June 15, 1926. 1,588,474

A. A. KENT

CONDENSER

Filed June 6, 1925

Fig. 1.

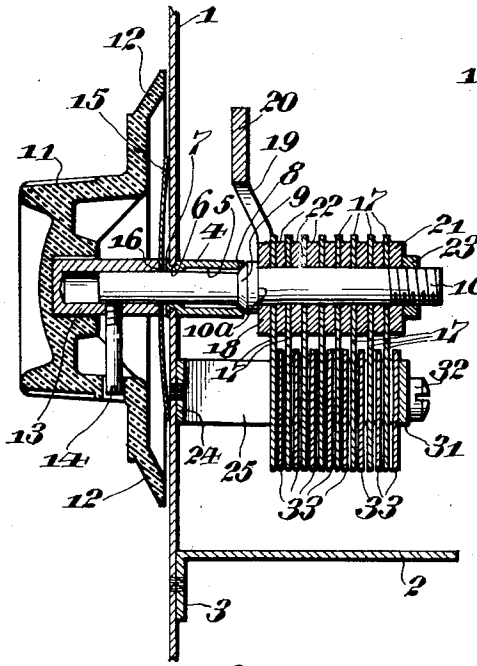


Fig. 2.

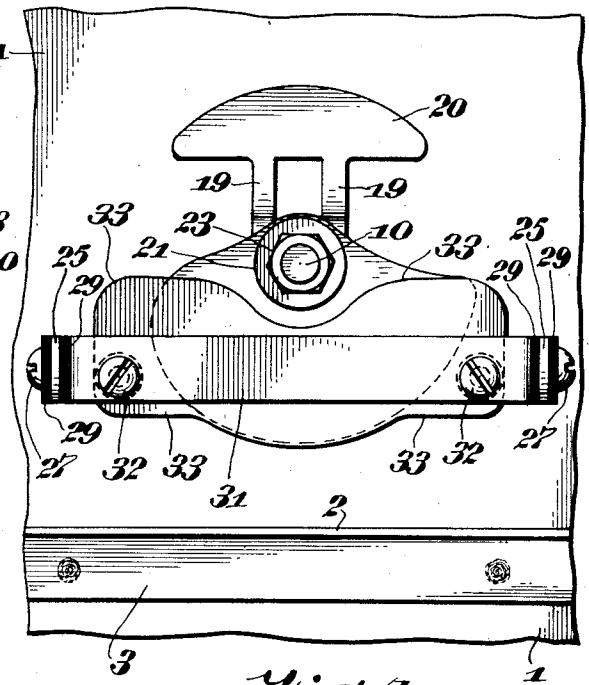


Fig. 3.

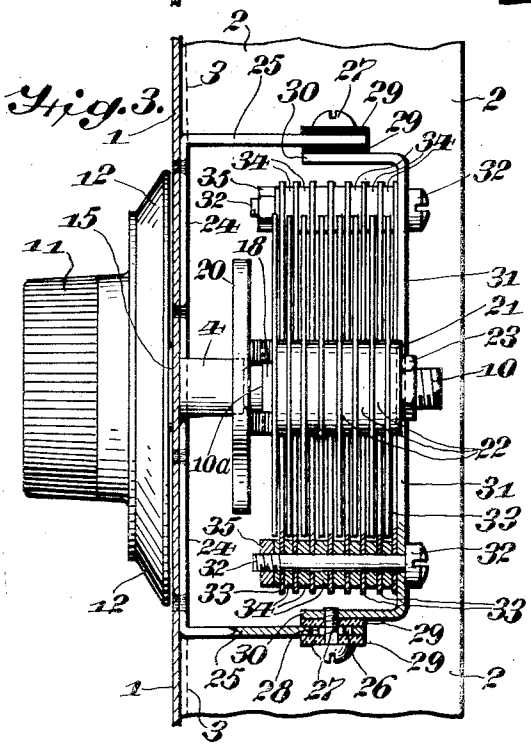


Fig. 4.

