Jan. 10, 1933. H. C. FORBES 1,893,618

COUPLING DEVICE

Filed June 5, 1931

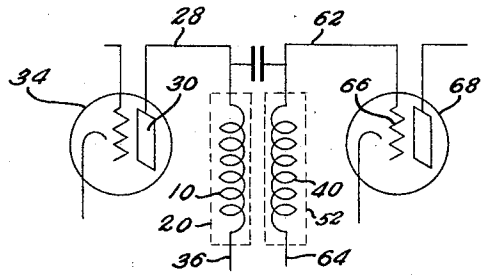


Fig. 1.

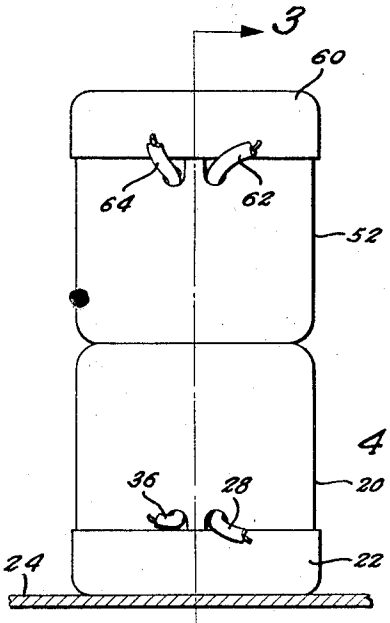


Fig. 2.

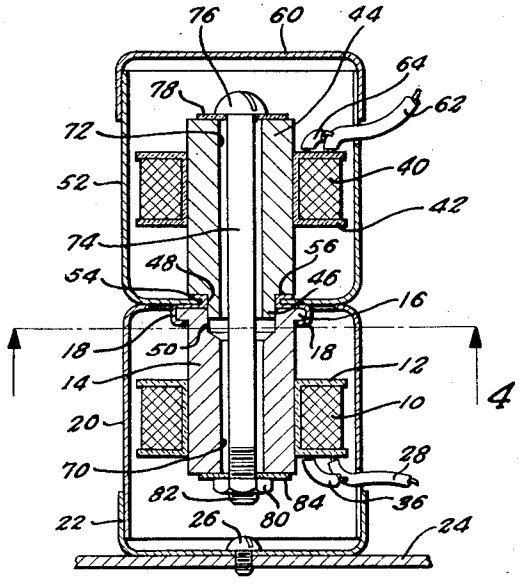


Fig. 3.

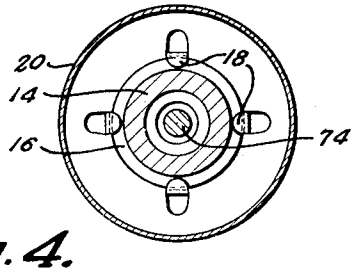


Fig. 4.

Inventor

Henry C. Forbes

By Spencer, Hardman & Fehr

His Attorneys

Patented Jan. 10, 1933 1,893,618

UNITED STATES PATENT OFFICE

HENRY C. FORBES, OF DAYTON, OHIO, ASSIGNOR TO GENERAL MOTORS RADIO CORPORATION, OF DAYTON, OHIO, A CORPORATION OF OHIO

COUPLING DEVICE

Application filed June 5, 1931. Serial No. 542,291.

This invention relates to a coupling unit, and in more particular to a capacity coupling connecting a pair of shielded inductances.

An object of this invention is to provide a capacity coupling for coupling a pair of shielded inductances that does not require the usual form of fixed condenser.

Another object of this invention is to provide unitary shields for the coils that are attached to each other so as to minimize on the amount of room, and simplify the structure without sacrificing the performance.

Another object is to provide a fastening device for clamping the parts of the coupling assembly in a relatively fixed relation. This has been accomplished by providing a clamping member that cooperates with the cores of the coils, thereby holding the cores in a relatively fixed position.

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:

Figure 1 discloses a schematic wiring diagram for coupling the plate circuit of one tube to the grid circuit of another;

Figure 2 shows a plan view of the coupling system;

Figure 3 discloses a sectional view taken substantially on the line 3—3 of Figure 2; and

Figure 4 shows a sectional view taken substantially on the line 4—4 of Figure 3.

The coil 10 mounted upon a suitable insulating support 12 is carried by a spool, or support 14, provided with a flange 16 that is gripped by the tongues 18, struck out of the insulating shield 20, telescopically engaging a cup-shaped member 22 attached to the base of the radio receiver 24 by a screw 26. One terminal 28 of the coil 10 may be connected to the plate 30 of the tube 34 and the other terminal 36 to a suitable source of B potential (not shown).

