June 28, 1927.

1,633,910

A. E. SHOWALTER ET AL

SHAFT ADJUSTING MECHANISM

Filed May 21, 1926

2 Sheets-Sheet 1

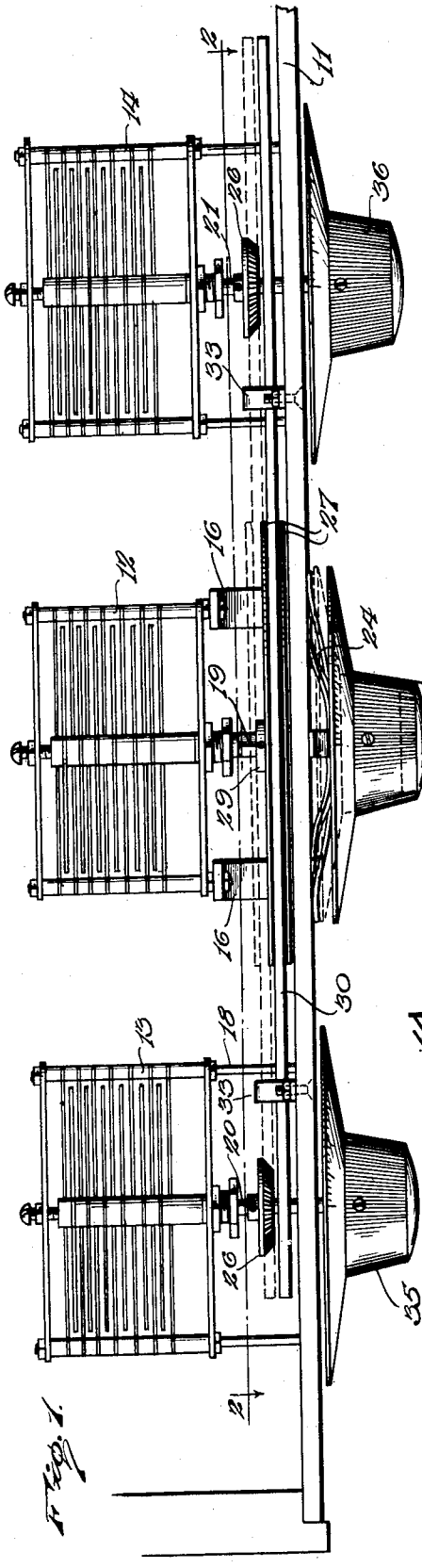


Fig. 1.

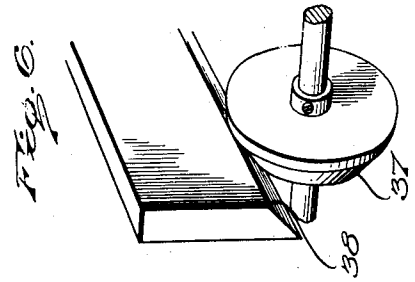


Fig. 6.

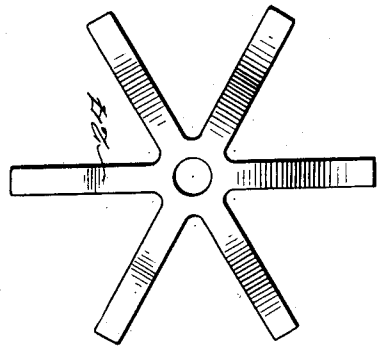


Fig. 4.

