Mar. 3, 1925. 1,528,686

J. NEUMANN

TUNING UNIT OF RADIOPHONE APPARATUS

Filed April 5, 1924

Fig. 1

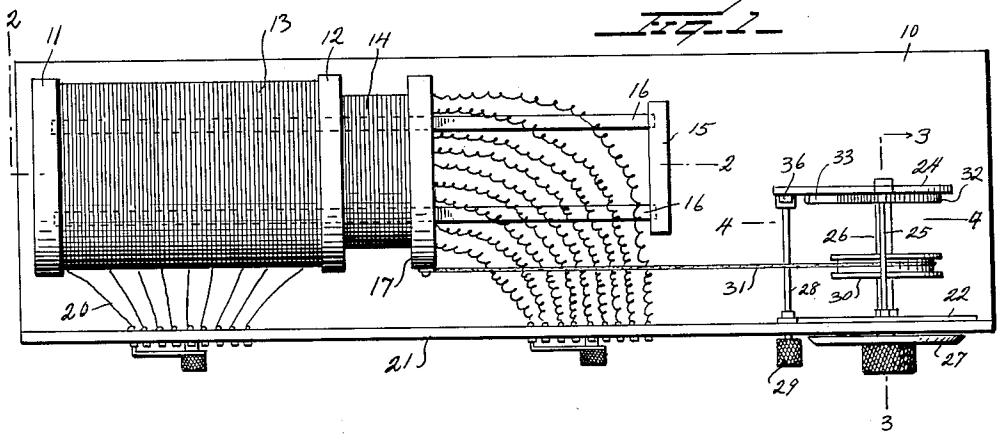


Fig. 2

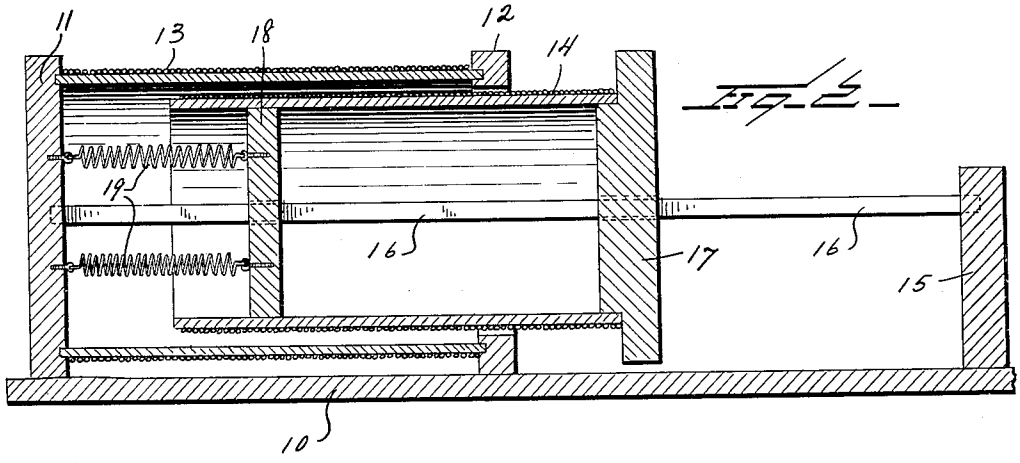


Fig. 4

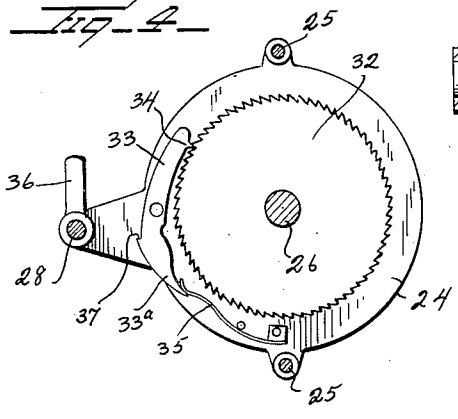
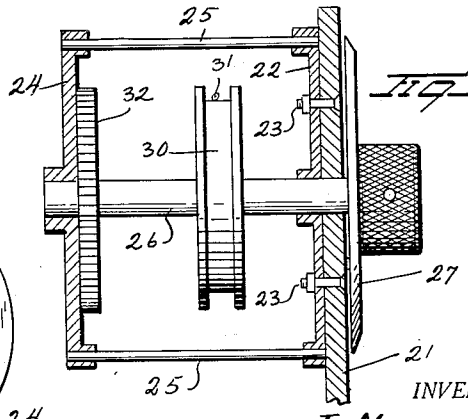


Fig. 3



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Patented Mar. 3, 1925. 1,528,686

UNITED STATES PATENT OFFICE.

JOSEPH NEUMANN, OF ST. LOUIS, MISSOURI.

TUNING UNIT OF RADIOPHONE APPARATUS.

Application filed April 5, 1924. Serial No. 704,468.

To all whom it may concern:

Be it known that I, JOSEPH NEUMANN, a citizen of the United States, residing at St. Louis, and State of Missouri, have invented certain new and useful Improvements in Tuning Units of Radiophone Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to improvements in the tuning units of radiophone apparatus and more particularly to improvements in that type of tuning unit generally referred to as loose coupler and consisting of concentrically disposed primary and secondary coils, the secondary being axially shiftable to vary its coupling with the primary.

An important object of the invention is to provide in combination with a coil of this character means for controlling the position of the coil which may be disposed at the opposite side of the panel from the coil, thus allowing the coil to be enclosed within a cabinet where it is protected from dust, dirt and the like.

A further object of the invention is to provide apparatus of this character whereby the coil may be locked in any desired adjusted position and when released will return to the full coupled position.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a plan view of a tuning unit constructed in accordance with my invention;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a section on the line 4—4 of Figure 1.

Referring now more particularly to the drawings, the numeral 10 indicates a suitable base upon which are arranged suitable standards 11 and 12 between which is mounted the primary winding 13 of a loose coupler which, as well known to those familiar with the art, consists of a tube upon which wire is wound. The standard 12 is provided with an opening through which a secondary coil 14 may be introduced to the primary coil.

