

Sept. 6, 1932.

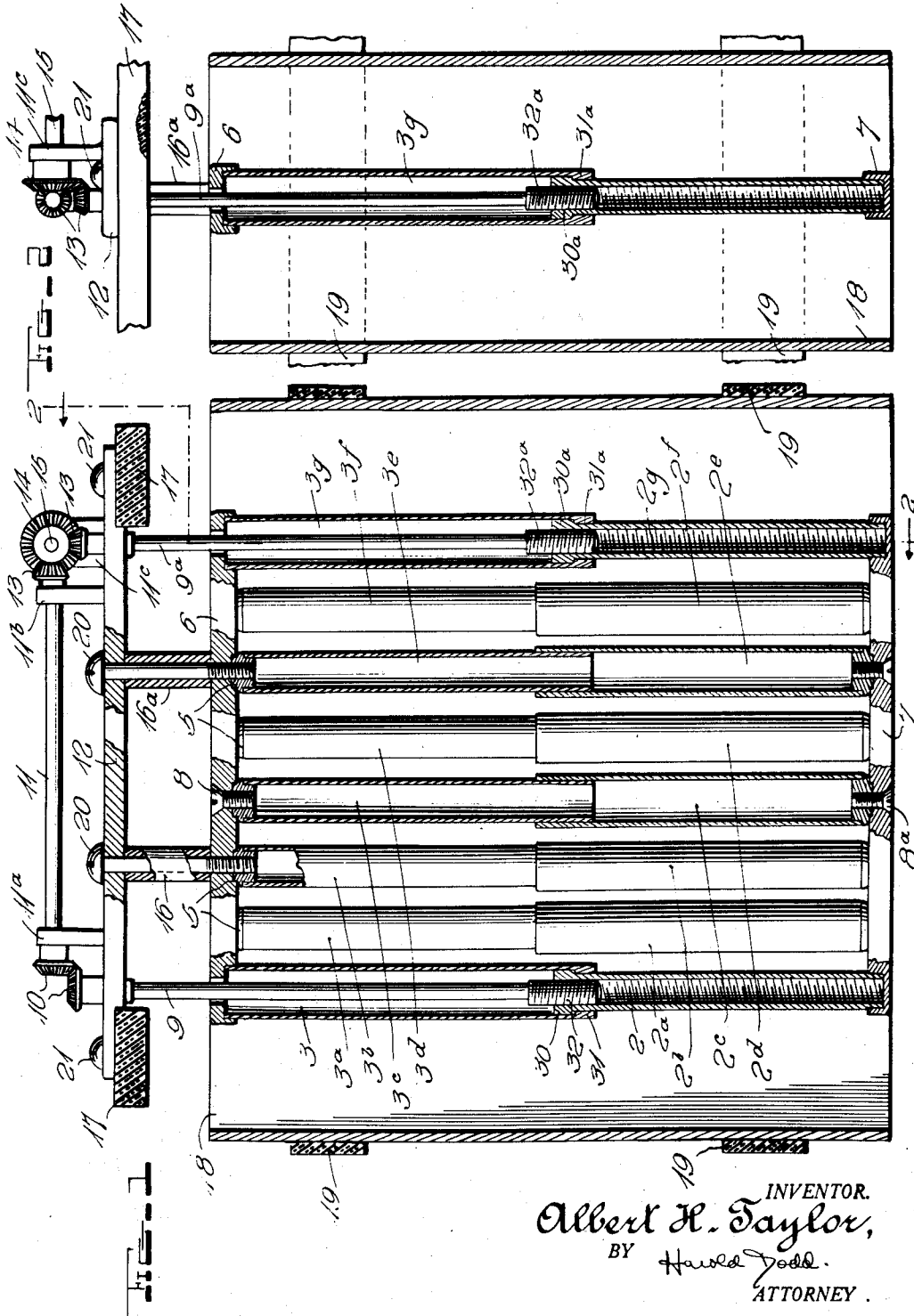
A. H. TAYLOR

1,875,360

CONDENSER SYSTEM

Filed Feb. 11, 1929

2 Sheets-Sheet 1



Sept. 6, 1932.

