UNITED STATES PATENT OFFICE.

EDWARD L. COLBY, OF AUBURN, NEW YORK.

TRANSFORMER.

1,121,479. Specification of Letters Patent. Patented Dec. 15, 1914.

Application filed January 10, 1913. Serial No. 741,272.

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 Transformers, of which the following is a specification.

This invention relates to certain novel and useful improvements in wireless telegraph and telephone instruments and has particular application to what are commonly termed transformers, loose couplers or inductive tuners.

In carrying out the present invention, it is my purpose to provide an apparatus of the type set forth wherein the effective lengths of the windings may be changed and whereby any desired inductive result between the primary and the secondary windings may be had under unusual conditions.

It is also my purpose to provide a device of the class described which will embrace the desired features of simplicity, efficiency and durability coupled with cheapness of cost in manufacture and installation and which is so designed as to make extremely sharp tuning possible, and capable of preventing interference, tuning up weak signals, and cutting out unwanted stations.

Furthermore, I aim to provide a novel arrangement of primary and secondary windings inductively related and means whereby the inductive lengths of the windings may be changed, there being combined therewith a shiftable or adjustable winding of varying effective length which may be readily connected in series with either the primary or secondary and adjustable back and forth axially thereover for obtaining the desired inductive result between the primary and secondary windings under unusual conditions.

With the above and other objects in view, the invention consists in the construction, combination and arrangement of parts hereinafter set forth in and falling within the scope of the claims.

In the accompanying drawings; Figure 1 is a view in side elevation of a receiving transformer, loose coupler or inductive tuner. Fig. 2 is an end view thereof. Fig. 3 is a view of the opposite end. Fig. 4 is a central longitudinal sectional view thereof. Fig. 5 is a diagrammatic view of the windings of the transformer, loose coupler or inductive tuner, and Fig. 6 is a view of a detail of the invention.

Referring now to the accompanying drawings in detail, the numeral 1 designates a tubular or other support for the primary and secondary windings P and S respectively. These windings may be formed of insulated wire or bare wire or metal ribbon having their convolutions and layers insulated in a well known manner. The windings are arranged at the ends of the tube 1 and are separated by an air space at 2 between their adjacent or confronting ends. With the primary winding coöperates an arm 3 pivoted at one end on a supporting conductor 4 and movable in an arc over the convolutions or turns of the primary winding so that the effective length of such winding may be changed or varied, said supporting conductor 4 being provided with a binding post 4′ whereby the supporting conductor and the arm carried thereby are connected in series with the coil so that the aforementioned purpose may be accomplished. The secondary winding is also provided with means for changing the effective length thereof, such means, in the present instance, comprising an arm 5 pivoted at one end on a supporting conductor 6, the last-mentioned supporting conductor being equipped with a binding post 6′ by means of which said conductor and the arm thereon are in series with the secondary winding. The supporting conductors 4 and 6 are preferably fastened to the heads or end pieces 7, 8 of the tubular support 1.

Means is provided for changing the inductive relation of the primary and secondary windings. This means, in the present form of my invention, is in the form of a coil or winding 9 or a ring or hoop of metal mounted on a hollow tubular body 10 disposed concentrically of the body 1 and slidable back and forth thereon or axially thereof and movable over either the primary or secondary winding, in accordance with the conditions under which the device is used. This adjustable or slidable coil or winding is adapted to be connected in series with either the primary or secondary in accordance with the circumstances prevailing and means is provided whereby these connections may be interchanged readily and rapidly. In the present instance, each winding P, S has

connected in series therewith a spring jack 11 suitably fastened to the end wall or head 8 of the tubular support 1 and spaced apart in such manner as to form an arc, while between the confronting ends of the jacks is mounted a switch arm 12 having one end pivoted as at 13 to the head 8 and formed of two strips of metal insulated from each other, as shown in Fig. 5 so that when the switch arm is moved into engagement with one or the other of the jacks, the respective winding P, S will be placed in series with the adjustable winding or coil.

Secured to the hollow tubular body 10 and spanning the convolutions of the coil or winding 9 thereon is a supporting conductor 14 to which is pivoted one end of an arm 15 movable in an arc over the convolutions of the adjustable coil so as to vary the effective length thereof, a binding post 14' being carried by the supporting conductor 14 whereby the latter and the respective arm are connected in series with the adjustable winding or coil, as clearly illustrated in Fig. 5. Any other suitable means may be employed for effecting this change.

