No. 886,302. PATENTED APR. 28, 1908.

W. W. MASSIE.

COMBINED TUNING COIL AND CONDENSER.

APPLICATION FILED APR. 3, 1907.

Fig. 1.

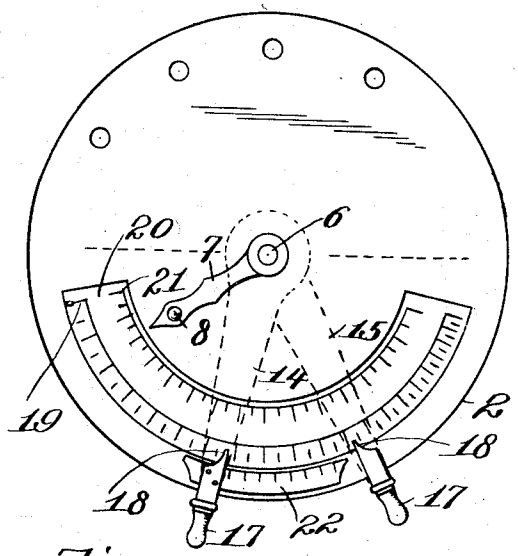


Fig. 2.

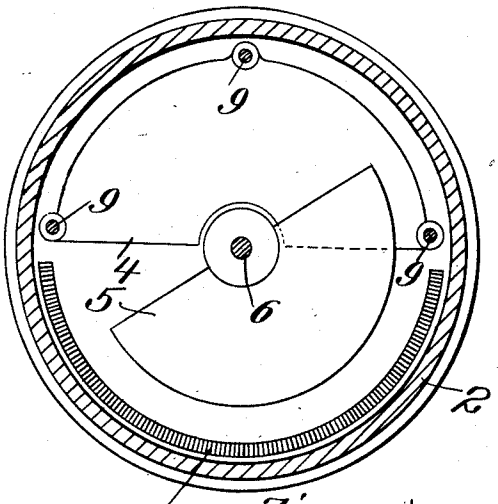


Fig. 3.

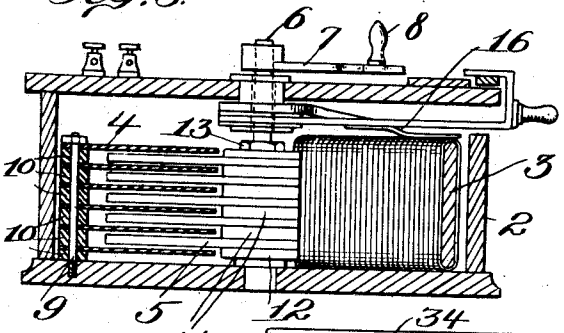


Fig. 5.

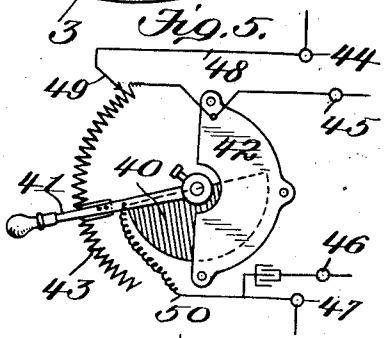
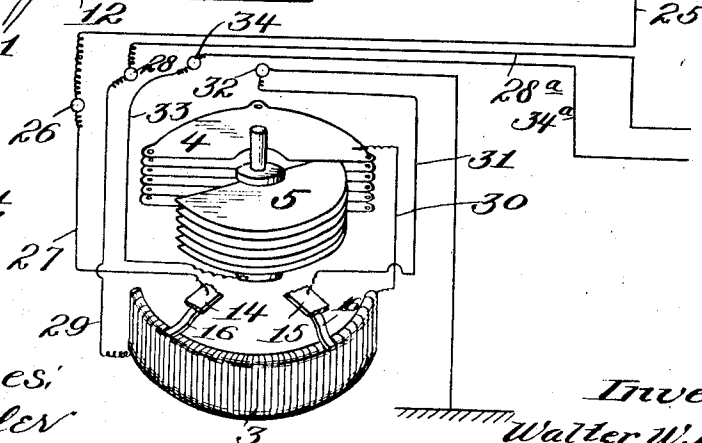


Fig. 4.



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UNITED STATES PATENT OFFICE.

WALTER W. MASSIE, OF PROVIDENCE, RHODE ISLAND, ASSIGNOR TO MASSIE WIRELESS TELEGRAPH CO., OF PROVIDENCE, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

COMBINED TUNING-COIL AND CONDENSER.

No. 886,302. Specification of Letters Patent. Patented April 28, 1908.

Application filed April 3, 1907. Serial No. 366,191.

To all whom it may concern:

Be it known that I, WALTER W. MASSIE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented new and useful Improvements in a Combined Tuning-Coil and Condenser, of which the following is a specification.

This invention relates to combined tuning coils and condensers.

