

April 11, 1939.

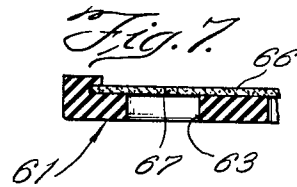
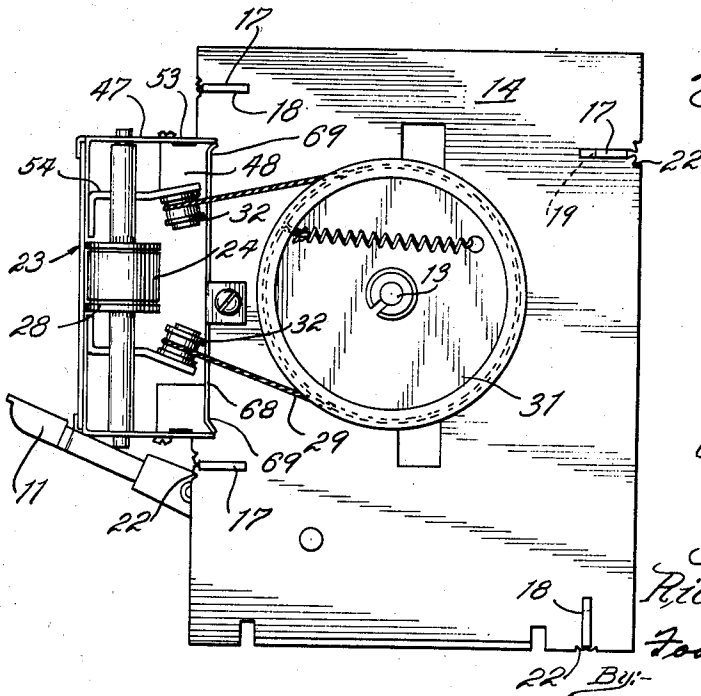
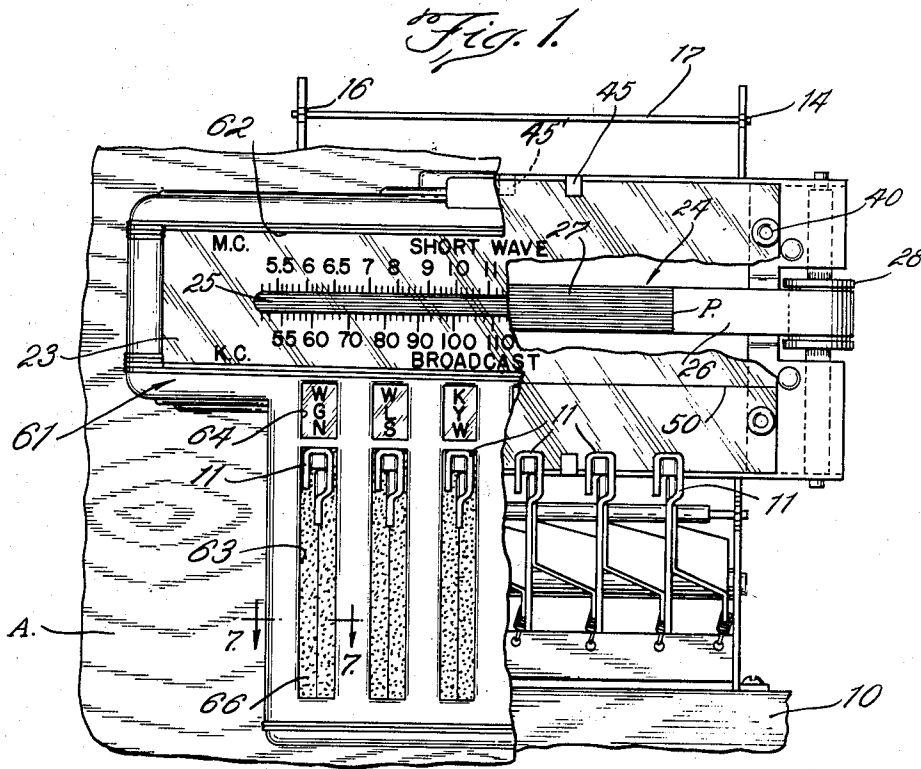
R. C. MARHOLZ

2,154,406

SUPPORTING STRUCTURE FOR RADIO INDICATING AND CONTROL APPARATUS

Filed Nov. 30, 1937

5 Sheets-Sheet 1



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April 11, 1939.