By means of a device of the character shown and described a large variety of inductive effects may be obtained by shifting the swinging arms of the primary and secondary windings, by shifting the adjustable or outer coil or winding axially of and over the primary and secondary winding; and by manipulating the arm 15 so that it is possible to tune up weak signals to a considerable extent and otherwise give sharp tuning results.

While I have herein shown and described one preferred form of my invention by way of illustration, I wish it to be understood that I do not limit or confine myself to the precise details of construction herein described and delineated, as modification and variation may be made within the scope of the claims and without departing from the spirit of the invention.

I claim:

1. An apparatus of the class described comprising a tubular support, primary and secondary windings on said support at the opposite ends thereof and separated by an air space, a hollow tubular body surrounding said tubular support concentrically thereof and of a width less than that of said support, a coil on said body, said body being movable over one or the other of said primary and secondary windings, means for changing the effective length of each of the first-mentioned windings, and adjustable means for connecting the last-mentioned winding in series with one or the other of the first windings.

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 adapted to be connected in series with one or the other of the first windings, and adjustable means for effecting such interchangeable connection.

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, an adjustable winding adapted to be connected in series with one or the other of the first windings, a spring jack connected in series with each of said first windings, and a switch arm composed of two strips of metal insulated from each other and connected with the opposite ends of said adjustable winding respectively and interchangeably associated with said jacks whereby said adjustable winding may be connected in series with either of the first windings.

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

EDWARD L. COLBY.

Witnesses:
LYNTON G. KELLEY,
EMORY HANLON.

E. L. COLBY.

TRANSFORMER.

APPLICATION FILED JAN. 10, 1913.

1,121,479.

Patented Dec. 15, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

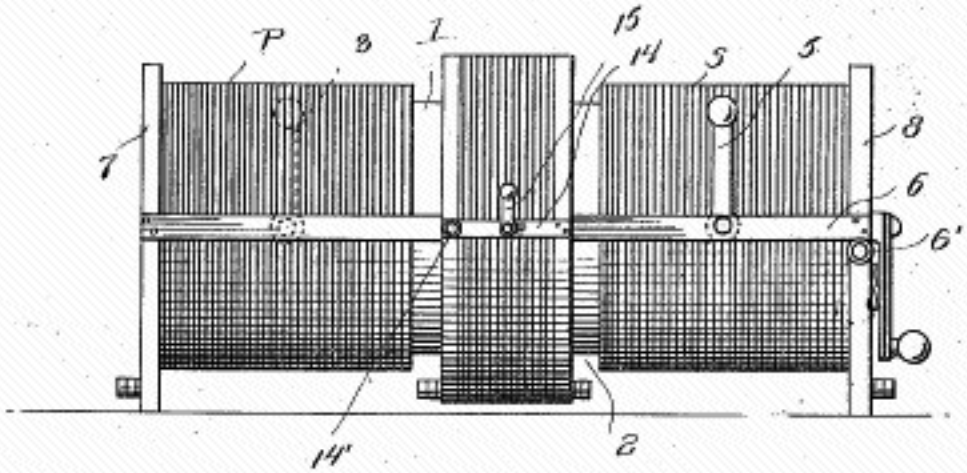


Fig. 2.

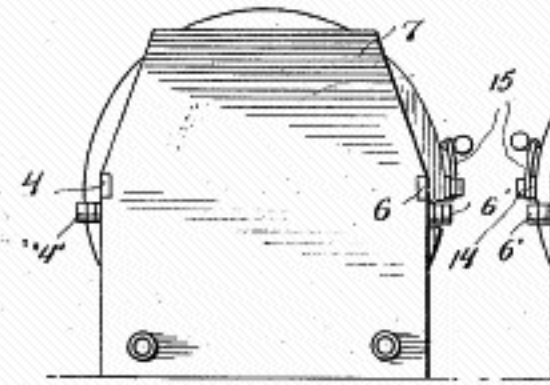
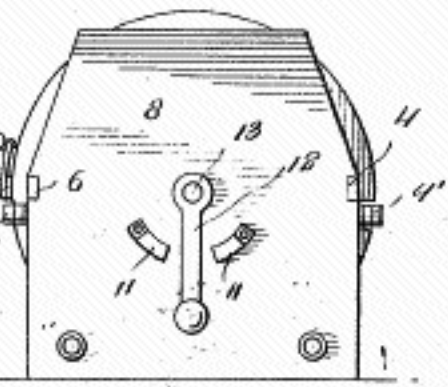


Fig. 3.



Inventor

Edward L. Colby.

Witnesses

William Smith.

John J. McCarthy.

By Victor J. Evans

Attorney