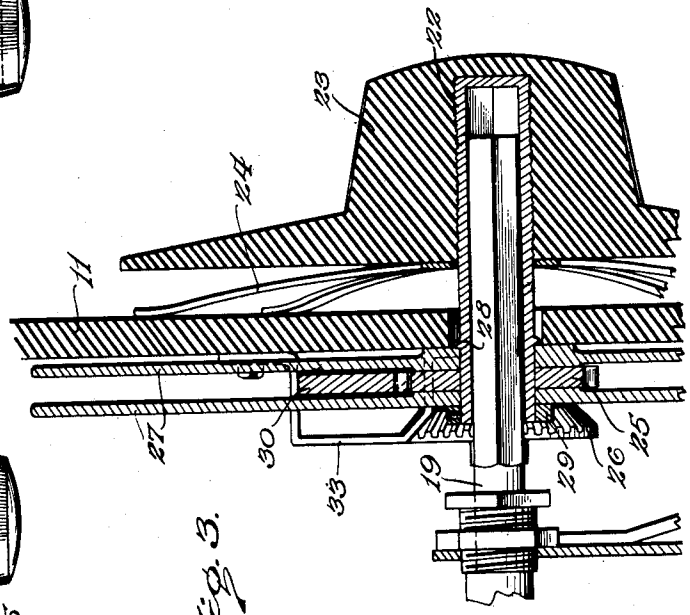


Fig. 3.

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SHAFT ADJUSTING MECHANISM

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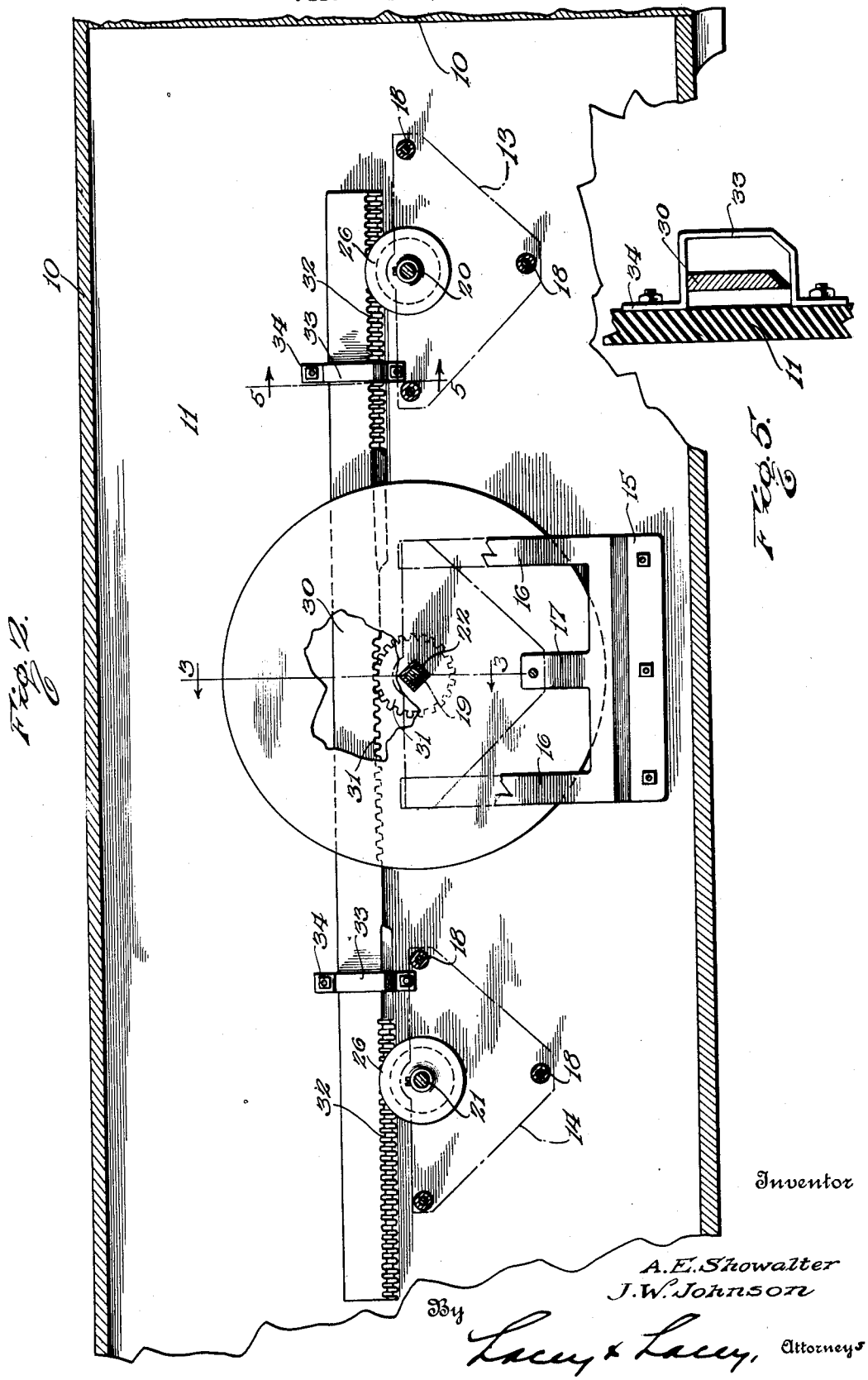