A. H. TAYLOR

1,875,360

CONDENSER SYSTEM

Filed Feb. 11, 1929

2 Sheets-Sheet 2

FIG. 3

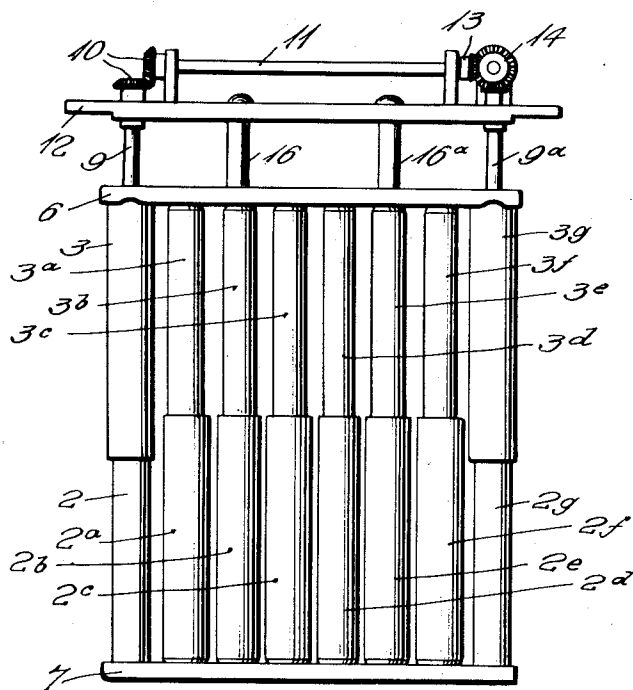
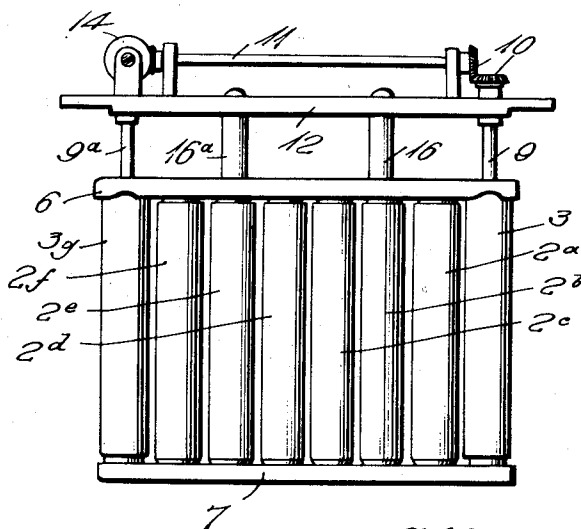


FIG. 4



INVENTOR.
Albert H. Taylor,
BY *Harold J. Jole*
ATTORNEY.

UNITED STATES PATENT OFFICE

ALBERT H. TAYLOR, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR TO WIRED RADIO, INC., OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

CONDENSER SYSTEM

Application filed February 11, 1929. Serial No. 339,138.

My invention relates to condenser systems in general and more specifically to condensers wherein the capacity is adjustable over a given range.

An object of my invention is to provide certain improvements in adjustable condensers whereby a wide range of capacity may be obtained when used in high power circuits.

Another object of my invention is to provide an adjustable high power condenser system whereby relatively coarse adjustments of capacity may be easily and readily obtained.

Still another object of my invention is to provide an adjustable high power condenser whereby both coarse and fine adjustments of capacity may be easily and readily obtained.

Other objects of my invention are to provide certain structural features in adjustable condensers, a better understanding of which can be had from the specification following and from the accompanying drawings wherein:

Figure 1 illustrates a part section in side elevation; Fig. 2 shows an end elevation in part section; and Figs. 3 and 4 are side elevations showing adjustments for different capacity values.