The coil 40 supported by the insulating support 12 is carried by a spool, or support 44, provided with a reduced portion 46 passing through an aperture 48 in the shield 20 and telescopically engaging a recess 50 provided therefor in the spool 14. The coil 40 is enclosed in a shield 52 provided with an aperture 54 and held in position by flaring the edge 56 of the shielding member 20. A suitable cup-shaped cover 60 fits over the shield 52 so as to completely shield the coil 40. The terminals 62 and 64 may be connected in the grid circuit including the grid 66 of the tube 68.

The spools 14 and 44 have been provided with apertures 70 and 72 through which passes a metallic fastening member 74, provided with a head 76 that engages a washer 78 and a nut 80 threadedly engaging the end 82, spaced with respect to the spool 14 by a washer 84. It can be readily seen that upon the tightening of the nut 80 the spools 44 and 14, and the shields 20 and 52 will be held or clamped in a relatively fixed position.

For high frequency currents such as radio frequency currents the metallic fastening member 74 is preferably made from a non-magnetic material so as to have substantially the same permeability as that of air. As is well known to those skilled in that art, a capacity coupling exists between the coil 10 and the metallic fastening member 74, and the metallic member 74 and the coil 40, so that in effect the metallic member 74 acts as an intermediate plate of a condenser having the coil 10 as one plate and the coil 40 as another plate. By this coupling assembly the anode circuit, including the plate 30, may be coupled to the grid circuit including the grid 66.

The capacity coupling thus formed between the coil 10 and the coil 40 is dependent upon the size of the coils, and the size, shape and material of the fastening member 74, and the washers 78 and 84.

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. A coupling unit comprising in combi-

nation, a pair of coils having no inductive coupling, and a conducting member electrostatically associated with each of said coils whereby the coils have a capacity coupling.

2. A coupling unit comprising in combination, a pair of coils having no inductive coupling, said coils being axially aligned, and a conducting member electrostatically associated with each of said coils so as to electrostatically couple said coils.

3. A coupling unit comprising in combination, a pair of coils, a shield for each of said coils for shielding the coils, and a conducting member electrostatically associated with each of said coils, said conducting member extending from one shield into the other whereby the coils are coupled electrostatically.

4. A coupling unit comprising in combination, a pair of coils, a shield enclosing one of said coils, a second shield attached to said first shield, said second shield enclosing said second coil, and a conducting member electrostatically associated with each of said coils, said conducting member extending through a common opening provided therefor in said shields, whereby said coils are coupled electrostatically.

5. A coupling unit comprising in combination, a pair of shielded coils, said coils being substantially shielded from each other, and a conducting member passing through the axis of each of said coils whereby said coils are coupled electrostatically.

6. A coupling assembly including a pair of coils, metallic shields for each of said coils, said shields being joined and having a common aperture, a support carried by one of said shields and having an aperture aligned with said common aperture, said support carrying one of said coils, a second support having an aperture aligned with said common aperture, said second support carrying the other coil, and a conducting member extending through said aperture for electrostatically coupling said coils.

7. A coupling assembly including a pair of shielded coils, a supporting member having an aperture, said supporting member carrying one of said coils, a second supporting member having an aperture aligned with the aperture in the first supporting member, said second member carrying the other coil, and a metallic fastening member passing through said apertures for holding the supports and the coils mounted thereon in a relatively fixed relation, said fastening member coupling said coils electrostatically.

8. A coupling assembly including a pair of coils, a pair of shields for shielding said coils from one another, a pair of supports each carrying a coil, said supports being mounted in their respective shields and a metallic fastening and coupling member passing through said shields, said fastening member holding the coils in a relatively fixed relation and coupling said coils electrostatically.

9. A coupling assembly including a pair of shields, each of said shields having an aperture aligned with an aperture in the other, a coil and a support therefor mounted in one of said shields, a second coil and a support therefor mounted in the second shield, a metallic fastening member passing through said apertures, said fastening member cooperating with said supports to clamp the assembly in a relatively fixed relation and electrostatically coupling said coils whereby undulating currents carried by one of the coils generate currents in the other coil.

10. A coupling assembly for coupling a pair of circuits, said assembly including a pair of coils, said coils each being connected in a circuit, a pair of shields for shielding each of said coils, and a metallic member insulatingly supported passing from one shield into the other, said metallic member coupling said coils whereby varying voltages carried by one of said circuits generates voltages in the other circuit.

11. A coupling assembly including a pair of coils, said coils each being connected in a circuit, a pair of shields for shielding each of said coils, a pair of aligned cylindrical supports each mounted in a shield and each carrying a coil, one of said supports having an aperture aligned with an aperture in the other, and a cylindrical conducting member passing through said apertures for coupling said circuits electrostatically whereby varying currents carried by one of said circuits is transmitted to the other circuit.

In testimony whereof I hereto affix my signature.

HENRY C. FORBES.