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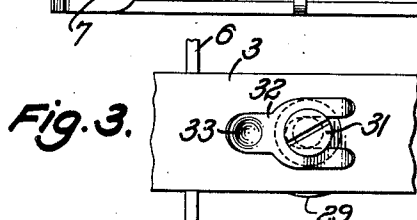
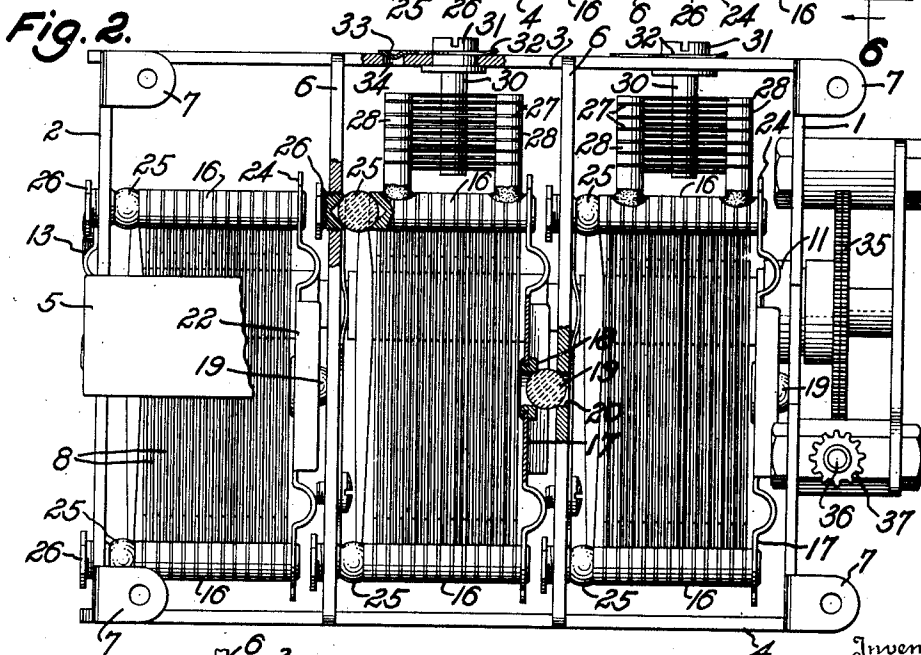
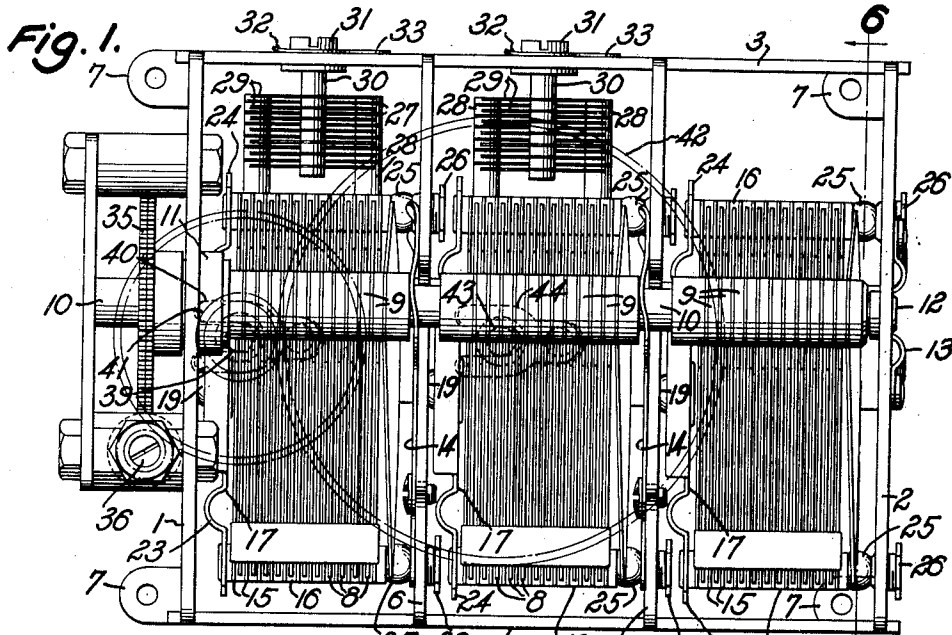
F. H. DRAKE