In accordance with my invention I provide a lead support 15 aligned with the supports 11 and 12 and arranged at the opposite side of the support 12 from the support 11. Between the supports 11 and 15 extend guide rods 16 upon which are mounted forms 17 and 18 upon which the secondary coil 14 is mounted, these forms 17 and 18 being slidable upon the rods and secured to the coil. The form 18 is preferably arranged interiorly of the secondary coil adjacent that end thereof which first enters the primary coil and has secured thereto the outer ends of a pair of springs 19 the opposite ends of which are secured to the standard 11 within the primary coil 13. These springs tend to move the secondary coil to a position where it is completely housed within the primary coil and to what is known as the full coupled position. Either the primary or secondary coil may be provided with taps 20 or both thereof so provided as generally indicated in the drawings. When the taps are employed with the secondary coil, these should be constructed from flexible wire. The standards 11, 12 and 15 are arranged upon a line substantially paralleling the panel 21 behind which the apparatus is arranged.

The numeral 22 designates a plate rigidly supported in parallel relation to the panel and immediately at the back of the panel, the support preferably consisting of screws extending through the plate and panel as indicated at 23. In spaced relation to this plate 22 is a second plate 24 maintained in parallel relation to the plate 22 by spacing rods 25. Directed through the plates 22 and 24 and through the panel 21 is a shaft 26 provided at its outer end with an operating knob or dial 27. Likewise directed through the plates 22 and 24 is a second shaft 28 which is provided upon the face of the panel with an operating knob 29. The shaft 26 has secured thereto a spool 30 upon which is adapted to be wound a flexible element 31 which is connected to the outer secondary coil form 17 as indicated. It will be obvious that by rotating the shaft 26 through the knob 27 the coil 14 may be withdrawn from the coil 13 against the action of the springs 19.