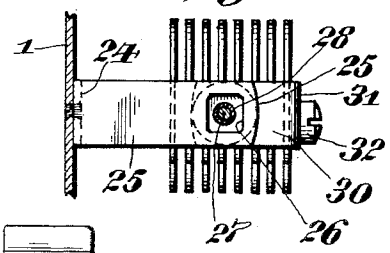
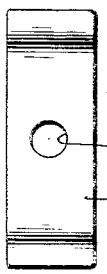


Fig. 5.



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UNITED STATES PATENT OFFICE.

ARTHUR ATWATER KENT, OF ARDMORE, PENNSYLVANIA.

CONDENSER.

Application filed June 6, 1925. Serial No. 35,296.

My invention relates to variable electrical condensers of the plate type for variation of capacity, as in tuning of circuits, particularly circuits transversed by high frequency current or oscillations, as in radio systems.

In accordance with my invention, the stator element of the condenser structure or unit comprises one or more plates carried upon a bolt or rod secured to a yoke or bracket member which in turn is secured at its opposite ends to a supporting member or bracket, for adjustment thereat pivotally about an axis extending at right angles to the axis of rotation of the rotor element, for adjustment in a direction parallel to the rotor axis and also in a direction normal to the rotor axis, or in directions lying between said last named directions.

Further in accordance with my invention, the panel, plate or wall of a radio receiving set, and more particularly the metal panel or wall of a cabinet enclosing the receiving set, is comprehended in or is a component part of the condenser structure or unit, of the character above referred to, the supports for the rotor and stator being attached to the panel independently of each other.

My invention resides in structure of the character hereinafter described and claimed.

For an illustration of one of the forms my invention may take, reference is to be had to the accompanying drawing, in which:

Figure 1 is a vertical sectional view, partly in elevation, of structure embodying my invention.

Fig. 2 is a rear elevational view of the structure shown in Fig. 1.

Fig. 3 is a top plan view, partly in horizontal section, of the structure shown in Fig. 1.

Fig. 4 is a side elevation of the stator element and its support, with the panel in vertical section.

Fig. 5 is an end elevational view of the spring.

Referring to the drawing, 1 is the sheet metal panel, plate or wall of a cabinet or housing containing the elements of a radio receiving set, as described in my application Serial No. 28808, filed May 8, 1925, and is comprehended in or is a component of one or more condenser units of the receiving set.

On the inner side of the panel 1 is the ledge member 2, which may be of sheet metal, having the downwardly extending flange 3 secured, as by spot-welding to the panel 1.

Upon the ledge member 2 may be carried other devices or elements of the radio receiving set with which co-operates the condenser structure herein described.

The rotor bearing member 4 is a metal sleeve, preferably chambered as indicated at 5, and having on its exterior a portion 6 of reduced diameter extending through a hole of similar diameter in the panel 1, with its end spun or worked over into the form of the flange 7, between which and the shoulder on the sleeve 4 the panel 1 is snugly gripped, whereby the bearing sleeve 4 is rigidly secured to the panel independently of the stator supporting means.

At its end remote from the panel 1 the sleeve 4 is provided with a conical or equivalent seat 8 upon which bears the conical or similar enlargement 9 on the rotor shaft 10, which latter rotates upon and in the sleeve 4 and projects beyond the same to the opposite or front side of the panel 1, where there is secured to the shaft 10 the operating handle or knob 11, integral with which is the dial 12, carrying the usual graduations for co-operation with an index on the panel 1. The members 11 and 12 are preferably constituted of molded insulating material, such as bakelite or the like. Molded in the knob structure is the metal insert member 13 through a wall of which extends the set screw 14 for securing the sleeve 13, and thereafter the knob and dial, to the shaft 10, whereby the shaft may be rotated to effect adjustment of the hereinafter described rotor structure with respect to the co-acting stator structure, for varying the capacity of the condenser. Between the end of member 13 and the plate 1 is disposed the bowed spring 15 having the hole 16 through which the shaft 10 loosely extends. The spring 15 is held under compression between the member 13 and plate 1, thereby exerting a longitudinal thrust toward the left of Fig. 1, upon the shaft 10, causing its conical bearing 9 snugly to bear in the conical member 8 in the sleeve member 4. The spring 15 is free or floats between the members 1 and 13, for it is not secured to either of those members or to any other member.

