Feb. 9, 1926. 1,572,688

W. B. SCHOEPPLER

THREE-CIRCUIT COUPLER

Filed July 17, 1924

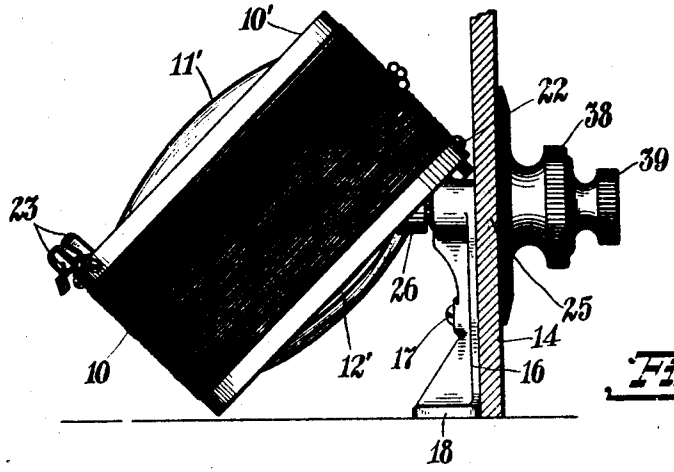


Fig. 1.

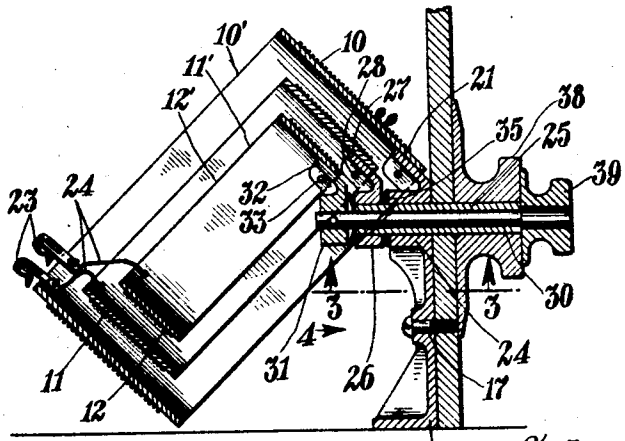


Fig. 2.

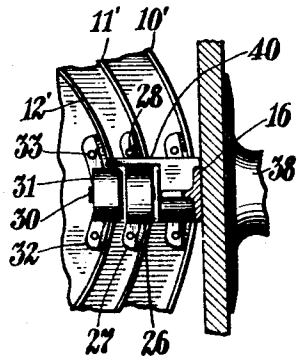


Fig. 3.

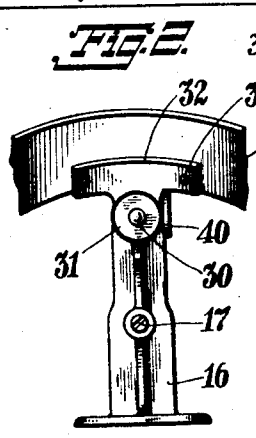


Fig. 4.

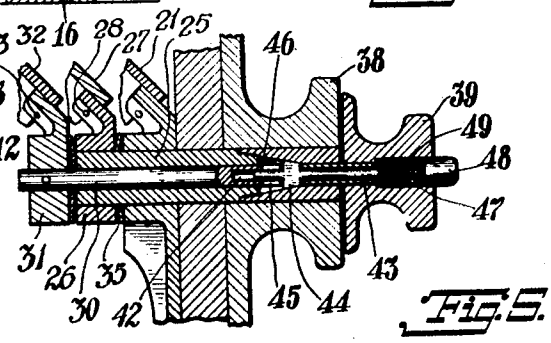


Fig. 5.

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UNITED STATES PATENT OFFICE.

WALTER B. SCHOEPPLER, OF NEW YORK, N. Y.

THREE-CIRCUIT COUPLER.

Application filed July 17, 1924. Serial No. 726,467.

To all whom it may concern:

Be it known that I, WALTER B. SCHOEPPLER, citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Three-Circuit Couplers, of which the following is a specification.

This invention relates generally to radio apparatus, having more particular reference to a novel variable coupler which is inserted between the antenna and the detector circuit in a radio receiver, and which I term a three circuit coupler.

The invention has for an object to provide a variable coupler which is more sensitive than those now in use and which will permit of greater selectivity in receiving.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

Fig. 1 of the drawing is a side view of my improved variable coupler showing it in position on the panel of a receiving set.

Fig. 2 is an axial vertical sectional view of the coupler.

Fig. 3 is a fragmentary horizontal sectional view taken on the line 3–3 of Fig. 2.

Fig. 4 is a fragmentary elevational view looking in the direction of the arrow 4 in Fig. 2.

Fig. 5 is a detail sectional view showing a modified means for releasably connecting the two variable coil supports together.

As here embodied my improved coupler comprises three coils arranged concentric to one another, these coils being indicated at 10, 11 and 12, respectively and being wound on the short tubes or rings 10′, 11′ and 12′, which rings may be made of fibre or like insulating material. These tubes are undercut, or formed with shallow circumferential grooves as shown to receive the coils and prevent displacement thereof. These rings or tubes are adapted to be mounted on the panel board of the receiver, which panel board is indicated at 14, with their common axis obliquely inclined with respect to the said panel board, preferably at an angle of forty-five degrees. Fixed to this panel board is a bracket 16 which may be secured to the panel board by a screw 17 passing therethrough, and which may be formed with an enlarged foot 18 which may engage the floor of the receiver casing. This bracket 16 is formed with an arcuate top element 21 which projects at an oblique angle therefrom and to which the ring 10′ of the fixed coil 10 is secured as by the screws 22. This ring 10′ may have a number of clips 23 fixed thereto to receive the usual circuit leads, connections 24 from the inner coils leading to these clips.