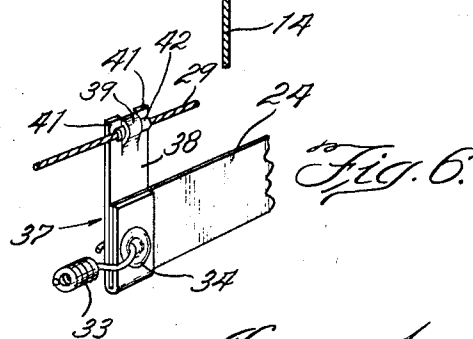
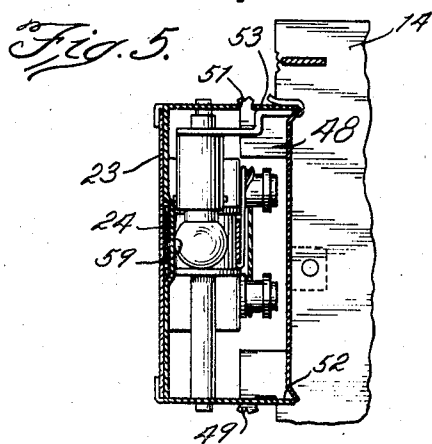
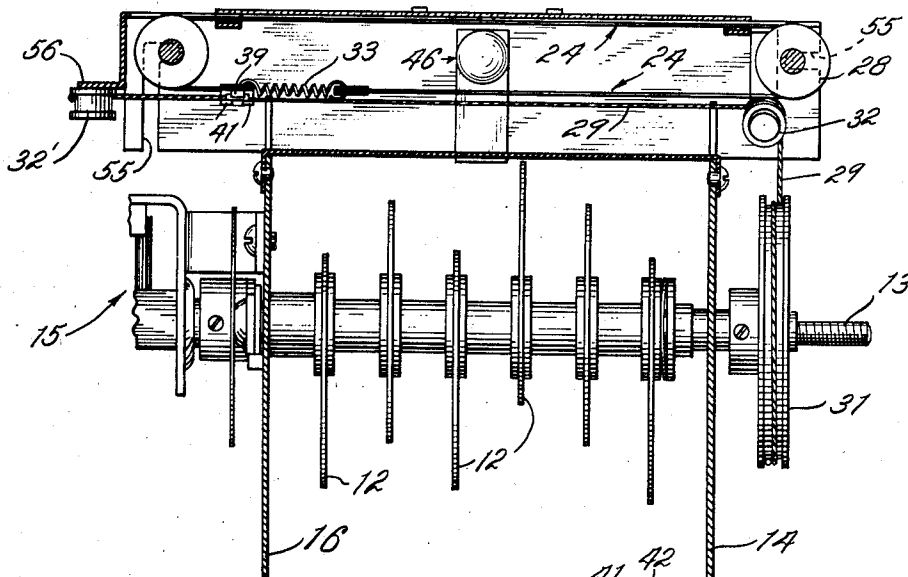
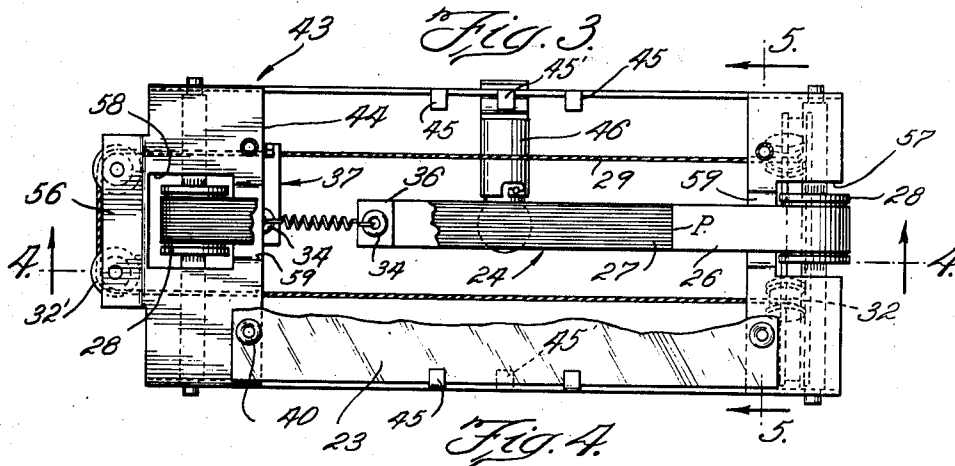
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2,154,406

