pivotally mounted plate having an aperture formed therein to receive a portion of said post, means adjacent said plate having a recess formed therein to receive and position an offset portion of said mounting wire in a predetermined relation to said terminal post, and means for clamping the offset portion of said mounting wire on said positioning means.

13. A fixture for assembling mounting wires on terminal posts of a device comprising a pivotal support having a plurality of apertures therein to receive a portion of the posts of said device, means positioned adjacent said pivotal support and having a plurality of recesses for receiving and positioning the coiled ends of said mounting wires in a predetermined relation to each other and to said posts, and means for retaining said coiled ends of said wires on said positioning means while said mounting wires are fixed to said posts.

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