Fig. 2.

Fig. 5.

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UNITED STATES PATENT OFFICE.

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SHAFT-ADJUSTING MECHANISM.

Application filed May 21, 1926. Serial No. 110,743.

This invention relates to an improved shaft adjusting mechanism, being more particularly designed for use in connection with radio receiving sets, and seeks, among other objects, to provide a mechanism peculiarly adapted for rotatably adjusting the rotor shafts of a group of condensers.

The invention seeks, as a further object, to provide a mechanism wherein all of the rotor shafts of a group of condensers may be rotatably adjusted simultaneously in like degree, and wherein each rotor shaft may also be rotatably adjusted separately and individually.

And the invention seeks, as a still further object, to provide a mechanism involving the use of but few and simple parts and which may be readily installed.

Other objects of the invention not specifically mentioned in the foregoing will appear during the course of the following description.

In the accompanying drawings:

Figure 1 is a plan view showing the use of our improved mechanism in conjunction with the condensers of a radio receiving set.

Figure 2 is a vertical sectional view on the line 2—2 of Figure 1, looking in the direction indicated by the arrows.

Figure 3 is an enlarged vertical sectional view on the line 3—3 of Figure 2, looking in the direction indicated by the arrows.

Figure 4 is an elevation of the retracting spring employed.

Figure 5 is a detail sectional view on the line 5—5 of Figure 3, looking in the direction indicated by the arrows.

Figure 6 is a fragmentary perspective view showing a slight modification of the invention.

Referring now more particularly to the drawings, we have shown the cabinet of a radio receiving set at 10. This cabinet includes the usual insulating front panel 11 and mounted upon the panel are condensers 12, 13 and 14. As shown in Figure 3, the condenser 12 is connected with the panel by a substantially E-shaped bracket 15 having long arms 16 to which the side rods of the stator frame are connected, and a short arm 17 to which the bottom rod of the stator frame is connected, the arms being offset for supporting the condenser in spaced relation to the panel. The condensers 13 and 14 are connected with the panel by rods 18 and, as is usual, these condensers are mounted at opposite sides of the condenser 12 in a plane therewith.

As is usual, each of the condensers 12, 13 and 14 includes a group of stationary plates and a group of movable plates, which latter are mounted on a rotor shaft, the rotor shafts of the several condensers being indicated at 19, 20 and 21 respectively. These shafts are freely accommodated through suitable openings in the panel 11 and, as shown in detail in Figure 3, the outer end portion of the shaft 19 is squared. Slidably fitting on the squared outer end of said shaft is a sleeve 22 to which is adjustably fixed a dial or knob 23, and interposed between said dial and the panel 11 is a spider spring 24, the hub of which freely surrounds the sleeve while the bowed radial arms of the spring bear at their free ends against the panel. Accordingly, the spring will normally hold the dial away from the panel.