SUPPORTING STRUCTURE FOR RADIO INDICATING AND CONTROL APPARATUS

Filed Nov. 30, 1937

5 Sheets-Sheet 2



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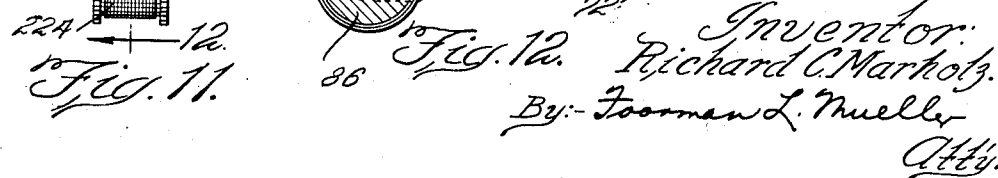
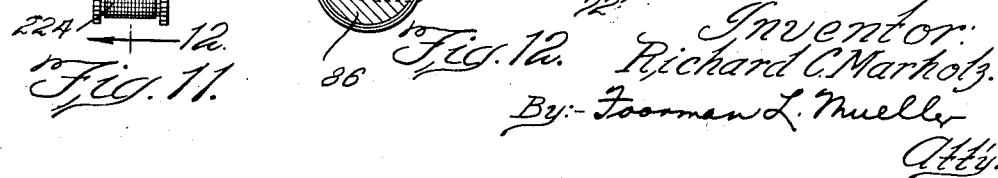
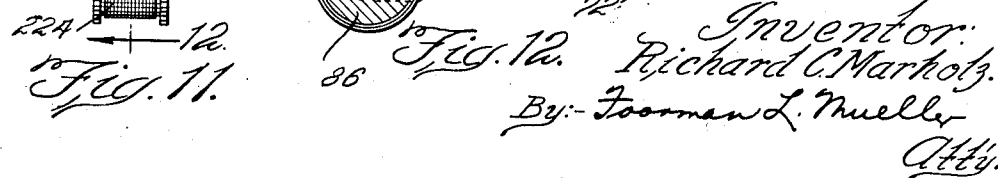
