May 22, 1928. 1,670,782

C. PFANSTIEHL

RADIO FREQUENCY AMPLIFIER

Filed June 17, 1926 2 Sheets-Sheet 1

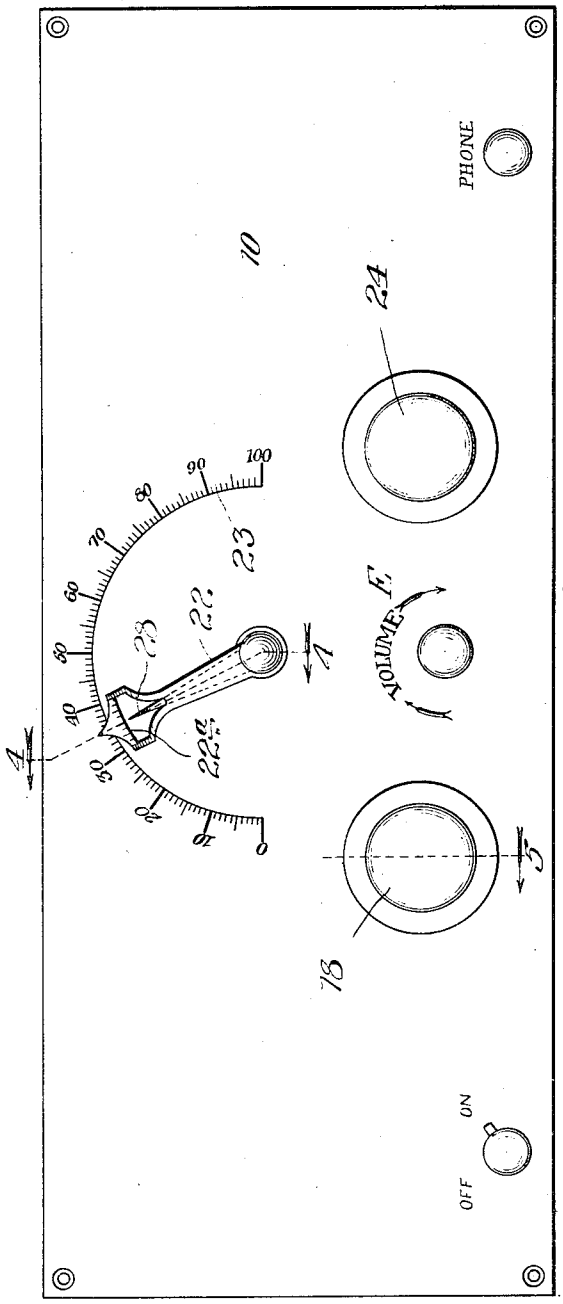


Fig. 1.

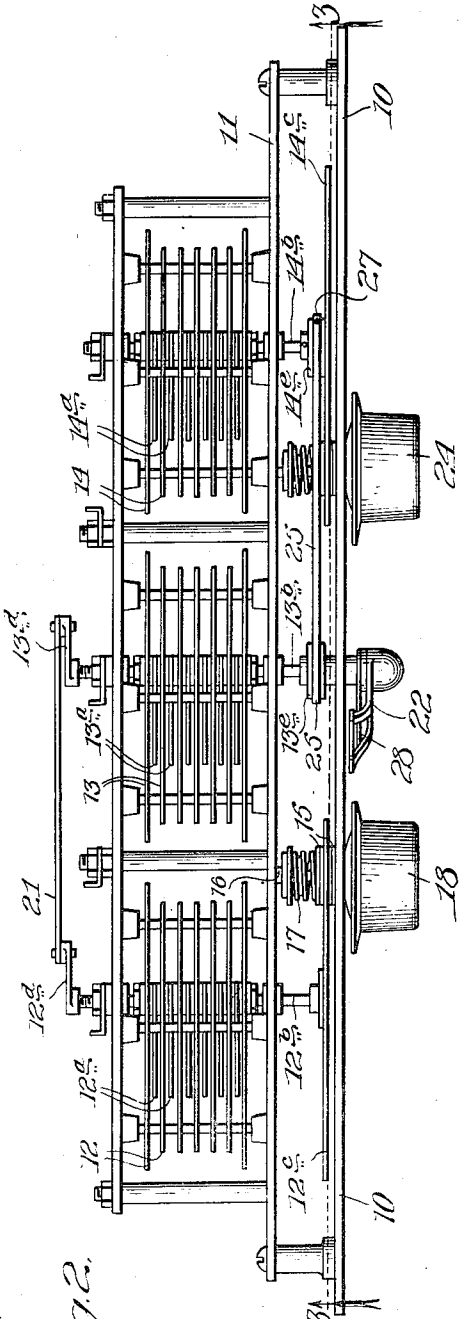


Fig. 2.