Upon the part of the shaft 10 overhanging beyond the bearing member 4 are secured one or more parallel conducting leaves

or plates 17 constituting the rotatable armature assembly or rotor element of the condenser. Against the shoulder 10a on the shaft 10 is disposed the hub 18 provided with outwardly extending arms 19 carrying the counterweight 20 for substantially balancing the rotor structure. Between the hub 18 and the washer 21 are disposed the several plates 17 with intervening spacer washers 22, all firmly held by the nut 23 threaded upon the shaft 10.

The metal plate or member 24, having the rearwardly extending arms 25, serves as a support or bracket for the stator element. The member 24 is secured, as by spot-welding or otherwise, to the rear face of the panel 1, independently of the rotor support 4.

Each of the arms 25 is provided adjacent its extremity with an aperture 26 within which is adjustable in directions parallel and normal to the rotor axis, and in directions lying between said directions, the pivot pin or screw 27, surrounded by an insulating bushing 28, and extending through the insulating washers 29, 29, and threaded into the inwardly extending arms 30 on opposite ends of the bar or plate 31 constituting with the arms 30 a yoke or bracket which carries the stator plate assembly.

Adjacent each of the opposite ends of the member 31 is a bolt or rod 32 extending through the member 31 and the several stator plates or leaves 33, between which interleave the rotor plates 17, spaced from each other by the spacer washers 34 and all clamped in position by the nuts 35 threaded upon the bolts or rods 32.

The stator element is pivotally adjustable upon the co-axial pivots or screws 27, about an axis extending at right angles to and offset to one side of the axis of rotation of the rotor element. The stator element is also adjustable in various other directions parallel with and/or normal to the rotor axis by suitably positioning the screws or pivots 27 within the aperture 26. Any of the adjustments described may be effected by loosening the screws 27, effecting the adjustment, and then again tightening the screws.

What I claim is:

1. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, and stator plate structure secured to and electrically connected with said member between said arms.

2. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, a plurality of substantially parallel stator plates electrically connected with said member and spaced from each other longitudinally of the rotor axis, and a rod securing said plates to said member between said arms.

3. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, a plurality of substantially parallel stator plates electrically connected with said member and spaced from each other longitudinally of the rotor axis, and a rod securing said plates to said member with one of said plates disposed between said member and the end rotor plate.

4. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, a plurality of substantially parallel stator plates electrically connected with said member, and spacer members between said stator plates, and bolts extending through said member and said spacer members.

5. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, stator plate structure secured to said member, a stator support comprising arms disposed adjacent said first named arms, and means adjustably securing said first named arms to said last named arms.

6. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, stator plate structure secured to said member, a stator support comprising arms disposed adjacent said first named arms, and pivot members securing said first named arms to said last named arms for permitting pivotal adjustment of the stator assembly about an axis extending transversely to the rotor axis.

7. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, stator plate structure secured to said member, a stator support comprising arms disposed adjacent said first named arms, and pivot members securing said first named arms to said last named arms for permitting pivotal adjustment of the stator assembly about an axis extending

transversely to the rotor axis and displaced to one side thereof.

8. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, stator plate structure secured to said member, a stator support comprising arms disposed adjacent said first named arms, means adjustably securing said first named arms to said last named arms, and a panel to which said stator support is secured.

9. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, stator plate structure secured to said member, a stator support comprising arms disposed adjacent said first named arms, means adjustably securing said first named arms to said last named arms, a panel to which said stator support is secured, and means for attaching the rotor to said panel independently of said stator support.

10. In a condenser comprising rotor and stator elements, a stator assembly comprising a member extending transversely of the rotor axis, arms on the opposite ends of said member extending substantially parallel with the rotor axis, stator plate structure secured to said member, a stator support comprising arms disposed adjacent said first named arms, pivot members securing said first named arms to said last named arms for permitting pivotal adjustment of the stator assembly about an axis extending transversely to the rotor axis, a panel to which said stator support is secured, and means for attaching the rotor to said panel independently of said stator support.

ARTHUR ATWATER KENT.