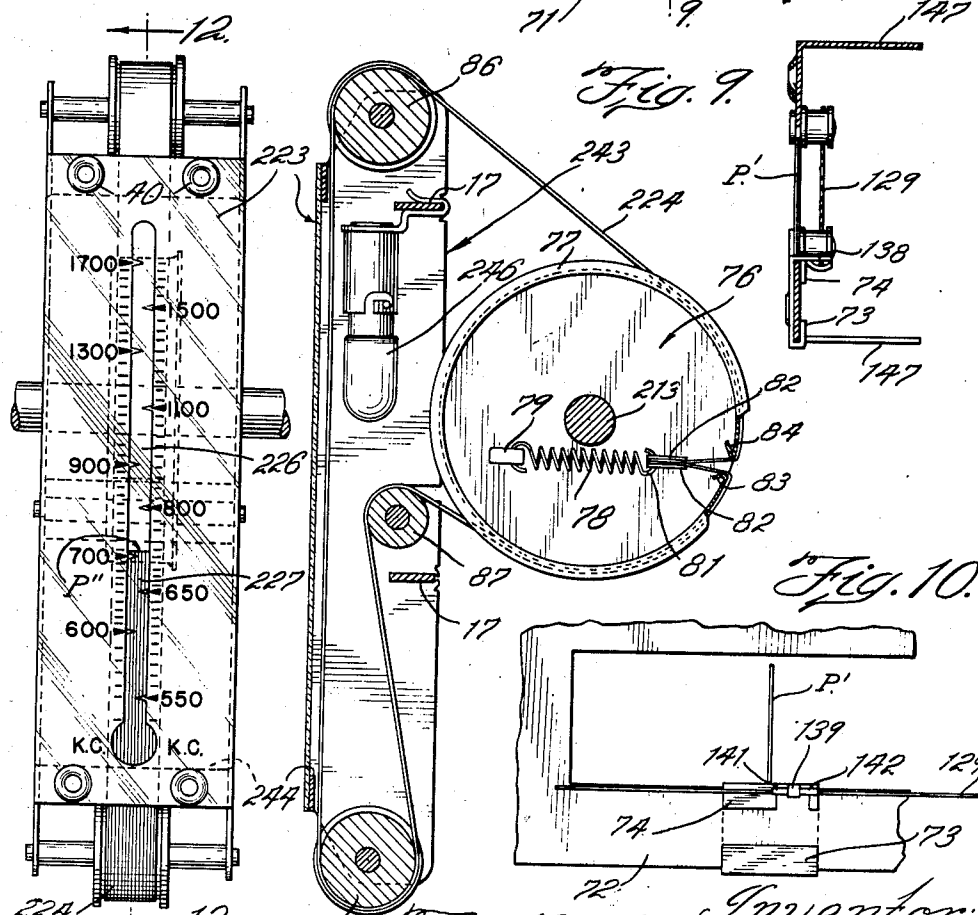
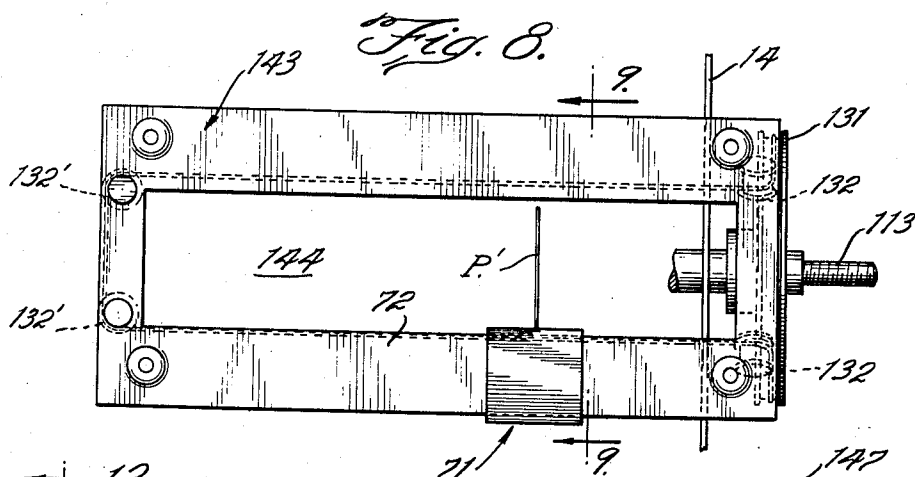
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SUPPORTING STRUCTURE FOR RADIO INDICATING AND CONTROL APPARATUS

Filed Nov. 30, 1937

5 Sheets-Sheet 3



April 11, 1939.