2,282,215

CONDENSER

Filed April 11, 1939

2 Sheets-Sheet 1



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Frederick H. Drake,

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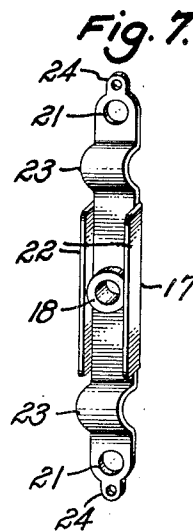
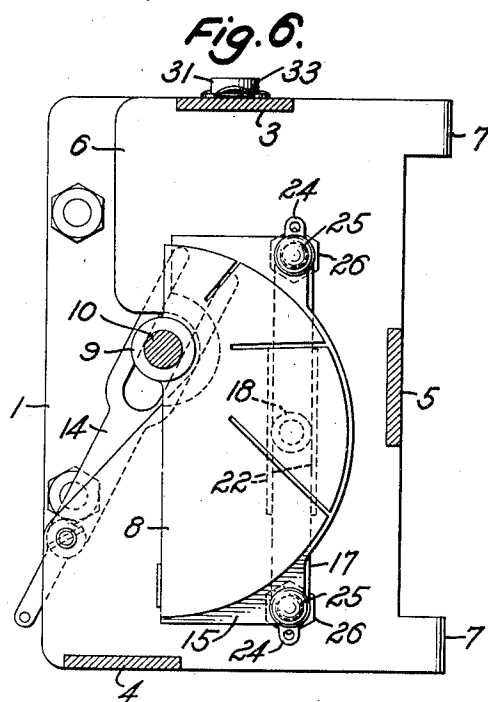
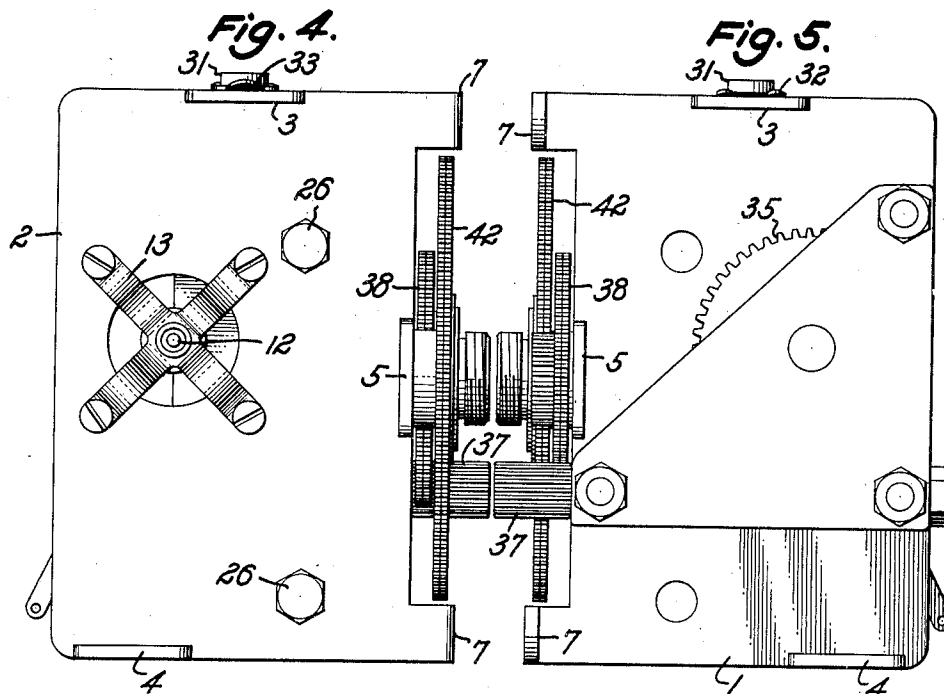
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2 Sheets-Sheet 2



Inventor:

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UNITED STATES PATENT OFFICE

2,282,215

CONDENSER

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Application April 11, 1939, Serial No. 267,280

2 Claims. (Cl. 175—41.5)

This invention relates to condensers and particularly to air condensers of the multiple plate type such as used in radio circuits.

An object of the invention is to provide air condensers having a novel mechanical system for supporting an adjustable air-insulated trimming condenser between the insulated assembly of main stator plates and the condenser frame upon which the other set of main condenser plates is grounded. An object is to provide an air condenser in which a main stator assembly includes bars that are substantially parallel to the side rails of a frame, and a trimming condenser is supported on and between a bar of the stator assembly and the adjacent side bar of the frame. More specifically, an object is to provide a condenser of the type stated in which the rotor assembly of the trimming condenser includes a stem extending through and secured to the side rail by a forked resilient member.

These and other objects and advantages of the invention will be apparent from the following specification when taken with the accompanying drawings in which:

Fig. 1 is a top plan view of a gang tuning condenser assembly embodying the invention;

Fig. 2 is a bottom plan view of the same, parts of the gearing for adjusting the condenser being broken away for the better illustration of the supports for the stator plates;

Fig. 3 is a fragmentary side elevation of the condenser frame and a mounting for a rotor of one of the trimming condensers;

Figs. 4 and 5 are elevations of opposite ends of the gang condenser;

Fig. 6 is a transverse sectional view on line 6—6 of Fig. 1; and

Fig. 7 is a perspective view of the resilient supporting member of a stator assembly.