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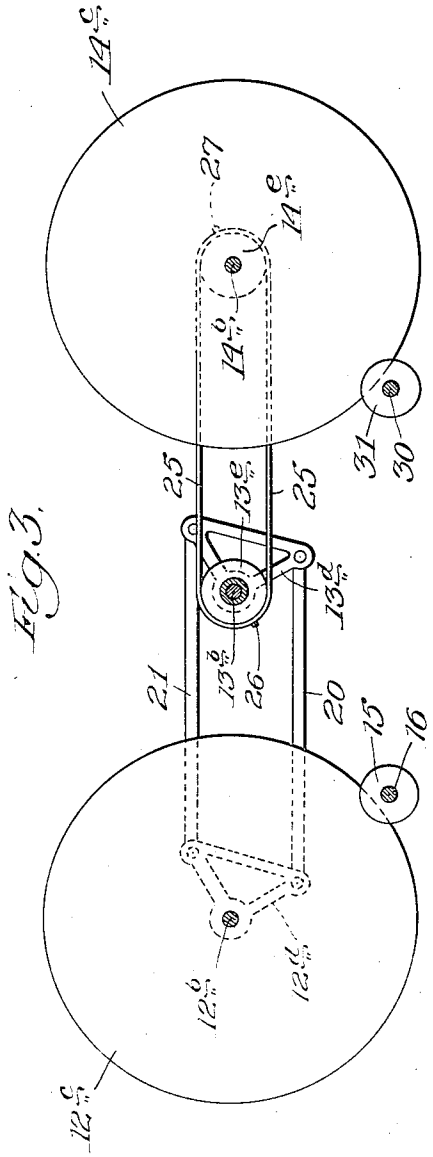


Fig. 3.

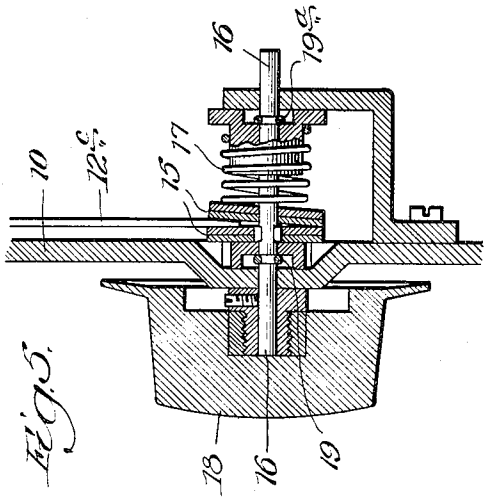


Fig. 5.

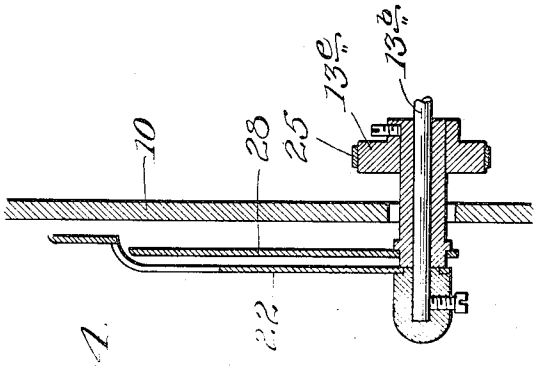


Fig. 4.

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UNITED STATES PATENT OFFICE.

CARL PFANSTIEHL, OF HIGHLAND PARK, ILLINOIS, ASSIGNOR TO PFANSTIEHL RADIO COMPANY, A CORPORATION OF ILLINOIS.

RADIOFREQUENCY AMPLIFIER.

Application filed June 17, 1926. Serial No. 116,558.

This invention relates to radio receiving sets and particularly to the type known as radio-frequency amplifiers wherein the inductance and capacity are substantially the same in the different states of the amplifier so that for any given wave length the condensers are all set to substantially the same position.

The invention is fully described in the following specification and shown in the accompanying drawings, in which:

Figure 1 is a front elevation of the panel of a set embodying the invention:

Fig. 2 is a top plan view of the same showing a series of similar condensers;

Fig. 3 is a diametrical view showing the arrangement for gearing the condensers;

Fig. 4 is a partial enlarged section on the lines 4—4 of Fig. 1; and

Fig. 5 is a similar section on the line 5 of Fig. 1.

The embodiment illustrated comprises a radio receiving set having a panel 10 of bakelite, formica or the like, which is adapted to be secured in a cabinet (not shown). On the back of this panel is secured the frame 11 carrying a series of condensers 12, 13 and 14 of the well known rotatable type. These have rotors 12^a, 13^a and 14^a respectively mounted upon condenser shafts 12^b, 13^b and 14^b.