In condenser systems the capacity depends upon the effective areas of the parts, the dielectric and the separation or spacing of the parts. Different adjustments of capacity are most readily obtained by changing the relative area of the parts and this is usually accomplished by moving one or more of the parts comprising the capacity to a position where the adjacent area of the parts is increased or decreased. The movable part is usually moved to a position reserved for such part where the capacity relation is a minimum when a minimum adjustment of capacity is desired. This space is of no use when adjustments of maximum capacity are made. In the condenser system of my invention many disadvantages of other condenser systems are avoided and many advantages are obtained as will appear from the specification following:

Figure 1 of the accompanying drawings illustrates a side elevation of the condenser

system of my invention. A plurality of metallic tubes 3, 3a, 3b, 3c, 3d, 3e, 3f, 3g, are supported by member 16 and attached thereto by screws 8 threaded in bushings 5. Tube 3c is shown in cross-section comprising any suitable metal or alloy thereof. Metallic tubes 2, and 2g slide inside and bear against the interior walls of tubes 3 and 3g respectively. Tubes 2a, 2b, 2c, 2e, and 2f have diameters slightly greater than tubes 3a, 3b, 3c, 3d, 3e and 3f, the interior walls of the former slide over and bear against the latter tubes. The lower ends of tubes 2a, 2b, 2c, 2d, 2e and 2f are attached to supporting member 7 by screws 8a. Tubes 2, 2g and 3, 3g have their upper ends and lower ends respectively so shaped as to serve as a stop.

This may be accomplished in the manner shown, in section, of tubes 2 and 3 represented by the reference characters 30 and 31. Tube 2 is provided with a threaded portion with which the enlarged threaded end 32 of shaft 9 engages. Shaft 9 extends through the axis of tube 3. The upper end of shaft 9 is provided with bevel gears 10 which provide a mechanical connection with shaft 11. Shaft 11 is supported by members 11a and 11b, the latter provided with suitable bearings. Members 11a and 11b may be integral with member 12, the latter being provided with suitable bearings for shafts 9 and 9a. Shaft 9a is similar to shaft 9 and is in like manner mechanically associated with shaft 11 by means of suitable bevel gears 13. Motion is transmitted to gears 13, shaft 11 and gears 10 by means of gear 14. Spacing members 16 and 16a support member 6 and the metallic tubes associated therewith. Frame member 12 rests upon insulating members 17 which may be mounted on the main framework of the transmitter or apparatus with which the condenser system is to be employed. A stationary plate member 18 shown in section may be supported from the main framework by insulating members 19. The adjustable tube members and member 6 may be attached to member 12 by means of screws 20 and member 12 in turn positioned to the main framework by screws 21.

Fig. 2 is an illustration in part section

showing an end elevation of the condenser system of my invention. Corresponding reference characters are employed in all of the drawings.

5 Gears 13 are similar to gears 10 and 13 shown in Fig. 1. A rotary motion is transmitted to gears 13 by means of gear 14. Gear 14 is attached to the end of shaft 15, the latter resting in a suitable bearing provided in member 11c. Member 11c may be
10 integral with or in any manner supported from member 12. Members 30a, 31a and 32a correspond to members 30, 31 and 32 respectively, shown in Fig. 1 previously referred to.

15 Figs. 3 and 4 of the accompanying drawings illustrate side elevations of the condenser system of my invention. Stationary plate 18, shown in Figs. 1 and 2, is omitted from Figs. 3 and 4. Fig. 3 shows the position of tubular members 2, 2a, 2b, 2c, 2d, 2e,
20 2f and 2g for maximum capacity setting. Fig. 4 shows the position of the tubular members for minimum capacity obtainable by means of adjusting mechanism 9, 9a, 10, 11 and 14. Opposite side elevations are illustrated in Figs. 3 and 4.

There is thus provided a condenser having smooth edges and adequate spacings of its elements, with a minimum of corona effect,
30 and therefore adapted for use at high power.