This bracket 16 is formed with a horizontal aperture 24 through which extends a hollow spindle 25, which extends also through the panel board 14 and which has fixed on its inner end a short arm comprising a collar 26 from which projects an arcuate member 27 which engages inside the ring 11 of the intermediate coil and is fastened to the edge of said ring by screws such as 28. Extending freely through this hollow spindle is a solid spindle or rod 30 which has a short arm fixed to its inner end, the rod projecting at both ends beyond the hollow spindle. This short arm on the rod is formed by a collar 31 encircling the rod and having an arcuate member 32 projecting obliquely therefrom and engaging inside the inner ring 12′ to one edge of which, it is secured as by the screws 33. To cause the rings 11′ and 12′ to remain in the position to which they may be adjusted spring washers 35 are preferably interposed between the bracket 16 and hub 26, and between the latter and the hub 31. As will be apparent, rotation of either the spindle 25 or the rod 30 will cause the corresponding coil 11 or 12 to be tilted with respect to the fixed coil 10 and the inductance thereby varied. The spindle 25 is provided with an ordinary knob 38 at its outer end while the rod is also provided on its projecting outer end with a knob or handle 39. The bracket 16 is formed with a finger 40 which projects therefrom parallel to the axis of the spindle 25 and which is adapted to be engaged by the coil supporting arms on the spindle and rod to limit rotary movement of said rod and spindle.

In order to cause the rod 30 to rotate normally in unison with the spindle 25, while permitting ready loosening of the rod with respect to the spindle, I may provide the following novel frictional connection between the spindle and rod. The rod 30 is formed with an axial boring 42 entered

therein from the outer end thereof, in which is slidable a plunger pin 43 which has projecting from its inner end portion a pair of fins 44 which extend through longitudinal slots 45 in the rod 30 and engage in a frusto-conical recess 46 in the hollow spindle 25. These fins are normally pressed against the inclined wall of the said recess by means of an expansion spring 47 which bears against a knob or head 48 on the outer end of the pin 43, this spring being located in a socket 49 in the knob 39. It will be obvious that by pushing the pin 43 inward the fins 44 are loosened from their gripping action on the hollow spindle 25, permitting the rod to be rotated freely in said spindle to adjust the inner coil 12.

The fixed coil 10 is the primary coil and may be provided with eight unit and eight group taps, while the intermediate coil 11 constitutes the secondary, and the inner coil a tickler. In the winding these coils the number of turns of wire on each coil is directly proportioned according to the wave length desired.

I have found that by means of my improved variable coupler the receiver is made more sensitive, and can be adjusted with greater selectivity to different stations.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent of the United States is as follows:—

1. In a radio set, a frame element including a bracket, a fixed coupler coil mounted on said bracket, a hollow spindle rotatably mounted in said bracket, an adjustable coil fixed on one end of said spindle and positioned within the said fixed coil, a rod extending freely through the said hollow spindle, and a second adjustable coil fixed on one end of said rod and positioned within the first mentioned adjustable coil, and a releasable friction device preventing relative rotation of said rod and spindle.

2. In a radio set, a frame element including a bracket, a fixed coupler coil mounted on said bracket, a hollow spindle rotatably mounted in said bracket, an adjustable coil fixed on one end of said spindle and positioned within the said fixed coil, a rod extending freely through the said hollow spindle, and a second adjustable coil fixed on one end of said rod and positioned within the first mentioned adjustable coil, and a releasable friction device preventing relative rotation of said rod and spindle, said friction device comprising a pin slidable in an axial boring in said rod and formed on its inner end with a laterally projecting fin projecting into a frusto-conical recess in the hollow spindle, and a spring bearing on said pin to hold the latter in position with the fin thereon wedged against the wall of the said recess.

3. In a radio set, a bracket, a fixed coupler coil mounted in said bracket, a hollow spindle rotatably mounted in said bracket, an adjustable coil fixed on one end of said spindle and positioned within said fixed coil, a rod extending freely through said hollow spindle, and a second adjustable coil fixed on one end of said rod and positioned within said first mentioned adjustable coil, said first named coil constituting the primary coil, the intermediate coil constituting the secondary coil, and the inner coil constituting a tickler, and a releasable friction device for preventing relative rotation of said rod and spindle, said device comprising a pin in said rod, fins on said pin engaging said spindle, and a means bearing on said pin for holding it in position with the fins wedged in said spindle.

4. In a radio set, a bracket, a fixed primary coupler coil mounted on said bracket, a hollow spindle rotatably mounted in said bracket, having a frusto-conical recess, a knob on said spindle, and an adjustable secondary coil fixed on one end of said spindle, and positioned within said fixed coil, a rod extending freely through the said hollow spindle having an axial bore and longitudinal slots, a knob on the projecting outer end of said rod having a socket formed therein, a second adjustable coil constituting a tickler fixed on one end of said rod, and positioned within the first mentioned adjustable coil, a plunger pin slidable in the axial bore of said rod, a head on said pin, a pair of fins projecting from the inner end portion of said pin and extending through the longitudinal slots of said rod, said fins adapted to engage the frusto-conical recess in said spindle, an expansion spring within the socket of said rod knob, bearing against the head on said pin for pressing said fins against the inclined wall of the frusto-conical recess for normally allowing a rotation of said rod with said spindle, permitting an inward movement of said pin to allow the rod to freely rotate in said spindle to adjust the inner coil.

In testimony whereof I have affixed my signature.

WALTER B. SCHOEPPLER.