A thin disk 12^c of celluloid or the like is secured at the end of the shaft 12^b just back of the panel 10 and a similar disk 14^c is secured to the shaft 14^b.

The disk 12^c is turned by means of circular gripping plates 15 as shown in Fig. 5, which are mounted on a shaft 16 and pressed against the disk 12^c by means of a spring 17. A knob 18 is secured at the outer end of the shaft 16 which projects through the panel 10. The pressure of the spring 17 is taken by the snap rings 19 and 19^a which fit into annular grooves on the shaft 16. From the foregoing it will be understood that as the knob 18 is turned, the gripping plates 15 will rotate the disk 12^c together with the rotor of the condenser to which it is connected.

At the same time the shaft 12^b is connected to the shaft 13^b as shown in Fig. 3, by means of bell-cranks 12^d and 13^d which are pivotally connected together by links 20 and 21. The middle shaft 13^b extends through the panel 10 as shown in Fig. 4 and carries a pointer 22 which operates over the scale 23 as shown in Fig. 1. Thus the knob 18 controls the rotors 12^a and 13^a of the condensers 12 and 13, and the positions of these which are at all times at substantially the same positions are shown by the pointer 22 on the scale 23.

The rotor 14^a of the condenser 14 is likewise turned by the knob 24 acting through the disk 14^c to turn the shaft 14^b. The pulley 13^e is mounted to rotate on the shaft 13^b and a pulley 14^e is secured to the shaft 14^b, and these pulleys are belted together by means of a thin strip of brass or the link 25 which is secured to these pulleys by pins 26 and 27. This prevents relative movement of the pulleys 13^e and 14^e, and insures that any movement of either produces the same angular movement in the other, the pulleys 13^e and 14^e being of the same diameter. On the outer end of the hub of the pulley 13^e is secured a pointer 28 which is so set as to show the relative position of the rotor 14^a with respect to the rotors 12^a and 13^a.

With the pointers 22 and 28 set at the same position as in Fig. 1 when the rotors are all at this same corresponding position, they will all be together at any point in the scale, where the pointers 22 and 28 are also together as shown in Fig. 1.

The rotor 14^a is turned by means of the knob 24 acting through the shaft 30, the gripping plates 31 and the disk 14^c as shown in Fig. 3 which corresponds to the parts 16, 15 and 12^c previously described.

In tuning the set, particularly where the operator is "hunting" for a station, the location of which he is not certain of, the operator will manipulate the knobs 18 and 24 simultaneously and rather slowly in such a way as to keep the pointer 28 at the center of the small scale 22^a of the pointer 22. Thus all the condensers are simultaneously varied and kept substantially in tune with each other. The fact that the operator has the two pointers so close together permits him to move them across the dial, at the same time keeping them about together. This is made possible by the fact that both pointers are so close together that the operator's eye is able to observe both at once as they pass across the dial. Thus all three condensers are simultaneously tuned for substantially the same wave length so that relatively weak signals are easily picked up. When the op-

erator succeeds in picking up such a signal he can then manipulate the knobs 18 and 24 singly to the position where he receives the signal with maximum intensity and clearness. This is preferably done by first setting the pointer 22 to the best position for reception and then setting the pointer 28.

While I have shown and described but a single embodiment of this invention, it is to be understood that it is capable of many modifications. Changes therefore in the construction and arrangement may be made which do not depart from the spirit and scope of the invention as disclosed in the appended claims.

I claim:

1. In radio apparatus, a plurality of tuning elements movable to substantially the same relative positions, a scale, a pointer movable on said scale and movably connected to one of said tuning elements, a second pointer movable about the axis of the first pointer and connected to another of said tuning elements so that the relative positions of said tuning elements may be seen from the positions of said pointers, one of said pointers carrying a small scale over which the other pointer operates.

2. In radio apparatus, two shafts, each operably connected to a piece of tuning apparatus, a pointer on one of said shafts, a scale over which said pointer is adapted to move, a small scale carried by said pointer, and a second pointer operably connected to the other of said shafts and adapted to move over said small scale.

3. In radio apparatus, two shafts, each operably connected to a piece of tuning apparatus, a pointer on one of said shafts, a scale over which said pointer is adapted to move, a small scale carried by said pointer, a second pointer operably connected to the other of said shafts and adapted to move over said small scale, and means remote from said pointers for controlling said shafts.

4. In apparatus of the class described, two shafts having the same axis, a pointer on one of said shafts, a small scale carried by said pointer, and a second pointer carried by the other shaft and movable over said small scale.

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