Many combinations of the tubular members are possible to provide a condenser system having the capacity desired. By referring to any one or all of the accompanying
35 drawings the many possible combinations and the advantages may be learned. As an example, suppose that the maximum capacity obtained, when the tubular members are in the position shown in Fig. 3, is greater than that desired. Any or all of tubular
40 members 2a, 2b, 2c, 2d, 2e and 2f may be removed by loosening the screw or screws through member 7 which holds the respective tubular member or members in place.

45 By means of adjusting mechanism 9, 10, 11 and 14 the remaining tubular members may be caused to collapse over each other in the position shown in Fig. 4. With certain of tubular members 2a, 2b, 2c, 2d, 2e and 2f
50 removed the minimum capacity will be slightly less than the former capacity value. This slight reduction in the minimum capacity is accounted for by the thickness of the wall of the tubular members removed. The
55 reduction in the maximum capacity obtainable is, however, relatively large. Tubular members 2, 2a, 2b, 2c, 2d, 2e, 2f and 2g bear against tubular members 3, 3a, 3b, 3c, 3d, 3e, 3f and 3g and the friction may be considerable between the two groups. The members
60 may be made of aluminum or other light weight metal. Should it be desired that the minimum capacity value obtainable by adjusting mechanism 10, 11, 13 and 14 remain the same, although it be also desired to reduce

the maximum capacity obtainable by the adjusting mechanism; any or all of tubular members 2a, 2b, 2c, 2d, 2e and 2f may be released from their position to member 7 when
70 the tubular members are in the position shown in Fig. 4. Now adjusting mechanism 10, 11, 13 and 14 causes the capacity to increase, the screws being removed from certain of tubular members 2a, 2b, 2c, 2d, 2e and 2f allowing these members to remain in their
75 respective initial positions and not influenced by the downward movement of those members secured by screws to member 7. In like manner any or all of the screws through member 6, serving to attach members 3a, 3b, 3c, 3d, 3e and 3f, may be removed thereby allowing the members so released to follow the downward movement of
80 any or all of members 2a, 2b, 2c, 2d, 2e and 2f. Some of the screws through member 6 and also some of the screws through member 7 may be removed.

As an example of the flexibility and many combinations, any or all of members 2a, 2b, 2c, 2d, 2e and 2f may be released from member 7 or totally removed from the condenser
90 unit. Likewise any or all of members 3a, 3b, 3c, 3d, 3e and 3f may be released from member 6 or totally removed from the condenser unit. By releasing or removing a corresponding number of tubular members from both members 6 and 7 the maximum capacity value and minimum capacity value obtainable by adjusting mechanism 10, 11, 13 and 14
100 may be correspondingly lowered.

I realize that many modifications of the condenser system of my invention are possible without departing from the spirit of my invention. Such condensers may be connected in series or parallel with other condensers. A plurality of such condensers may be controlled by a single mechanical means. The respective plate members may be other than as illustrated in the accompanying drawings and suitable mechanical means
105 other than as shown. The parts may be insulated or adequately shielded without departing from my invention.

It is to be further understood that my invention shall not be limited by the foregoing
115 specification or by the accompanying drawings but only by the scope of the appended claims.

What I claim as new and desire to secure by Letters Patent of the United States is
120 as follows:

1. In a high power condenser system an adjustable capacity element comprising in combination a plurality of metallic tubular members adapted to telescope one over the
125 other, mechanical means for causing the movement of said members in balanced relationship, and a second capacity element adjacent to and insulated from said first mentioned element.

2. A condenser system comprising in combination a plurality of metallic tubular members adapted to telescope one over the other, mechanical means for causing the movement
 5 of said members in balanced relationship, and a stationary plate member adjacent to and electrically insulated from said tubular members, said stationary plate member constituting one element of said condenser system and said tubular members constituting
 10 the other element of said condenser system.

