UNITED STATES PATENT OFFICE.

EDWARD L. COLBY, OF AUBURN, NEW YORK.

RECEIVING-TRANSFORMER FOR WIRELESS-TELEGRAPH SYSTEMS.

1,058,555. Specification of Letters Patent. Patented Apr. 8, 1913.

Application filed February 6, 1912. Serial No. 675,702.

To all whom it may concern:

Be it known that I, EDWARD L. COLBY, a citizen of the United States, residing at Auburn, in the county of Cayuga and State of New York, have invented new and useful Improvements in Receiving-Transformers for Wireless-Telegraph Systems, of which the following is a specification.

This invention relates to receiving transformers, loose couplers or inductive tuners adapted for wireless telegraph systems.

The primary object of the invention is the provision of an apparatus of this character which is of comparatively simple and inexpensive construction and so designed as to make extremely sharp tuning possible and capable of preventing interference, tuning up weak signals, and cutting out unwanted stations.

Another object of the invention is to provide a novel arrangement of primary and secondary windings inductively related and having means whereby the effective length of the windings can be changed, there being combined therewith a shiftable or adjustable winding of varying effective length which is connected in series with either the primary or secondary and adjustable back and forth axially with respect thereto for obtaining the desired inductive result between the primary and secondary windings under unusual conditions.

With such objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a perspective view of the receiving transformer, loose coupler or inductive tuner. Fig. 2 is a central longitudinal section thereof. Fig. 3 is a transverse section. Fig. 4 is an end view.

Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawing, 1 designates a tubular or other support for the primary and secondary windings P and S, respectively, which windings may be formed of insulated wire or bare wire having their adjacent convolutions and layers insulated in a well-known manner. The windings are arranged on the ends of the tube 1 and separated by an air space at 2 between their adjacent ends. With the primary winding coöperates a slider 3 movable back and forth on a supporting conductor 4, whereby the effective length of the primary winding may be changed. The secondary winding may also be provided with means for changing the effective length thereof such as a slider 5 movable back and forth on a supporting conductor 6, which supporting conductors 4 and 6 are preferably fastened to the heads or end pieces 7 and 8 of the tubular support 1. These heads are connected together by a pair of longitudinal rods 9 whereby a rigid structure is formed.

Means is provided within the tubular support 1 for changing the inductive relation of the primary and secondary windings, such means taking, in the present instance, the form of one or more coils or windings 10, 11, 12 and 13, mounted on a tubular body 14 that is slidable back and forth on the rods 9, said body 14 having a rod 15 connected therewith and extending out of an opening 16 of one of the end pieces or heads and having on its outer extremity a knob 17 of hard rubber or other insulating material, whereby the small winding within the transformer can be moved axially of the primary and secondary windings. This adjustable inner winding may be connected in series with either the primary or secondary, but in the present instance, it is shown connected by a flexible wire 18 with the primary winding. Flexible taps 10^a, 11^a, 12^a and 13^a lead from the coils 10, 11, 12 and 13, to contacts 10^b, 11^b, 12^b and 13^b on one of the end pieces or heads, and coöperating with these contacts is a switch arm 19 which can move back and forth over the contacts and thereby vary the effective length of the inner adjustable winding. Any other suitable means may be employed for effecting this change. The switch blade 19 forms one terminal of the primary winding, while the other terminal is the binding post 20. The binding posts of the secondary windings are shown at 21 and 22.

With a device of the character referred to, a large variety of inductive effects can be obtained by shifting the sliders 3 and 5 of the primary and secondary windings; by shifting the inner winding axially of the primary and secondary winding at the air gap between them; and by manipulating the switch

blade 19 so that it is possible to tune up weak signals to a considerable extent and otherwise give sharp tuning results.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim as new, is:—

1. An apparatus of the class described comprising primary and secondary windings arranged on a common axis with their adjacent ends separated by an air space, and an adjustable winding arranged in series with one of the first-mentioned windings and disposed within the latter.

2. An apparatus of the class described comprising primary and secondary windings arranged on a common axis with their adjacent ends separated by an air space, an adjustable winding arranged in series with one of the first-mentioned windings and disposed within the latter, and means for changing the effective length of the last-mentioned winding.

