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CONTROL MECHANISM FOR RADIO APPARATUS

Filed Dec. 16, 1925

Fig. 1.

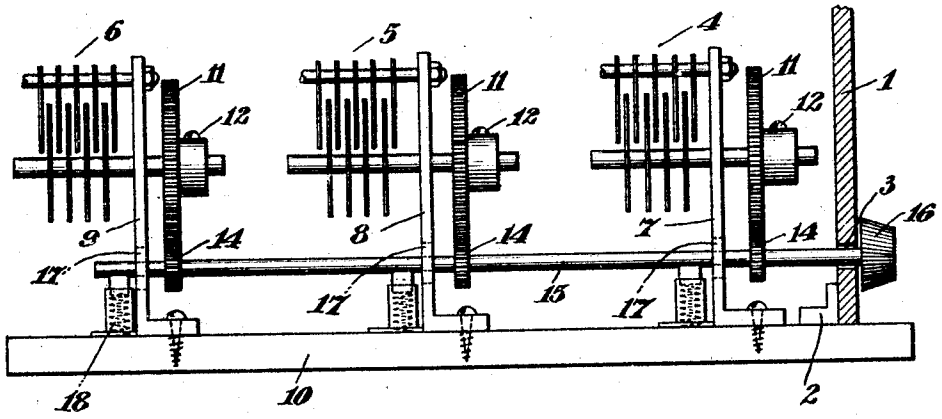
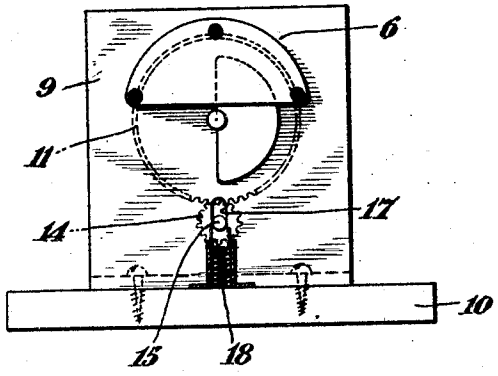


Fig. 2.



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UNITED STATES PATENT OFFICE.

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CONTROL MECHANISM FOR RADIO APPARATUS.

Application filed December 16, 1925. Serial No. 75,731.

This invention relates to a control mechanism for radio apparatus and more particularly to a means for simultaneously varying a plurality of adjustable elements by a single manually operated control. My invention finds considerable utility in the simultaneous control of a plurality of condensers in a single tuning control receiver, but it will be obvious that it may be applied equally well to a large number of other uses of the same character.

My invention provides an arrangement especially applicable to the manufacture of single tuning control receivers in large quantities and with a high degree of uniformity in which the parts are easily and quickly assembled or replaced and small deviations due to variations in manufacture, and changes of form due to climatic and temperature conditions are automatically compensated for. My invention also provides easy and quick initial adjustment of the apparatus and presents many other advantages which will be pointed out in the following specification.

As an example of my invention, I have shown in the drawings a control apparatus adapted to the simultaneous control of three condensers, although as stated above it will be obvious that my invention may be applied to other uses. In Figure 1, I show a side view of three condensers of the controlling apparatus, and in Figure 2 an end view of Figure 1.

In the case of amateur broadcast receivers, there is considerable advantage in arranging the apparatus so that several circuits may be simultaneously tuned. In the case of such receivers, this is easily accomplished by the tuning of the condenser elements of these circuits and various means have been devised to accomplish this purpose in practice. Most arrangements which have been devised for this purpose present a number of disadvantages. It is difficult, for instance, to replace condenser sections which develop defects. The construction usually involves considerable expense and difficulty in assembly and adjustment, and it is very difficult to maintain perfect alignment of the plates of the condensers under the ordinary conditions of use and movement, due to warping, shrinkage, expansion, bending or buckling of the panel and baseboards on which the units are mounted. My invention is intended to obviate these defects in the manner pointed out hereafter.

Referring to Figure 1, I have shown at 1 a panel of suitable material such as rubber or bakelite which is supported by means of the angle 2, or in any other suitable way, and which is provided with an aperture 3 of slightly larger size than the shaft intended to pass through it.

