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QUICKLY ATTACHABLE AND DETACHABLE ROTOR BRAKE AND CONTACT WIPER

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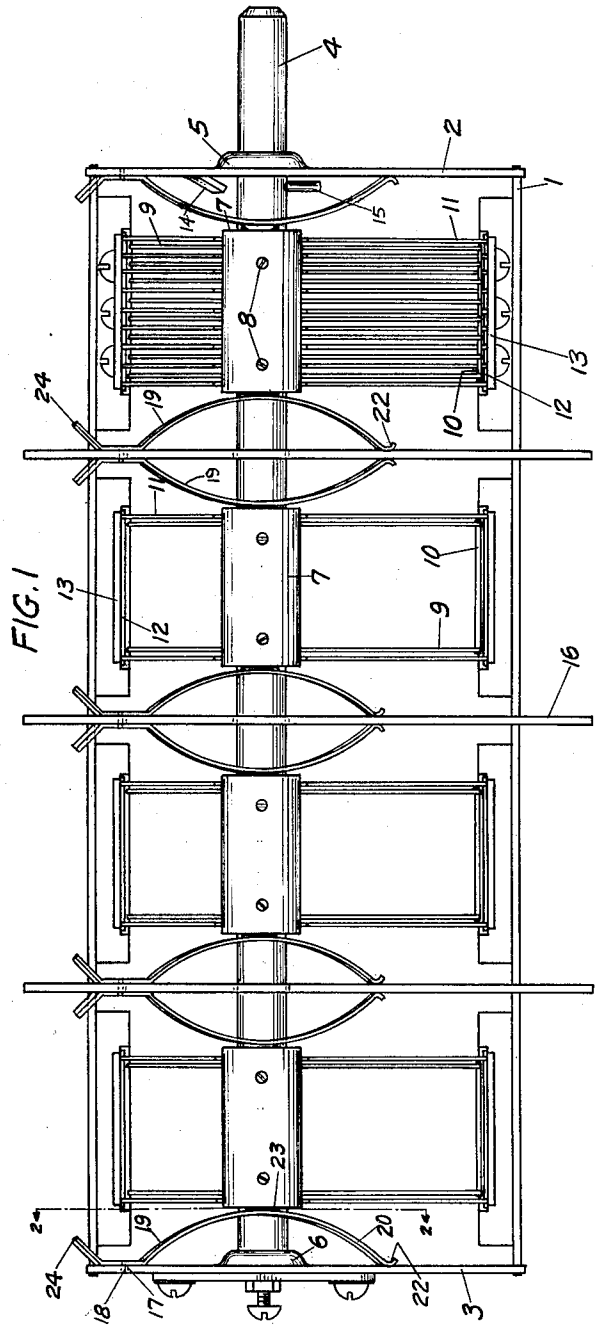

FIG. 1

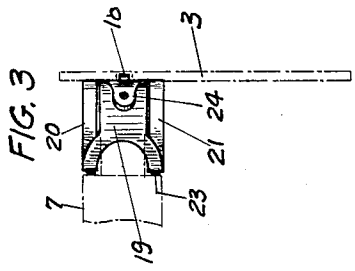

FIG. 3

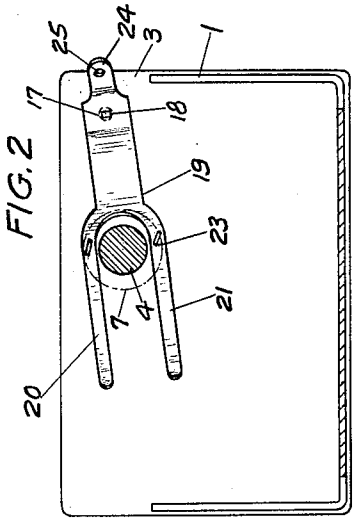

FIG. 2

Inventor
EMIL D. KOEPPING

Attorney
A. D. T. Libby

Patented Apr. 12, 1932 1,853,213

UNITED STATES PATENT OFFICE

EMIL D. KOEPPING, OF HADDON HEIGHTS, NEW JERSEY, ASSIGNOR TO RADIO CONDENSER COMPANY, OF CAMDEN, NEW JERSEY

QUICKLY ATTACHABLE AND DETACHABLE ROTOR BRAKE AND CONTACT WIPER

Application filed July 23, 1930. Serial No. 470,094.