3. An apparatus of the class described comprising primary and secondary windings arranged on a common axis with their adjacent ends separated by an air space, means associated with each winding for changing the effective length thereof, an adjustable winding arranged in series with one of the first-mentioned windings and disposed within the latter, and means for changing the effective length of the last-mentioned winding.

4. An apparatus of the class described comprising a tubular support, a primary winding on one end thereof, a secondary winding on the other end, said windings having their inner ends separated by an air space, and a smaller winding arranged within the tubular support and adjustable longitudinally of the first-mentioned windings and connected in series with one of them.

5. An apparatus of the class described comprising a tubular support, a primary winding on one end thereof, a secondary winding on the other end, said windings having their inner ends separated by an air space, a smaller winding arranged within the tubular support and adjustable longitudinally of the first-mentioned windings and connected in series with one of them, and means for changing the effective length of the smaller winding.

6. An apparatus of the class described comprising a tube, end pieces, a rod extending through the tube, a coil movable back and forth on the rod, primary and secondary windings arranged on the tube with their inner ends separated by an air space, and a flexible connection between one of the windings and the said coil.

7. An apparatus of the class described comprising a tube, end pieces, parallel rods extending through the tube between the end pieces, a primary winding arranged on the tube adjacent one end, a secondary winding arranged on the tube adjacent the other end thereof, said windings being separated by an air space, a coil longitudinally movable upon said rods within the tube, a flexible connection between one of the windings and the said coil, said coil being divided into a series of portions, a multiple throw switch on one of said end pieces, and a flexible connection between each portion of said coil and one of the contact points of the switch.

8. An apparatus of the class described comprising a tube, end pieces supporting said tube, a pair of rods extending through the tube, a primary winding arranged on said tube adjacent one end, a secondary winding arranged on the tube adjacent the other end thereof and in spaced relation to the primary winding, a coil provided in its core with openings for the reception of said rods to slidably mount the same thereon, said coil being divided into a plurality of sections, means by which said coil may be adjusted within the tube, a flexible connection between one end of said coil and one of the said windings, a multiple throw switch secured to one of the end pieces, a flexible connection between each section of said coil and one of the contact points of said switch, and means by which the effective length of either one of said windings may be varied.

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD L. COLBY.

Witnesses:
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Fig. 1.

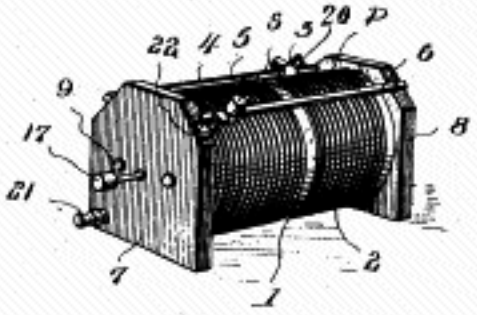


Fig. 2.

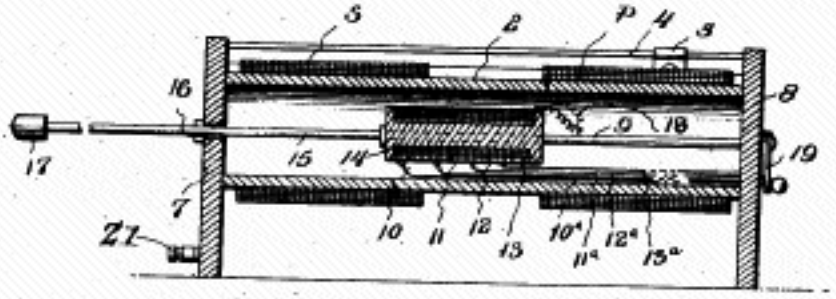


Fig. 3.

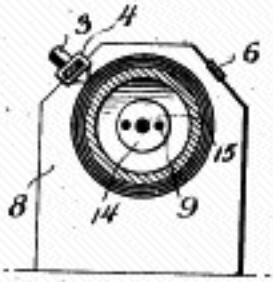
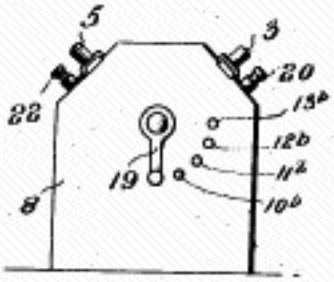


Fig. 4.



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