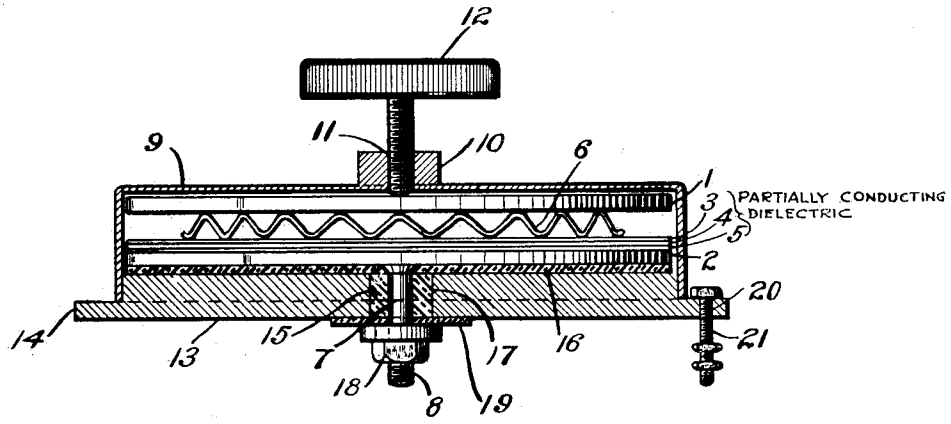
Sept. 2, 1924. **1,506,781**

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VARIABLE LEAKY CONDENSER

Filed Aug. 18, 1921



WITNESSES:

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Patented Sept. 2, 1924. 1,506,781

UNITED STATES PATENT OFFICE.

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VARIABLE LEAKY CONDENSER.

Application filed August 18, 1921. Serial No. 493,283.

To all whom it may concern:

Be it known that I, JAMES E. SHRADER, a citizen of the United States, and a resident of Edgewood, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Variable Leaky Condensers, of which the following is a specification.

My invention relates to variable electrical condensers, more especially to leaky condensers designed for use in wireless telegraphy and telephony, it being among the objects thereof to provide condensers of this type which are simple in construction and which are relatively inexpensive to manufacture.

A further object of this invention is to provide a condenser the capacity of which may be manually adjusted and which is exceedingly sensitive to such adjustment.

Another object of this invention is to provide a condenser structure which has a flexible regulating means, yet possesses rigidity and good mechanical qualities.

When a vacuum tube is used as a detector of damped oscillations in modern wireless receiving systems, the grid is insulated from the filament by a condenser, except for such leakage as takes place through the tube or the condenser. If the tube and the condenser are highly insulated, the grid may accumulate a high negative charge which may reduce the plate current practically to zero. In such instances, the usual practice consisted of providing a parallel resistor of suitable value around the condenser.

Since vacuum tubes have different characteristics, it is desirable to provide condensers and resistors therefor that are variable over a considerable range to assure best operation. My invention provides a condenser that includes a resistance device in its structure that is adjustable and that has, in its dielectric, sufficient leakage to render unnecessary the parallel resistor heretofore employed. The resistance of my condenser may be varied to cause the capacity thereof to change in an inverse ratio.

In practicing my invention, I provide plates or discs of conducting material having a partially conducting dielectric therebetween. The dielectric may consist of a plurality of layers of paper or fabric or the like impregnated with india ink, graphite in solution or suspension or such other material as will provide proper leakage. A corrugated metal plate or disc of thin material is interposed between the upper conductor plate and the dielectric material to provide means for adjustment of the distance between the conductor plates for varying the capacity and resistance of the condenser. The condenser elements are enclosed within a protective casing, and the relative positions of the conductor plates are varied by means of a screw adjustment device provided on the outside of the casing.

In the accompanying drawing forming a part hereof and in which like reference characters designate like parts,

The single figure is a cross-sectional view, partially in elevation, of a condenser formed in accordance with this invention.

A pair of conductor plates or disks 1 and 2 have inserted therebetween a plurality of layers 3, 4 and 5 of dielectric material, such as condenser paper impregnated or coated, on one or both sides, with india ink, graphite or other suitable material to make them partially conducting.

A corrugated metal disc 6 is inserted between the conductor plate 1 and the dielectric material 3. The corrugations of the disk 6 may be flattened by pressure or released to provide variable spacing between the conductor plates 1 and 2. The plate 2 is provided with a centrally projecting stud 7 having a threaded end 8. The condenser elements are contained within a casing 9 having a projection 10 thereon which is provided with a threaded opening 11 for holding the thumb screw 12 which makes contact with conductor plate 1.

The casing 9 is mounted on a base 13 having a flange 14 and provided with a central opening 15. An insulating disc 16 is interposed between the plate 2 and the base 13, and an insulating bushing 17 insulates the stud 7 from the base. A nut 18, insulated from the base by an insulating washer 19, is secured on the threaded end 8 of the stud 7.

An opening 20 is formed in the flange 14 in which a screw 21, having nuts thereon, is inserted to provide a terminal. The other terminal may be the stud 7.

To vary the capacity and resistance of the condenser, the thumb screw 12 is screwed

against the plate 1, causing the corrugated disc 6 to flatten out under the pressure which lessens the distance between the plates 1 and 2 and thus increases the capacity of the condenser. The capacity varies inversely with the distance between the plates 1 and 2 and the resistance becomes less because of better and greater area of contact of the flattened corrugated metal disc 6 with plate 1 and the dielectric material.

Thus, by varying the distance between plates 1 and 2, the capacity and the resistance are both varied, the change in the one being in proper relation to the change in the other.

Although I have described a specific embodiment of my invention, it will be obvious that various changes may be made in the construction of condensers within the scope thereof. For instance, the design of the condenser permits varying the conductor and dielectric material to obtain capacities and resistances which vary within wide limits, it being possible to provide very low or very high resistance and small or negligible or relatively high capacity. These and other changes in the details of construction of my condenser may be made within the scope of my invention.

I claim as my invention:

1. A variable leaky condenser comprising a plurality of conductors, dielectric material treated with a conducting material interposed between said conductors and means for varying the distance between said conductors.

2. A variable leaky condenser comprising a plurality of conductors, a plurality of layers of dielectric material treated with a conducting material interposed therebetween and means for varying the distance between said conductors.

3. A variable leaky condenser comprising a plurality of conductors, a plurality of superposed layers of dielectric material coated with a conducting material and located therebetween and means for varying the distance between said conductors.

4. A variable leaky condenser comprising a plurality of conductors, a plurality of superposed layers of dielectric material impregnated with a conducting material and located therebetween and means for varying the distance between said conductors.

5. A variable leaky condenser comprising a plurality of conductors, a plurality of superposed layers of dielectric material impregnated with india ink and located therebetween and means for varying the distance between said conductors.

6. A variable leaky condenser comprising a plurality of conductors, a plurality of superposed layers of dielectric material impregnated with a solution of graphite and located therebetween and means for varying the distance between said conductors.

7. A variable leaky condenser comprising a plurality of conductors, a layer of partially conducting dielectric material therebetween, a corrugated metal disc between said conductors and means for flattening the corrugations thereof.

8. A variable leaky condenser comprising a plurality of conductors, a plurality of superposed layers of dielectric material impregnated with india ink and located therebetween, a corrugated metal disc between conductors and means for flattening the corrugations thereof.

9. A variable leaky condenser comprising a plurality of conductors, a plurality of superposed layers of dielectric material impregnated with graphite and located therebetween, a corrugated metal disc between the conductors and means for flattening the corrugations thereof.

In testimony whereof, I have hereunto subscribed my name this 16th day of August, 1921.

JAMES E. SHRADER.