The shaft 26 adjacent the plate 24 has secured thereto a finely toothed ratchet wheel 32. Pivoted upon the plate 24 adjacent this wheel is a pawl 33, the center of the pawl approximately aligning horizontally with the shaft 28. The upper end of this pawl is provided with a lug 34 coacting

with the ratchet teeth of the wheel 32 and the opposite end of this pawl is forced outwardly from the periphery of the wheel by means of a spring 35 so that normally the ratchet wheel and shaft to which it is secured can only be rotated in one direction and will be locked against return movement by the pawl. The shaft 28 has secured thereto a release arm 36 which engages the pawl primarily at a point approximately aligned with its pivot and in its downward swing forces the tail end 33ª of the pawl inwardly toward the periphery of the wheel thus disengaging the tooth 34. When the tooth is fully disengaged movement of the release arm 36 is limited by a shoulder 37 formed upon the engaged face of the pawl and this shoulder serves to support the arm so that the device may be left in the released position if so desired. While the pawl is in the released position the shaft 26 may, of course, be rotated in either direction until a desired tuning point is arrived at and it may then be locked against rotation by simply operating the shaft 28 to withdraw the release arm 36 and permit the pawl to engage with the wheel 32.

It will furthermore be obvious that when the use of the set is discontinued temporarily, it is very easy to release the secondary coil and permit the springs 19 to withdraw the same into the primary coil in which position the springs are not subjected to tension and accordingly do not tend to lose their elasticity as they would be were they under tension at all times. It will be obvious that the construction hereinbefore set forth is capable of a certain range of change and modification without in any manner departing from the spirit of my invention and I accordingly do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. The combination with a loose coupler including concentric primary and secondary windings, the secondary winding being shiftable axially of the primary winding, of means yieldably maintaining the secondary coil at one extreme of its coupling with the primary coil, means for moving the secondary coil toward the opposite extreme of its coupling against the action of the first named means including a rotatable shaft disposed at right angles to the axis of the coupler, means for rotating the shaft, means operated by the rotation of the shaft for moving the coil in such direction, and means for locking the shaft against rotation in one direction and permitting rotation of the shaft in the opposite direction.

2. The combination with a loose coupler including concentric primary and secondary windings, the secondary winding being shiftable axially of the primary winding, of means yieldably maintaining the secondary coil at one extreme of its coupling with the primary coil, means for moving the secondary coil toward the opposite extreme of its coupling against the action of the first named means including a rotatable shaft disposed at right angles to the axis of the coupler, means for rotating the shaft, means operated by the rotation of the shaft for moving the coil in such direction, means for locking the shaft against rotation in one direction and permitting rotation of the shaft in the opposite direction including a ratchet wheel secured to the shaft, a pawl coacting with the ratchet wheel and normally held in engagement therewith, and a trip for shifting said pawl out of engagement with the ratchet wheel.

3. The combination with a loose coupler including concentric primary and secondary windings, the secondary winding being shiftable axially of the primary winding, of means yieldably maintaining the secondary coil at one extreme of its coupling with the primary coil, means for moving the secondary coil toward the opposite extreme of its coupling against the action of the first named means including a rotatable shaft disposed at right angles to the axis of the coupler means for rotating the shaft, means operated by the rotation of the shaft for moving the coil in such direction, means for locking the shaft against rotation in one direction and permitting rotation of the shaft in the opposite direction including a ratchet wheel secured to the shaft, a pawl coacting with the ratchet wheel and normally held in engagement therewith, and a trip for shifting said pawl out of engagement with the ratchet wheel; said pawl including a shoulder limiting the movement of the trip, said trip frictionally maintaining its engagement with the pawl when moved into engagement with said shoulder.

In testimony whereof I hereunto affix my signature.

JOSEPH NEUMANN.