This invention relates to an improvement in an electrical condenser of the type used in tuning circuits of radio receiving sets.

In application Serial Number 332,700, filed January 15, 1929, by Stanley S. Cramer, now Patent 1,800,719, issued April 14, 1931, there is shown and described an improved form of condenser in which the rotor or rotors are carried on a shaft supported on antifrictional bearings, the idea being to eliminate to the greatest extent, the difficulties caused by misalignment in the manufacturing processes of the shaft, and distortion of the rotor plates due to binding of the shaft, and other troubles encountered in manufacture. In the said Cramer patent, special means are shown and described for applying a definite amount of braking action or friction to the shaft as desired, in order to hold the rotor or rotors in any position to which they may be turned by the operator.

My present invention is directed to an improved method of obtaining this braking action and also at the same time to insure that good electrical contact may be secured with the rotor. The use of ball bearings naturally reduces the friction between the shaft and its mounting supports, and consequently reduces the electrical contact between the rotor plates and the frame of the condenser which is usually grounded, it being the usual practice to connect the rotor of the condenser or condensers to the ground of the receiving set.

It is therefore the principal object of my present invention to obtain an instrumentality which will perform a dual function of acting as a mechanical brake and as an electrical contact device in the type of condenser referred to above.

Another object of my invention is to obtain a construction in which the combined brake and contact wiper may be quickly applied or removed for the purpose of changing the tension of the braking device, or even using one of different grade of material, whereby in a gang condenser, the same may be quickly adjusted with respect to the braking action. My improvement will be understood by reference to the annexed drawings, wherein:

Figure 1 is a plan view of a four-gang condenser.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is an end view of the brake and contact wiper, looking from the right of Figure 2.

Referring now to the details, wherein like numbers refer to corresponding parts in the various views, 1 is the framework of a condenser having end bearing plates 2 and 3 carrying a rotor shaft 4. The plate 2 is provided with a ball bearing 5, and the plate 3 with a ball bearing 6, all as set forth in said Cramer patent.

Carried on the shaft 4, is a plurality of sleeves 7 fastened to the shaft 4 in any satisfactory manner as by set screws 8. The sleeve 7 carries rotor plates 9, at least one end of which are held together by a tie bar 10. The stator plates 11 are fastened together by tie bars 12, which are supported by insulators 13, one end of which is attached to the frame 1.

A lug 14 is struck inwardly from the end plate 2 and acts as a stop for the pin 15 fastened to the shaft 4, thereby limiting the movement of the rotor shaft in the minimum capacity position. Each of the units of the gang condenser is separated by a combined shield and brace plate 16, which preferably extends beyond the edges of the frame. Furthermore, if desired, a complete shield may be fitted around the entire gang condenser, but since this forms no part of my present invention, I have not shown it in the drawings. Also, each of the condenser units may be provided with a trimming condenser such as shown and described in my application Serial Number 469,033, filed July 19, 1930.

Each of the plates 16 is provided with an orifice 17, and positioned in this orifice is a projection 18 formed in the brake and contact wiper member 19. This latter member is formed in a curvilinear manner as shown in Figure 1, and has two forks 20 and 21 which straddle the shaft 4. The free ends

of the forks 20 and 21 are preferably curved at 22 where they engage the plate 16.

In order to insure that the forks 20 and 21 make a good contact with the rotor sleeve 7, they are each provided with outwardly forced ribs, edges or projections 23 which bear directly against the end of the rotor sleeve 7, so that as the shaft 4 is turned and likewise the sleeve 7, these ribs 23 make a good wiping, self-cleaning contact directly on the sleeves which are preferably made of good conducting material. The end of each wiper member 19, which is adjacent the projection 18, is provided with a lug 24 preferably bent away from the end plate or brace plate which is thus a part of the condenser frame and on which it is mounted. Each lug 24 has a hole 25 therein, to which the ground wire may be attached, as by soldering, thereby insuring a good contact with the rotor.

