This invention relates to intermediate frequency transformer assemblies particularly those which are tunable by means of adjustable iron cores. More particularly, my invention relates to such transformer assemblies having fixed-capacitor units including means for supporting the coil assemblies from the fixed-capacitor units.

Intermediate frequency transformers have long used a variable capacitor as the adjustable tuning member. Recently it has been found desirable to tune the transformer by means of adjustable iron cores positioned adjacent the coil assembly. In this arrangement the capacitor is fixed in nature.

While transformer assemblies employing fixed-capacitor units have been proposed, the method and means employed to assemble the transformers and in particular the capacitor base unit has proved unsatisfactory in several respects.

In the manufacture of such intermediate frequency transformers it is desirable to produce a compact assembly which will achieve the desired result with a minimum of components, easily assembled, consistent with satisfactory performance. It has been found that in those intermediate frequency transformer assemblies employing adjustable tuning slugs that the movement of such tuning slugs has tended to cause the insulating support for the coils to rotate with deleterious results. It is therefore desirable to produce intermediate frequency transformer assemblies in which the coil supporting members are securely attached to the fixed-capacitor base unit.

Further, it is desirable in such transformer assemblies to employ a base unit in which the capacitive elements are secured therein in a simple yet efficient manner and in which here-tofore used auxiliary compression members and now superfluous rivets are obviated.

It is therefore an object of this invention to provide an improved capacitor base unit for an intermediate frequency transformer.

It is another object of this invention to provide an improved fixed-capacitor base unit having improved means for supporting the insulating coil support member.

It is still a further object of this invention to provide an improved fixed-capacitor base unit for an intermediate frequency transformer assembly having improved means for securing the capacitive element within the base unit.

More specifically, it is an object of this invention to provide an improved intermediate frequency transformer assembly having improved means for fixedly securing the coil support member to the fixed capacitor base unit and having, itself, improved means for securing the capacitive element within the base unit.

For additional objects and advantages and for a better understanding of my invention, attention is now directed to the following description and accompanying drawing. The features of this invention which are believed to be novel are particularly pointed out in the appended claim.

In the drawing:

Fig. 1 is a cross-sectional view of the improved intermediate frequency transformer assembly.

Fig. 2 is a perspective view of the improved transformer assembly shown in Fig. 1 with the shielding member and chassis removed.

Fig. 3 is an exploded perspective view of the transformer assembly shown in Fig. 2.

Referring to Figs. 1 and 2, I have shown an intermediate frequency transformer assembly including the general outline, function and operation of which are well known in the prior art. The assembly includes a metallic shielding can which may be secured to the chassis of any radio receiver or other translating apparatus employing such transformers by means of the U-shaped spring clip member. This clip member engages the metallic shielding can through suitable apertures therein.

Positioned within the metallic shield is the coil assembly which comprises an insulating cylindrical support member upon which the coils are wound. It will be understood that these coils are spaced apart according to known techniques imparting the desired inductance relationship therewith.

The insulating coil support member includes a plurality of spaced-apart vertically aligned notches which are engaged by the threads of the adjustable core members and which are positioned within the cylindrical insulating support member.

The cylindrical hollow insulating support member is secured at its upper end within the offset portion of the shielding envelope and is secured at the lower end within the fixed-capacitor base unit.

The fixed-capacitor base unit, to be described in more detailed manner below and in connection with Fig. 3, generally includes a housing, a capacitive element and a cover member.

Suitable apertures are provided for the admittance of tools to adjust the movable iron cores and. Opening is provided on the top offset portion of the metallic shield and a similar opening is provided in the base unit. Terminal members contact the capacitive element within the base unit and are connected by suitable leads to the appropriate coils and.

Referring now to Fig. 3, which is an exploded perspective view of the fixed-capacitor base unit, a plastic housing member includes a relatively thick bottom portion and side walls.
The bottom 22 incorporates a centrally disposed aperture 13 through which the tuning tool here-tofore referred to may be inserted. This aperture 13 bears special attention in that the inner surface 21 generally tapers inwardly from the top of the bottom portion 22 and includes the key portion 20 and 25. It is into this aperture 13 that the insulating coil support member 7 is inserted. The lower portion of the insulating support member 7 includes key ways 20—23 of the inner surface 27. It will be evident that the tapered surface and keying action provide a convenient means for assuring that the support 7 will fit snugly within the housing 15 and further that it will not move or rotate when the iron slugs 11 and 12 are rotated therein.