In the drawings, the reference numerals 1, 2 identify the opposite end plates of a gang condenser frame that includes side rails 3, 4, a bottom rail 5, and division plates 6 between the adjacent condenser sections. Lugs or apertured ears 7 are provided on the end plates for securing the condenser frame to a chassis. The rotor plates 8 are secured to sleeves 9 on a shaft 10 that is supported by a hub 11 on the end plate 1 and an end bearing 12 that is mounted on the end plate 2 by a resilient member 13. Resilient grounding strips 14 secured to the intermediate plate 6 have inner ends bearing against the sleeves 9 of the forward condenser sections and outer ends to which ground leads may be soldered.

As shown in Figs. 1 and 2, the stator plates 15

of each unit are secured to bars or rails 16 that are each recessed at one end and have a resilient mounting strip 17 secured to and extending between their opposite ends. A bushing 18 is secured to the midsection of each mounting strip 17 to form a seat for an insulating ball 19, preferably of oven glass of the type sold under the trade-mark "Pyrex," that rests in an opening 20 in the adjacent transverse member 1 or 6 of the condenser frame. The resilient mounting strips 17 have openings 21 for receiving the ends of the rails 16, and the latter are spun over or otherwise secured to the strips 17. Flanges 22 render the central sections of the strips relatively rigid and the curved or semi-cylindrical sections 23 of the strips provide the required resiliency that eliminates play in the assembly. Both ends 24 of each strip 17 are preferably formed as soldering tips for making electrical connections to the stator unit.

At the opposite face of each stator unit, insulating members 25, preferably balls of "Pyrex" glass or other insulating material, are clamped between the sockets in the ends of the rails 16 and cap screws 26 that are threaded into the adjacent transverse members 6 or 2 of the insulator frame. The compressive strength of glass balls is quite high when mounted in conical sockets and the resilient strips 17 may therefore be relatively stiff to exert sufficient pressure upon the balls to eliminate all play and to maintain the plates 15 normal to the plane through the balls 19 and 25. Adjustment of either cap screw 26 rocks the stator about an axis through the center of the ball 19 and normal to the plane through the balls, and a simultaneous adjustment of both cap screws 26 in the same sense results in a displacement of the stator assembly parallel to the axis of the rotor shaft 10.

The stator plates 27 of trimming condensers for certain of the condenser sections are carried by posts 28 that are soldered or welded to a bar 16 of the stator assembly of the associated condenser section. The condenser assembly may be adjusted angularly within the condenser frame but the range of adjustment is relatively small and the bars 16 are approximately parallel to the side rails of the frame when the stator sections are adjusted to an "electrically centered" position. The rotor section of the trimming condensers may therefore be mounted on the frame as the stator plates 27 are substantially parallel to the side rail 3. The rotor plates 29 are carried by a stem 30 having a slotted head 31 passed through the side rail 3 of the frame and secured thereto by

a forked resilient member 32 having an end projection 33 that is indented to seat in an aperture 34 in the rail 3. An angular adjustment of a main stator section is accompanied by an angular adjustment of the stator plates 27 of the associated trimming condenser, but an axial adjustment of a main stator section moves the trimming stator assembly parallel to the rotor plates 29.

The angular adjustment of the shaft 10 may be effected by any appropriate mechanism. As shown in Figs. 1 and 2, a two-part gear 35 of known non-lash type is secured to the forward end of the shaft 10 for meshing with a worm gear, not shown, on the control shaft 36. The shaft 36 carries a gear 37 that meshes with a gear 38 on a shaft 39 that is detachably secured to the rail 5 by a spring clip 40. Shaft 39 has a second gear 41 in mesh with gear 42 on the shaft 43 that is secured to the rail 5 by a clip 44. The described gears provide a slow motion drive for an indicating pointer, not shown, that may be attached to the shaft 43.

The stator sections of the condenser sections are assembled by placing an insulating ball 19 in the seat 20 of the frame, placing balls 25 in the sockets of the bars 16 and adjusting the cap screws 26 to clamp the stator in position on the frame. The stator sections are adjusted to an "electrically centered" position relative to the corresponding rotor sections by first turning the rotor sections into a position of maximum capacity and then adjusting cap screws 26 on each

section to obtain a minimum capacity. These cap screw adjustments in any one section will be substantially independent electrically and entirely independent mechanically so that the condenser units are adjustable quickly and accurately to correct alinement.

It is therefore to be understood that there is considerable latitude in the design and construction of devices that fall within the spirit of my invention as set forth in the following claims.

I claim:

1. In a condenser, a frame including side rails joined by transverse members, a pair of parallel bars and stator plates secured thereto to form a main stator section, adjustable means cooperating with said bars to support said main stator section upon said frame and with said bars substantially parallel to said side rails of the frame, a trimming condenser stator section comprising stator plates parallel to a side rail and carried by posts secured to one of said bars, said posts being perpendicular to the supporting bar and to the side rails, and a rotor assembly for the trimming condenser comprising a stem extending through a side rail of the frame and carrying rotor plates.

2. In a condenser, the invention as claimed in claim 1, wherein said rotor assembly includes a forked resilient member engaging said stem to secure the same to the side rail of the frame.

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