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2,154,406

SUPPORTING STRUCTURE FOR RADIO INDICATING AND CONTROL APPARATUS

Filed Nov. 30, 1937

5 Sheets-Sheet 4

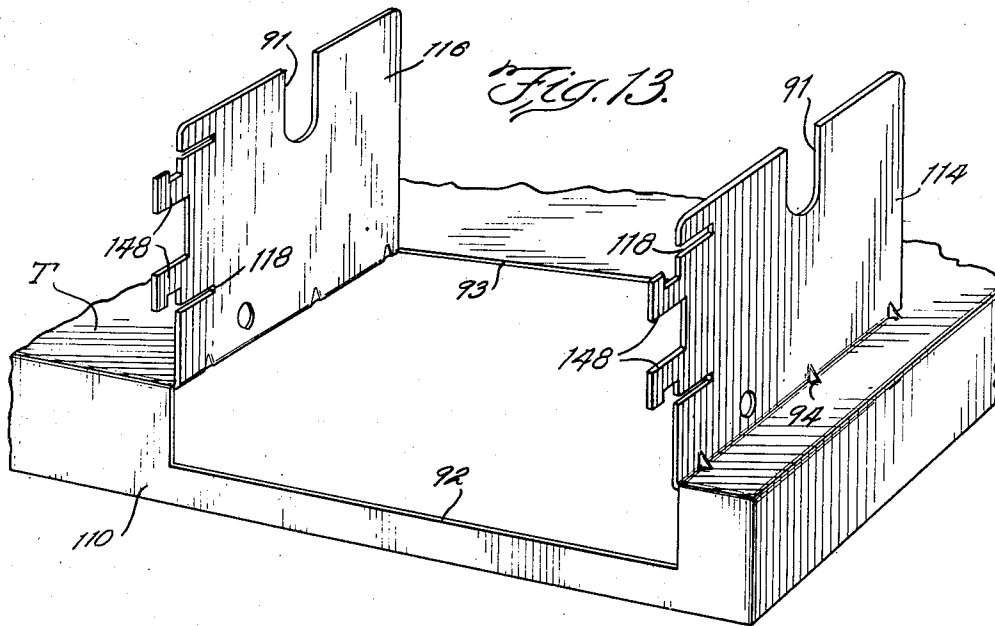


Fig. 14.

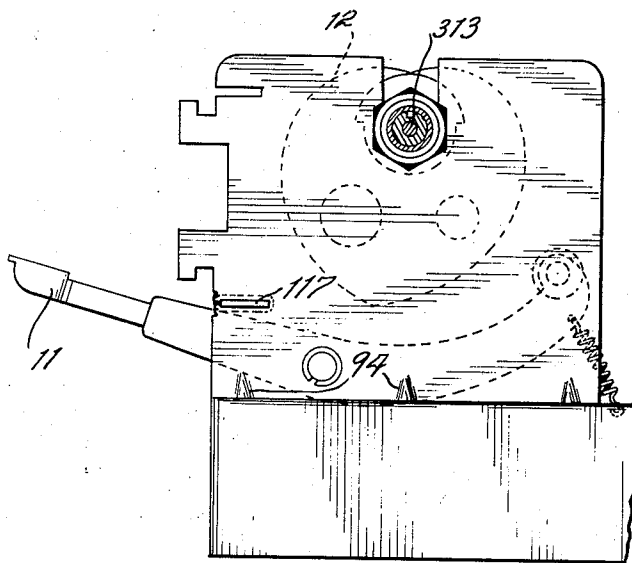


Fig. 15.

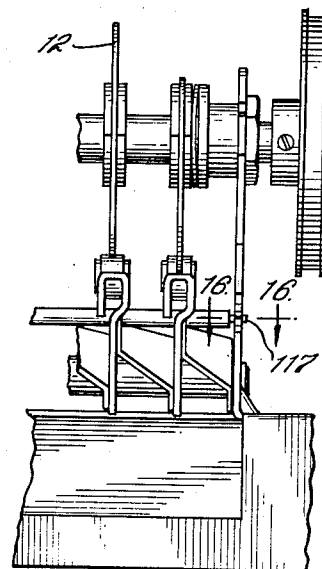
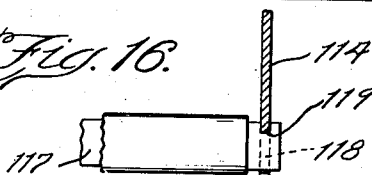


Fig. 16.