Fitting the sleeve 22 of the shaft 19 at the inner side of the panel 11 is a pinion 25, and fixed to the shafts 20 and 21 of the condensers 13 and 14 are beveled pinions 26, these latter pinions being adjustably secured in position by suitable set screws. Fitting the inner end portion of the sleeve 22 at opposite sides of the pinion 25 are retaining plates or discs 27, the outermost of which is disposed to abut a shoulder 28 on said sleeve, and fitting the inner end of the sleeve is a collar 29 clamping the plates and said pinion between the collar and the shoulder 28, the collar being adjustably secured to the sleeve by a suitable set screw. Freely received between the plates 27 is a rack bar 30 which, as seen in Figure 2, is provided centrally with teeth 31 to coact with the pinion 25 at its upper side while at its end portions the rack bar is provided with beveled teeth 32 adapted to coact with the beveled pinions 26. Fixed to the panel 11 at its inner side are substantially U-shaped guide members 33 for the end portions of the rack bar. These guide members are, as shown in Figure 3, provided with terminal lugs 34 which are bolted or otherwise secured to the panel so that the guide members will thus limit the rack bar against tilting movement and, as will be observed, the guide members are formed to not only permit endwise movement of the rack bar through the guide members but are also formed to permit lateral movement of the rack bar within the guide members toward and away from the front

panel. Adjustably fixed to the outer end of the shaft 20 of the condenser 13 is a dial or knob 35, and adjustably fixed to the outer end of the shaft 21 of the condenser 14 is a dial or knob 36, these dials being like the dial 23.

As will now be seen in view of the foregoing, the spring 24 will act on the dial 23 for normally holding the sleeve 22 at the limit of its outward movement on the squared outer end of the shaft 19 so that the rack bar 30 will be held by the plates 27 away from the pinions 26, the hub of the inermost of said plates being disposed to abut the panel for limiting the sleeve 22 in its outward movement. Accordingly, the dial 23 may be manually turned for rotatably adjusting the shaft 19 of the condenser 12 independently of the rotor shafts of the condensers 13 and 14, the rack bar 30 sliding through the guide members 33 as the shaft 19 is rotated. Similarly, the dial 35 may be manually turned for rotatably adjusting the shaft 20 of the condenser 13 independently of the rotor shafts of the other condensers, and, likewise, the dial 36 may be manually turned for rotating the shaft 21 of the condenser 14 independently of the rotor shafts of the condensers 12 and 13. Thus, each rotor shaft may be separately and individually adjusted, it being understood, of course, that as the rotor shaft of each condenser is turned, the rotor plates of said condenser will be shifted relative to the fixed plates thereof for varying the capacity of the condenser. To adjust the rotor shafts of all of the condensers simultaneously, the knob 23 is pushed inwardly against the tension of the spring 24, when the rack bar 30 will be shifted laterally inward by the plates 27 to engage at its ends with the pinions 26 so that the rack teeth 32 of the bar will thus be brought into mesh with the teeth of said pinions. Accordingly, when the dial 23 is then turned for rotatably adjusting the shaft 19, the rack bar will be moved endwise by the pinions 25 for correspondingly adjusting the rotor shafts 20 and 21. Thus, the shafts of all of the condensers will be rotatably adjusted simultaneously in like degree. Upon the release of the knob 23, the spring 24 will immediately function to shift the knob outwardly and return the rack bar 30 to its original position, when the rotor shafts may be adjusted separately. In tuning the receiving set, the rotor shafts are preferably first adjusted simultaneously until the rotor plates of the condensers are brought to approximately the desired positions, when the rotor shaft of each condenser is adjusted separately for exact tuning.

In Figure 6 of the drawings, we have illustrated a slight modification of the invention wherein the rotor shafts of the condensers 13 and 14 are each equipped with a clutch cone as typically illustrated at 37 while the rack bar 30 is provided at its ends with beveled clutch faces, as typically indicated at 38, to coact with said cones, so that when the bar is shifted inwardly, in the manner previously described, and the dial 23 is turned for rotatably adjusting the shaft 19 of the condenser 12, the clutch faces 38 of the bar will frictionally coact with the clutch cones 37 for simultaneously adjusting the shafts 20 and 21 of the condensers 13 and 14 in like degree.

