Sept. 17, 1935. P. J. SNIDER 2,014,820

VARIOMETER

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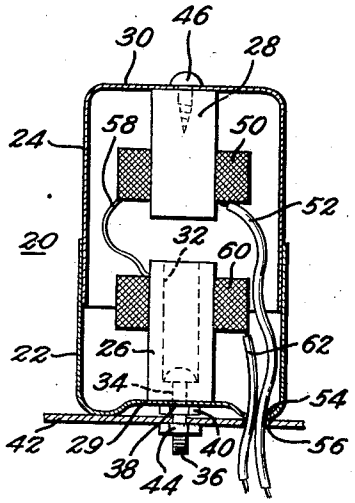

Fig. 1

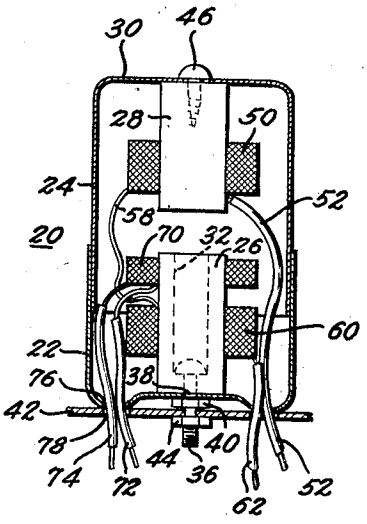

Fig. 2

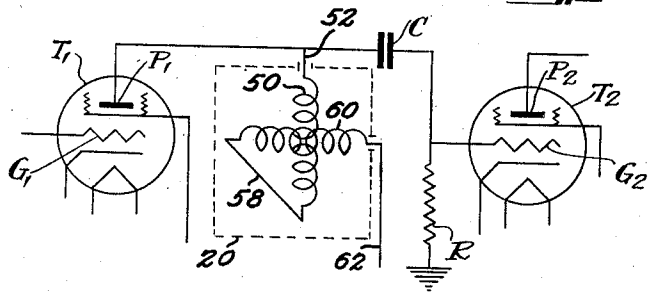

Fig. 3

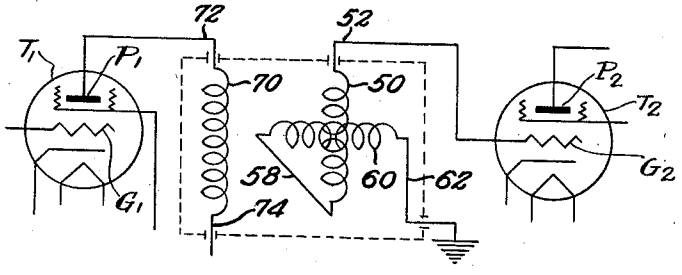

Fig. 4

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VARIOMETER

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Application September 23, 1932, Serial No. 634,512

2 Claims. (Cl. 171—119)

This invention relates to a coupling unit in connection with radio receiver mechanism.

An object of this invention is to provide a coupling unit of compact form and which will permit of ready adjustment to meet the conditions of its adaptation. This has been accomplished by providing a pair of adjustable supports each of which independently carries a coil element of the coupling unit so that the relative positions of the coils may be varied.

A further object of the invention is to provide the shielded coupling unit including a transformer so that coupling of the contributing coils thereof may be altered yet maintain perfect shielding of the complete unit. This has been accomplished by constructing the shield means so as to have overlapping portions of considerable extent so that when the contributing coils of the transformer are mounted one upon each portion of the shielding means, that the same may be adjusted throughout their range without disruption of the mechanical connection of said shielding means.

Another object of the invention is to provide a variable coupler of simplified construction and of efficient operation. This has been accomplished by providing independent supports for a fixed coil and a movable coil and a cup like shield member for each, the shield members being telescopically engageable throughout a definite range of positions whereby the proximity of the coils may be controlled.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawing wherein a preferred embodiment of one form of the present invention is clearly shown.

In the drawing:

Fig. 1 illustrates in section a physical embodiment of the improved coupling unit hereinafter to be described.

Fig. 2 is a similar illustration of another form of coupling unit involving the instant invention.

Fig. 3 is a circuit diagram illustrative of the adaptation of the invention as disclosed in Fig. 1 to a radio circuit.

Fig. 4 is a circuit diagram illustrating an adaptation of the coupling unit illustrated in Fig. 2.