In some cases it may be found desirable to use the combined brake and contact wiper member 19 at each end of the rotor sleeves 7, as shown in Figure 1, whereby a yielding braking effort is applied to both ends of the metallic sleeve carrying the rotor plates. The use of the members 19 against each end of the rotor sleeves, insures a good electrical contact with the rotor, as this yielding connection provides an automatic self-scouring contact, which is highly essential in a receiving set which is some times permitted to remain unoperated for a considerable period of time, the effect of which is that the metal oxidizes and acts to produce a bad contact. The construction herein disclosed will immediately, on turning of the rotor shaft, scour off any oxide which may have accumulated on the end of the rotor sleeve or even on the contact wiper itself, and will thus secure a definite circuit connection for the rotor or rotors.

While the shield and brace plate 16 acts to prevent electrostatic coupling of the units of the gang condenser, the members 19, by reason of securing good electrical contact with the rotors, act to equalize the potential of the rotors or bring them to the same electrical level and thereby prevent stray coupling due to varying potentials between the rotors of the different units.

In practice the plates 16 are usually thick enough so that one orifice 17 is sufficient to accommodate the projections 18 on the two members 19 carried on opposite sides of the plates 16. However, if desired the position of one of the members 19, comprising a pair engaging any one of the plates 16, may be reversed in position by providing another orifice 17 on the opposite side of the shaft 4.

As will be seen from Figure 1, the combined brake and contact wiper 19 may be quickly attached or detached from the condenser, and if the form given to the members 19 by the tools in the manufacture is not just exactly correct to get the proper result, the members 19 may be quickly bent and the device slipped into place where it is held by the projection 18.

It will thus be seen that I have provided a very cheap and effective means for securing a braking action on a condenser, as well as means for insuring a good self-scouring contact with the rotor or rotors.

Having thus described my invention, what I claim is:

1. For an electrical condenser having a frame and shaft and a rotor carried by the shaft, a combined brake and contact wiper for said shaft and rotor, consisting of a forked and curved resilient member having its opposite ends engaging a part of the frame, one end having a quick detachable anchorage on a part of the frame, while the other end is free to slide on the frame, the forked parts of said member straddling the shaft and having outwardly forced portions to engage a part of the rotor, and means for making a circuit connection to said member.

2. For an electrical condenser having a frame and shaft and a rotor carried by the shaft, a combined brake and contact wiper for said shaft and rotor, consisting of a curved resilient member having a projection near one end to seat in an opening in a part of the frame, said member being forked and the forked ends straddling the shaft and engaging the frame, said forked ends having outwardly formed contacts adjacent the shaft to engage a part of the rotor, and means for making a circuit connection to said member.

3. For a gang condenser having a frame including frame members such as end, shield and brace plates, a shaft and unit condensers positioned between pairs of said plates, each of said unit condensers comprising a stator carried on the frame and a rotor consisting of a sleeve and plates attached thereto carried by the shaft; a quickly attachable and detachable rotor brake and contact wiper consisting of, a forked and curved spring member positioned between one of said frame plates and the end of a rotor sleeve, said spring member being held in position by projecting and seat means cooperating between the spring member and its frame plate, the forked end passing around the shaft and engaging the end of the rotor, means on said forked ends to insure a good contact on the rotor sleeve, and means on said spring member for making a circuit connection therewith.

4. For a gang condenser having a frame including frame members such as end, shield and brace plates, a shaft and unit condensers positioned between pairs of said plates, each of said unit condensers comprising a stator carried on the frame and a rotor consisting of

a sleeve and plates attached thereto carried by the shaft; a quickly attachable and detachable rotor brake and contact wiper for each condenser consisting of, a forked bow spring engaging at its ends a frame member and tensioned between said member and the end of a rotor sleeve cooperating means between the spring and its frame member to slidably hold the spring in place, the forked end of the spring straddling the shaft and engaging the end of the rotor, means on said forked ends to insure a good contact on the rotor sleeve, and means on said spring member for making a circuit connection therewith.

5. For a variable gang condenser including a frame and shaft and a plurality of rotors carried by the shaft, conjoint means for reducing stray coupling between the unit condensers of the gang and obtaining a braking action for the rotor systems, said conjoint means comprising a plurality, at least one for each rotor of the gang, of forked resilient members, each having a quick detachable anchorage at one end on a part of the frame and slidably engaging the frame at the forked ends, said forked ends straddling the shaft and having projection portions in scouring engagement with a part of its associated rotor.

In testimony whereof, I affix my signature.

EMIL D. KOEPPING.