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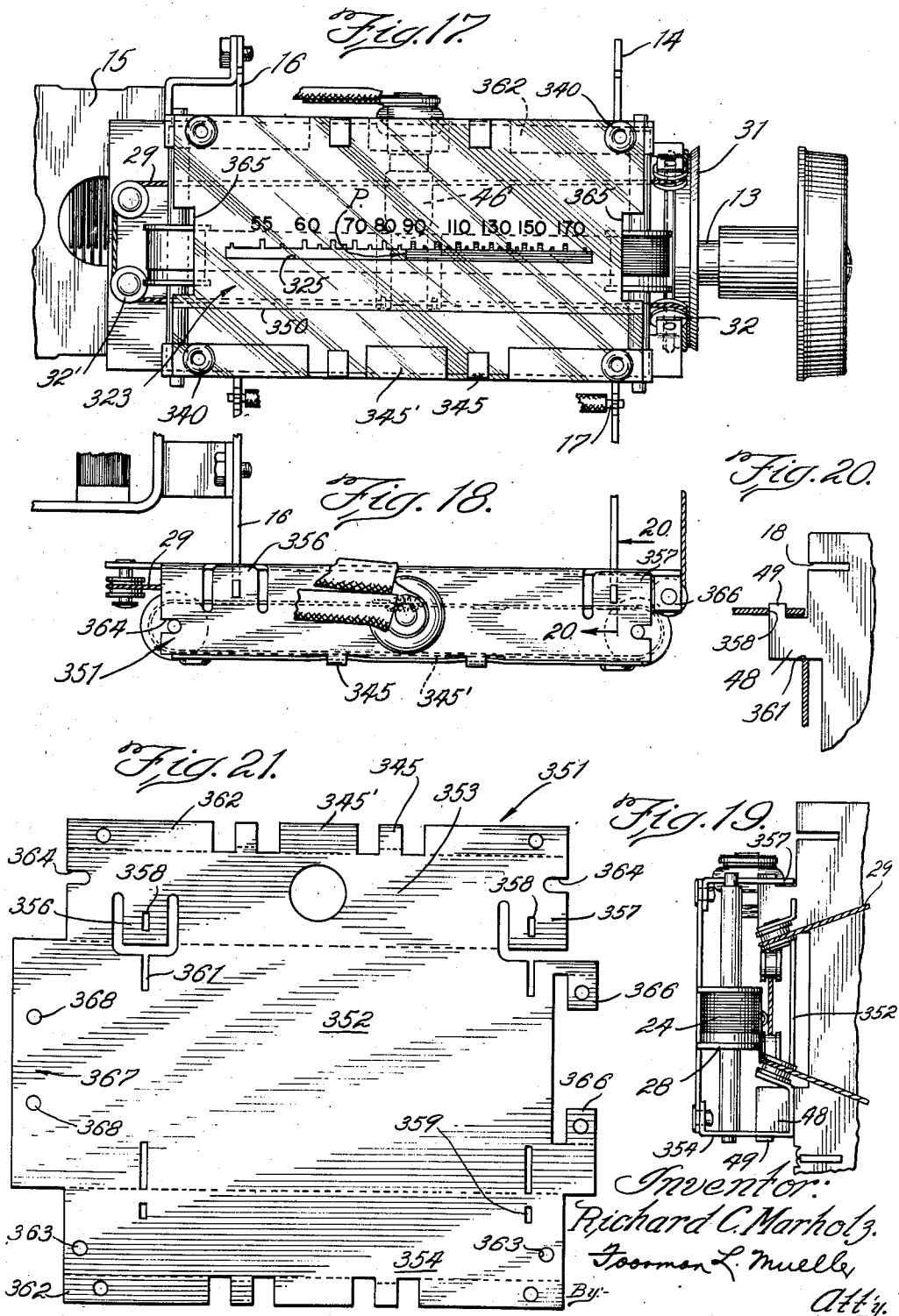
R. C. MARHOLZ