3. In a condenser system, a pair of conductive tubular members adapted to slide over each other, means for controlling the
 15 motion of said tubular members over each other in balanced relationship, and a conductive plate adjacent to and electrically insulated from said tubular members, said plate member constituting one element of said condenser system and said tubular members constituting
 20 the other element of said condenser system.

4. In a condenser system, a pair of conductive tubular members adapted to slide
 25 over each other in conductive relationship, means for controlling the motion of said tubular members over each other in balanced relationship, and a conductive plate adjacent to and electrically insulated from said tubular members.

5. In a condenser system, a plurality of pairs of conductive tubular members, the members constituting each pair being adapted to slide over each other, means for mechanically connecting together the group of
 35 members consisting of one member of each pair, means for mechanically connecting together the group of members consisting of the other member of each pair, means for relatively moving said groups of tubular members over each other in balanced relationship, and a conductive plate adjacent to and electrically insulated from said tubular members, said plate member constituting one
 40 element of said condenser system and said tubular members constituting the other element of said condenser system.

6. In a condenser system, a plurality of pairs of conductive tubular members, the members constituting each pair being adapted to slide over each other in conductive relationship, means for mechanically connecting together the group of members consisting of one member of each pair, means for
 55 mechanically connecting together the group of members consisting of the other member of each pair, means for relatively moving said groups of tubular members over each other in balanced relationship, and a conductive plate adjacent to and electrically insulated from said tubular members.

7. In a condenser system, a plurality of pairs of conductive tubular members, the members constituting each pair being adapted
 65 to slide over each other, means for me-

chanically connecting together the group of members consisting of one member of each pair, means for mechanically connecting together the group of members consisting of the other member of each pair, all of said
 70 tubular members being electrically connected together, means for relatively moving said groups of tubular members over each other in balanced relationship, and a conductive plate adjacent to and electrically insulated from said tubular members.

8. In a condenser system, a plurality of pairs of conductive tubular members, the members constituting each pair being adapted to slide over each other, means for mechanically connecting together the group of
 80 members consisting of one member of each pair, means for mechanically connecting together the group of members consisting of the other member of each pair, means for relatively moving said groups of tubular members over each other in balanced relationship, and a conductive enveloping member surrounding said tubular members.

9. In a condenser system, a plurality of
 90 pairs of conductive tubular members, the members constituting each pair being adapted to slide over each other, means for mechanically connecting together the group of members consisting of one member of each pair, means for mechanically connecting together the group of members consisting of the other member of each pair, a plurality of translating means actuated from a single control for controlling the relative movement
 100 of said groups of tubular members over each other in balanced relationship, and an external conductive member adjacent to and electrically insulated from said tubular members, said external conductive member constituting one element of said condenser system and said tubular members constituting the other element of said condenser system.

10. In a condenser system, a plurality of
 110 pairs of conductive tubular members, the members constituting each pair being adapted to slide over each other, means for mechanically connecting together the group of members consisting of one member of each pair, means for mechanically connecting together the group of members consisting of the other member of each pair, a plurality of translating means disposed on the outside of said system of groups of tubular members and symmetrically with reference to the center thereof, and adapted to be simultaneously and uniformly actuated from a single control for controlling the relative movement
 120 of said groups of tubular members over each other in balanced relationship, and an external conductive member adjacent to and electrically insulated from said tubular members, said external conductive member constituting one element of said condenser system and said tubular members constituting
 130

the other element of said condenser system.

11. In a condenser system, a plurality of pairs of conductive tubular members, the members constituting each pair being adapted to slide over each other, means for mechanically connecting together the group of members consisting of one member of each pair, means for mechanically connecting together the group of members consisting of the other member of each pair, a plurality of screw-thread actuated translating means for controlling the relative movement of said groups of tubular members over each other in balanced relationship, and an external conductive member adjacent to and electrically insulated from said tubular members, said external conductive member constituting one element of said condenser system and said tubular members constituting the other element of said condenser system.

ALBERT H. TAYLOR.

25

30

35

40

45

50