Referring particularly to the drawing 20 refers to my improved coupling unit and comprises a pair of telescoping members, which for the convenience of description, will be identified as a cup 22 and a cap 24, each of which has secured thereto a dielectric form or coil support 26 and 28 respectively. It is preferred that the members 22 and 24 be cylindrical in cross section though if desired they may be of other contour, but for the purpose of effecting the instant invention should have the head members 29 and 30. The coil supporting member 26 may be wood, fibre or other equivalent material in cylindrical form and is provided with a longitudinal bore or recess 32 terminating in a smaller bore 34 which makes for the reception and passage of a bolt 36 as illustrated in the drawing.

The head member 29 of the cup 22 is provided with an aperture 38 at the center thereof through which passes the bolt 36 and when a nut 40 is applied thereto operates to secure the coil form to the head 29 of the cup at the central axis thereof. The bolt 36 is of sufficient length to be passed through an aperture of a chassis or frame member 42 and receive an additional nut 44 by which the coupling unit may be mounted wherever desired. The coil form 28 is constructed of similar material to that of the form 26 and is secured to the head member 30 of the cap 24 by means of a screw 46 driven through the head member 30 into the body of the coil form as appears in dotted lines in Fig. 1.

The construction of the coupling unit thus far described is identical for both of the forms that are illustrated in Figs. 1 and 2, and hence like reference characters have been applied to similar parts appearing in both figures. Referring again to the construction in Fig. 1 coil windings are mounted on each of the coil forms 26 and 28 which may be accomplished in any desired means as by winding the coils and cementing them thereon in their proper place, or if so desired the coil forms 26 and 28 may be used as mandrels upon which the desired coils are wound to satisfy the predetermined constants.

Referring again to Fig. 1 a coil 50 is secured to the form 28 carried by the cap 24 and has its lead 52 trailed out to pass through an aperture 54 of the cup 22 and through an aperture 56 of the chassis member 42 where the lead 52 may be connected into the desired circuit. A second lead 58 is provided for interconnecting with a second coil 60 mounted upon the coil form 26 and which has provision for connecting with the exterior circuit by means of a lead 62. Inasmuch as these same coils 50 and 60 with their associated connections are also to be found in the embodiment illustrated in Fig. 2 the same reference characters have been applied thereto. With respect to these two forms of the invention, there exists the

difference that the coil **60** instead of being mounted near the end of the coil form **26** as illustrated in Fig. 1 is secured at about the mid-point thereof, or at least sufficiently removed from the free end of the form **26** to permit the mounting of a third coil **70** as illustrated in Fig. 2. In this instance the coil **70** provides leads **72** and **74** that are passed through aligned apertures **76** and **78** in the head member **29** and the chassis member **42** respectively, from whence the leads **72** and **74** may be connected into the external circuit.

In Figure 3 two cascaded tubes T_1, T_2 are shown. Tube T_1 is provided with an anode P_1 which is connected through the variable devices **20**, **50**, **60** to the conductor **62**. The anode P_1 is also connected to grid G_2 of the tube T_2 through a condenser C. A resistance R is connected between the grid G_2 and ground. It will be seen that the coupling in Figure 3 corresponds to the arrangement shown in Figure 1 wherein the windings **50** and **60** are adjustably disposed with respect to one another.

In Figure 4 the two tubes T_1 and T_2 are cascaded through the means comprising the windings **70** and windings **50** and **60**. This arrangement corresponds to the arrangement shown in Figure 2 wherein the coils **50** and **60** are again adjustably disposed with respect to one another.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a system wherein a pair of cascaded electronic tubes is arranged so that the output of one of the tubes is coupled to the input of the other by means of a primary coil and a secondary coil one of said coils being wound in two sections, in combination a metallic shield made up of a pair of telescopically engaging members, a core member mounted within one of said shielding members, said core member having mounted thereon one of said coil sections and the other coil, a second core member mounted within the other of said shielding members said second core member having mounted thereon the other coil section, said telescopically engaging members providing means for varying the proximity of the coils mounted on the one support with respect to the coil mounted on the other support.

2. In a system wherein a pair of cascaded electronic tubes is arranged so that the output of one of the tubes is coupled to the input of the other, a primary coil associated with the ouput of the first tube and a secondary coil associated with the input of the second tube said secondary coil being wound in two sections the two sections being connected to each other by means of a flexible conductor, a metallic shield made up of a pair of telescopically engaging members, a core member mounted within one of said shielding members said core member having mounted thereon the primary coil and one of the sections of said secondary coil a second core member mounted within the other of said shielding members said second core member having mounted thereon the other section of the secondary coil, said telescopically engaging members providing means for varying the proximity of the primary coil and the section of the secondary mounted on the same support therewith with respect to the section of the secondary coil mounted on the other support whereby a variation in coupling between the output of the first tube and the input of the second tube may be obtained while insuring complete shielding for the coupling system.

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