Having thus described the invention, what we claim is:

1. In combination with a plurality of shafts for a radio receiver, and means associated with each of the shafts for independent adjustment thereof, one of said means having sliding engagement with its shaft, of a member movable with said sliding means, connecting means between the said member and sliding means for imparting a rectilinear movement to the member as the sliding means is rotated, and cooperating means between the said member and each of the other shafts adapted to be thrown into or out of active engagement by a movement of the said sliding means along its shaft.

2. The combination with a plurality of tuning shafts, elements carried by the shafts for independent rotary adjustment thereof, one of said elements being slidable, and a spring normally holding the sliding element at the limit of its movement in one direction, of an operating member movable with the said slidable element, connecting means between the sliding element and the operating member for imparting a rectilinear movement to the latter, and coacting means between the said operating member and the other shafts adapted to be thrown into or out of action by a movement of the said sliding element on its shaft to admit of simultaneous or independent adjustment of the shafts.

3. An adjusting mechanism of the character described including in combination with a plurality of rotatable shafts, means for adjusting one of said shafts separately, driving elements on the other of said shafts, means movable by said first mentioned means to engage said elements and operable by said first mentioned means for turning said elements and rotatably adjusting the latter shafts simultaneously with the former shaft, and means for rotatably adjusting each of the latter shafts separately.

4. An adjusting mechanism of the character described including in combination with a plurality of rotatable shafts, means for rotatably adjusting one of said shafts separately, driving elements on the other of said shafts, means movable by said first mentioned means to engage said elements and operable by said first mentioned means

for turning said elements and rotatably adjusting the latter shafts simultaneously with the former shaft, yieldable means acting on said first mentioned means for normally holding said second mentioned means in inactive position, and means for rotatably adjusting each of the latter shafts separately.

5. An adjusting mechanism of the character described including in combination with a plurality of rotatable shafts, a sleeve slidable on one of said shafts but rotatable for rotatably adjusting said shaft, driving elements on the other of said shafts, means movable by said sleeve to engage said elements and operable by the sleeve when turned for turning said elements and rotatably adjusting the latter shafts simultaneously with the former shafts, and means for rotatably adjusting each of the latter shafts separately.

6. An adjusting mechanism of the character described including in combination with a plurality of rotatable shafts, a sleeve slidable on one of said shafts but rotatable for rotatably adjusting said shaft, driving elements on the other of said shafts, means movable by said sleeve to engage said elements and operable by the sleeve when turned for turning said elements and rotatably adjusting the latter shafts simultaneously with the former shaft, a spring normally holding the sleeve retracted for maintaining said means out of engagement with said elements, and means for rotatably adjusting each of the latter shafts separately.

7. An adjusting mechanism of the character described including in combination with a plurality of rotatable shafts, a sleeve slidable on one of said shafts but rotatable for rotatably adjusting said shaft, driving elements on the other of said shafts, a pinion carried by said sleeve, a rack bar meshing with said pinion and shiftable by the sleeve to engage said elements for operation by said pinion to turn said elements and rotatably adjust the latter shafts simultaneously with the former shaft, and means for rotatably adjusting each of the latter shafts separately.

8. An adjusting mechanism of the character described including in combination with a plurality of rotatable shafts, and a panel freely receiving the shafts therethrough, a sleeve slidable on one of said shafts but rotatable for rotatably adjusting said shaft separately, a knob carried by the sleeve for turning said sleeve, gears fixed to the other of said shafts, a pinion carried by the sleeve, retaining plates on the sleeve at opposite sides of said pinion, a rack bar held between said plates to coact with the pinion, the sleeve being shiftable for moving said bar into engagement with said gears for operation by said pinion to turn the gears and rotatably adjust the latter shafts simultaneously with the former shaft, a spring interposed between the panel and said knob for normally holding the sleeve retracted and maintaining said rack bar out of engagement with said gears, and knobs on the latter shafts for rotatably adjusting each of the latter shafts separately.

In testimony whereof we affix our signatures.

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