A device involving my invention embodies a casing in which are contained an inductance coil and the elements of a condenser, by reason of which compactness is assured. I provide for the adjustment of the inductance and the condenser and instead of using sliding contact devices, I use swinging contact devices and insure in this way accuracy of adjustment. Where contact blocks are employed it is a difficult thing to slide them back and forth and if an attempt is made to move them a slight distance they are invariably pushed beyond the point desired by the power expended in starting them.

My combined tuning coil and condenser possess other advantages which with the foregoing will be set out at length in the following description, while the novelty of said invention will be included in the claims succeeding said description.

In the drawings accompanying and forming a part of this specification I show one form of embodiment of the invention which to enable those skilled in the art to practice said invention will be fully set forth in said description. Certain variations, however, may be adopted within the scope of my said claims.

Referring to the drawings, Figure 1 is a top plan view of a combined tuning coil and condenser including my invention. Fig. 2 is a horizontal section of said device and Fig. 3 is a cross section of the same. Fig. 4 is a diagrammatic view of a closed oscillatory receiving circuit provided with a combined tuning coil and condenser, such as is shown in Figs. 1, 2 and 3, said Fig. 4 also illustrating vertical and ground connections with the said circuit. Fig. 5 is a diagrammatic view of a modified form of combined tuning coil and condenser also involving my invention.

Like characters refer to like parts throughout the several figures.

The inductance and condenser elements of my device are mounted within a suitable casing which may be of any suitable material or shape. The casing shown is denoted in a general way by 2 and I find that I can make it satisfactorily of wood, while it is preferably made in cylindrical form in order to accommodate the inductance 3. The inductance is practically semi-circular and is contiguous to the inner surface of the wall or body of the casing 2. The cap of the casing I prefer to make removable so as to obtain ready access at any time to the interior of the casing. The inductance may be held fixedly within the casing in any desirable way and its top or upper surface is bared throughout the entire length thereof for engagement by adjustable contacts, as will hereinafter more particularly appear.

The condenser is composed of several superposed plates of semicircular form which are generally made from brass. The plates 4 are stationary in the casing while the plates 5 are revoluble, the plates 5 being fastened to a spindle or shaft 6 arranged perpendicularly of the casing and stepped at its lower end in the bottom of said casing. The spindle or shaft 6 extends upward through the top or cap of the casing and rigidly carries at its upper end the pointer 7 provided with a finger-piece 8 to secure the ready manipulation of the pointer and thereby of the plates 5 movable therewith. The plates 5 are covered with any suitable insulating material and they are moved into the spaces between the stationary plates 4 different distances to regulate capacity in the closed oscillatory circuit hereinafter described of which the condenser forms a part. The plates 4 may be held in the casing in any desirable way, for example, by screws, as 9, extended through perforations formed in the circular margins of the said plates 4 and tapped into the bottom of the casing 2, the screws being surrounded by washers or spacing elements 10 to hold the said plates 4 out of contact with each other and the desired distances apart and also to hold the lower one out of contact with the bottom of the casing. The washers 10 are of insulating material. Surrounding the spindle or shaft 6 are washers 11 separating the plates 5 from each other, the plates 5 and washers 11 being clamped against a shoulder 12 on said shaft by the nut 13, all as clearly represented in Fig. 3.

Surrounding and turnable upon the shaft 6 are the hubs of two contact levers 14 and 15,

each provided with a resilient member as 16 on the underside thereof to traverse the bared upper surface of the inductance 3. Each of the levers 14 and 15 is provided with a knob or finger piece as 17 whereby it may be easily operated. Upon the levers 14 and 15 are indexes or pointers as 18 adapted to traverse the graduations 19 upon the outer side of the scale 20, the pointer 7 to which I have hereinbefore referred being adapted to traverse the graduations 21 upon the inner side of said scale 20 fastened suitably to the top or cover of the casing 2. The lever 14 carries a scale 22. The outer ends of the two levers 14 and 15 are of substantially inverted L-shape, the horizontal branches of the two L portions being adapted to overhang the scale 20 and the scale 22 being carried upon the horizontal branches of the lever 14 as clearly shown in Figs. 1 and 2.

In Fig. 4 I have shown at 25 the so-called vertical of a wireless telegraphic system, the same extending to the contact 26 on the casing 2. From the contact 26 to the contact lever 14 the conductor 27 extends. From one end of the inductance 3 to the contact 28 the conductor 29 extends, while from the opposite end of said inductance the conductor 30 extends and is connected to the upper one of the stationary plates 4 and also to the contact lever 15 through a portion of the inductance. From the contact lever 15 there extends the conductor 31, said conductor constituting a ground connection and being intersected by the contact 32 on the top of the casing 2. From the bottom of the condenser there extends the conductor 33, said conductor running to the contact 34 on said casing top. The two contacts 28 and 34 are connected by conductors as 28^a and 34^a and a wave detector (not shown) with a suitable receiver, not shown. The receiver may be a telephone receiver or any other device suitable for receiving signals.