The side walls 23 and 24 of the housing 15 include grooved portions 32. The terminal members 20 are adapted to be inserted within these grooved portions.

The heretofore mentioned terminal members 20 are L-shaped in configuration and comprise a downwardly extending lead securing portion 33, having lead admitting apertures 34 and a capacitor contact engaging portion 35 which engages the capacitive element 16 located within the housing.

The capacitive element 16 may comprise a sheet 36 of insulating material such as mica, having a conducting material 38 coated on opposite sides thereof. The mica insulating member 38, suitably silvered, incorporates a centrally disposed aperture 19 large enough to admit the insulating support member 7 when positioned within the housing.

The cover and securing member 17 is composed of plastic material and includes a central aperture similar to that described in connection with the capacitive element. This cover member 17 fits within the plastic base or housing member 15. When the terminal members 20 and capacitive element 16 are suitably secured within the housing member 15, this cover member 17 is fused to the housing 15 thereby securing a compact and easily assembled base unit. Although it may be fused along each edge, it is shown fused at opposite edges 37.

For purposes of optimum fusion between the cover 17 and the housing 15, both members may be composed of a similar plastic material. In our embodiment polystyrene has been employed. It will be understood that this is by way of illustration only and in no sense is to be considered a limitation.

The intermediate frequency transformer assembly including the fixed-capacitor base unit may be assembled according to the following plan. First, suitable contact members 20 are positioned within the housing 15, the depending halves passing through the grooved portion 32 having lead admitting apertures 13. The capacitive element 16, having two pairs of oppositely disposed silvered surfaces is then positioned on top of the two terminal members whereby each terminal member 25 contacts but one silvered area. Two other terminal members are then similarly positioned within the housing above the capacitive unit. The plastic cover member 17 is then positioned on top of the capacitive element 16 and terminals 20. The edges of the plastic cover 17 and the upper edges of the side wall portions 23—4 of the housing are then subject to heat and/or pressure so as to fuse the cover member to the housing. It will be evident then that a compact base unit is thus provided which may be readily assembled and easily fas-

The coil assembly 6, comprising the cylindrical insulating support 7, the spaced-apart coils 8 and 9, and the adjustable tuning cores 11 and 12, may then be positioned so that the lower portion of the insulating support 7 having keyways 20 and 23 fits within the base unit 14. The key portions 20—23 of the tapered surface 27 engage the keyways of the insulating support member 7. The lead connections 21 from the coils 8 and 9 may be then conveniently made to the terminal members 20 and the assembly enclosed by the metal can or shielding member 2. The bottom portion of the shielding can 2 fits snugly around the fixed-capacitor base unit 14 and may include suitable tab portions (not shown) to fasten the shield to the housing. These tab portions may be of any desired configuration.

It will be apparent that more than one capacitive element may be provided within the base unit and that under certain circumstances, more than two coils may be positioned on the insulating support.

Thus, we have described an improved intermediate frequency transformer assembly which facilitates the manufacture of such units by reducing the number of required parts, by providing an improved fixed-capacitor base unit which incorporates a tapered opening and keyed portions adapted to engage and firmly secure the insulating coil support member and further by providing an improved cover member which is fused to the plastic housing, forming a compact unitary fixed-capacitor base unit.

While a specific embodiment of our invention has been shown and described and certain modifications have been suggested, it will of course be understood that various other modifications may be made without departing from the principles of the invention. The appended claim is therefore intended to cover any such modifications within the true spirit and scope of the invention.

What we claim as new and novel and desire to be protected by United States Letters Patent is:

In a coil assembly, an insulating coil support member having a keyway at one end thereof, a fixed-capacitor base unit comprising an insulating plastic housing member having a bottom portion and sidewall portions, said bottom portion including a centrally disposed tapered aperture having a key portion adapted to engage said keyway of said coil support member, a fixed capacitor fitting within said housing and including a centrally disposed aperture, contact terminal members engaging said capacitor and a plastic cover member securing said capacitor within said housing member and having a centrally disposed aperture admitting said support member, said cover member being fused with said sidewalls at the respective edges thereof.

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