Three variable condensers 4, 5 and 6 of the usual air type are shown mounted on supporting brackets 7, 8 and 9 which may be conveniently fixed to the baseboard 10. On each of the condenser shafts is mounted a gear wheel 11 which may be held in place by means of a set screw or other appropriate means 12. The use of a set screw permits easy adjustment of the rotor plates of the condenser both axially and circumferentially and thus enables them to be quickly set to obtain an even spacing from the stator plates and also to adjust the three condensers with respect to one another so that their action will be truly simultaneous.

Pinion gears 14 are fixedly mounted to pinion shaft 15 by suitable fastening means, and meshed with the gears 11. Thus the rotation of the knob 16 will simultaneously rotate the rotors of the condensers 4, 5 and 6. The pinion shaft 15 is held against lateral movement by a slot 17 in the brackets 7, 8 and 9 upon which the stator plates of the condensers are mounted, but the shaft 15 is free to move in a vertical direction under the influence of springs 18 which press against the shaft 15 and against the baseboard 10.

It will be seen from the construction described above, several important advantages are secured. For instance, it is unnecessary to carefully and accurately line up the condensers mounted on brackets 7, 8 and 9 on the baseboard 10, approximate alignment being all that is required because even though there is a slight lateral displacement of the condensers, the pinion gears 14 will mesh positively with the gears 11 of the condensers. Should the baseboard 10 upon which the condenser brackets 7, 8 and 9 are mounted warp, shrink, expand or buckle thereby disturbing the original alignment, the pinion gear shaft and the pinion gears carried thereby will automatically follow such displacement by reason of the action of springs 18 and therefore the pinions 14 will remain firmly meshed with the condenser gears 11. I find that in this connection it is useful to make the pin-

ion gear shaft 15 slightly flexible, thus enabling it to conform to slight strains caused by warping of the baseboard, etc.

A further advantage of this arrangement is that the control mechanism is independent of slight obliquity of the condenser shafts from the straight line in which they should be mounted. I find that because of the flexibility of the arrangement a relatively large degree of obliquity is permissible without interfering with the operation of the device.

It will be noted also that each condenser is mounted independently of the others and consequently any strain existing in the apparatus is exerted upon one condenser and does not destroy the relation of the condensers one to the other, and also that the condensers may be individually adjusted, repaired or replaced without disturbing the other portions of the mechanisms.

It will be understood that many modifications may be made without departing from the spirit of my invention and I therefore do not wish to confine myself to the particular device illustrated and described and include all such modifications within the scope of my claims.

I claim:

1. In a control mechanism for radio apparatus, a plurality of substantially aligned elements separately mounted, a driven member affixed to each of said elements, a common operating shaft having driving members thereon adapted to coact with said driven members, said shaft being mounted in resilient members to maintain coaction between said driving members and driven members.

2. In a control mechanism for radio apparatus, the combination of a plurality of adjustable independent elements a flexible operating shaft resiliently mounted and driving means on said shaft adapted to engage with driven means on said elements.

3. In radio apparatus means for simultaneously tuning a plurality of circuits comprising in combination, a plurality of separately mounted tuning elements, a member connected to each of said elements for adjusting the same, a common shaft for operating said members in unison, and a resilient mounting for said shaft.

4. In radio apparatus, means for simultaneously tuning a plurality of circuits comprising in combination, a plurality of separately mounted tuning elements, a driven member connected to each of said elements for adjusting the same, a driving member coacting with each of said driven members, a flexible shaft to which said driving members are secured, and a resilient mounting for said shaft.

5. In radio apparatus, means for simultaneously tuning a plurality of circuits, comprising in combination, a plurality of separately mounted tuning elements, substantially aligned in tandem relationship, a driven gear connected to each of said elements for adjusting the same, a driving pinion meshing with each of said gears, and a flexible shaft to which said pinions are secured.

In testimony whereof, I have signed my name to this specification this 8th day of December, 1925.

ROBERT J. MARTIN.