From the connections described it will be obvious that I provide a closed oscillatory receiving circuit in which are incorporated inductance and capacity, said circuit having vertical and ground connections. The capacity may be readily varied by turning the pointer 7 and the capacity will be indicated by the graduations 21, such graduations indicating micro-farads. The graduations 19 upon the outer side of said scale 20 and upon the scale 22 indicate milli-henrys and are for adjusting the inductance of the closed receiving circuit and vertical, respectively. In each series of graduations the zero mark is at the left thereof in Fig. 1. The lever 15 is moved toward and from the zero point on the graduations 19 for adjusting inductance in the closed circuit. The inductance in the vertical is read upon the scale 22 between the pointers 18. By the manipulation of the two levers 14 and 15 inductance in the closed receiving circuit and vertical can be readily and easily adjusted and the capacity in said receiving circuit can be similarly and easily effected by the operation of the pointer 7.

In Fig. 5 I have shown in diagram a slight modification of the combined tuning coil and condenser. The closed circuit including the condenser or capacity and inductance, which parts are shown in said Fig. 5, has means for obtaining a regulation of the inductance and capacity by a single lever. In this figure the movable plates 40 of the condenser are connected with and are movable by a lever 41, and said movable plates coöperate with the stationary plates 42, said movable and stationary plates being practically the same as those hereinbefore described in connection with the first form of condenser. It follows, therefore, that on the manipulation of the lever 41 the capacity can be regulated. The inductance 43 is of curved form and is concentric with the axis of motion of the lever 41 and the several condenser plates 40. The lever is equipped with a suitable spring contact arranged to traverse the bared portion of the inductance exactly as hereinbefore described. The condenser and inductance are incased in a box exactly as previously described and it is my custom to have this lever operate upon the upper side of the box, which upper side is also equipped with several binding posts as 44, 45, 46, and 47. The binding post 44 is connected with the aerial and by a connection as 48 with a lever as 49 also adapted to traverse the inductance 43. Ordinarily the lever 49 contacts with the inductance 43 at the extreme outer end thereof or what is in the figure the upper end thereof, as I find that I can satisfactorily use the lever 41 for simultaneously adjusting both inductance and capacity. To facilitate its operation the lever 41 may, as has been described in connection with the two levers 17, be equipped with a handle and the boxing may also be furnished with a scale coöperative with a pointer on said lever 41. I usually mount the lever 49 upon the under side of the boxing. The lever 41 is of metal construction so as to provide for its electric connection with the condenser and is connected by a connection as 50 to the binding post 47 which leads to ground. The binding posts 45 and 46 are connected with the receiver.

In both forms of the device hereinbefore described the inductance is of circular form and is concentric with the axis of motion of an adjusting lever which latter is adapted in one case to vary the inductance and, in the other, to vary both inductance and capacity. By virtue of the construction described I secure an exceedingly compact arrangement.

What I claim is:

1. In a device of the class described, a casing, an inductance coil in the casing,

and a condenser in the casing made up of superposed stationary and movable plates, the movable plates being adapted to expand into the spaces between the stationary plates, and a member for operating said movable plates, the inductance being substantially circular and approximately concentric with the axis of motion of the movable plates and being engageable by said operating member.

2. In a device of the class described, a casing, an inductance coil in the casing, a condenser in the casing made up of superposed stationary and movable plates, and a lever connected with the movable plates for simultaneously operating them all to carry them into and out of the spaces between the stationary plates, the inductance coil being substantially circular, approximately concentric with the axis of motion of the lever, and engageable by said lever.

3. In a device of the class described, a casing, an inductance coil in the casing, a condenser in the casing made up of superposed stationary and movable substantially semi-circular plates, the movable plates being adapted to enter the spaces between the stationary plates, and a lever connected with and for simultaneously operating all the movable plates, the inductance coil being substantially circular, approximately concentric with the axis of motion of the lever, and engageable by the latter.

4. In a device of the class described, an inductance coil, a condenser having movable plates, a lever for operating the movable plates to vary the capacity of the condenser, and a substantially circular inductance coil operatively associated with the condenser, approximately concentric with the axis of motion of and engageable by said lever.

5. In a device of the class described, the combination of capacity involving superposed plates, certain of which are movable, an inductance, and means for simultaneously moving the several movable plates to regulate the capacity and for simultaneously adjusting the inductance.

6. In a device of the class described, a condenser consisting of superposed stationary and movable plates, the movable plates being adapted to extend into the spaces between the stationary plates, an inductance coil substantially circular and concentric with the axis of movement of the movable plates, and means for operating said movable plates to regulate the capacity and for simultaneously adjusting the inductance coil.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WALTER W. MASSIE.

Witnesses:
FRANKLIN D. FORD,
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