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SUPPORTING STRUCTURE FOR RADIO INDICATING AND CONTROL APPARATUS

Filed Nov. 30, 1937

5 Sheets-Sheet 5



UNITED STATES PATENT OFFICE

2,154,406

SUPPORTING STRUCTURE FOR RADIO INDICATING AND CONTROL APPARATUS

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corporation of Illinois

Application November 30, 1937, Serial No. 177,287

10 Claims. (Cl. 250—16)

My invention relates in general to radio receiving apparatus, and more in particular to indicating apparatus for radio receivers and frame structure for said indicating apparatus and the control apparatus in connection therewith.

Although the various embodiments of my invention are illustrated herein in connection with a cam and lever tuning device such as is covered by the copending application of Alexander W. Plensler Serial No. 170,070, now Patent No. 2,130,153 issued Sept. 13, 1938, this is merely illustrative and it will be understood that the invention hereinafter described may be adapted to any type of control mechanism including the ordinary knob tuning, and manual and electrical automatic tuning mechanism for radio receivers.

It is an object of my invention to provide simplified and improved indicating apparatus and the frame structure therefor for use with control or operating mechanism for a radio receiver.

A further object of my invention is to provide indicating apparatus for a radio receiver to be operated in direct ratio to the movement of the tuning mechanism therefor without intermediate expensive gearing, which apparatus is extremely simple and inexpensive yet neat and novel in appearance.

A still further object of my invention is the provision of improved indicating apparatus with a direct-reading straight-line vertical or horizontal tuning scale.

It is also an object of my invention to provide complete indicating apparatus and frame structure cooperating therewith which all together not only has marked functional advantages but also adds materially to the pleasing appearance of the front of a radio cabinet even to the extent that it is the most novel and attractive portion of the radio receiver.

A feature of my invention is the provision of indicating apparatus and frame structure which readily adapts itself to control mechanism for a radio receiver, with the adaptation equally successful from an operating standpoint as well as from a manufacturing and assembly standpoint.

Another feature of my invention is the provision of control apparatus for a radio receiver which may all be preassembled as a rigid, compact unit substantially without independent securing means but relying upon the configuration and disfiguration of the elements of said apparatus themselves.

A further feature is the provision of a frame structure in combination with the indicating ap-

paratus and acting to support control mechanism in connection therewith, which provides a simple and rugged assembly composed primarily of inexpensive stamped elements which can very easily be adapted to many variations in cabinet and radio receiver chassis design.

A still further feature of my invention is the provision of elements in the frame structure for the indicating and control apparatus for a radio receiver which may be assembled together with a minimum number of securing parts, relying almost entirely for such fastening upon the configuration of the elements themselves, and utilizing some of the material of the elements for accomplishing such fastening as by upsetting and peening.

Other objects and features of the invention will be apparent from the following description taken with the drawings in which:

Fig. 1 is a fragmentary elevation of the front of a radio receiver cabinet with the escutcheon, indicating and frame structure of one embodiment of my invention, the escutcheon being broken away to make portions of the latter mechanism visible.

Fig. 2 is an end elevation of the structure of Fig. 1.

Fig. 3 is a front elevation of the indicating apparatus with the escutcheon plate and dial of Fig. 1 removed.

Fig. 4 is a sectional view along the line 4—4 of Fig. 3 looking in the direction of the arrows shown therein.

Fig. 5 is a fragmentary vertical section along the line 5—5 of Fig. 3.

Fig. 6 is a fragmentary view in perspective of the pulley cord and indicating ribbon structure visible in Figs. 3 and 4.

Fig. 7 is a fragmentary section of the escutcheon plate of my invention along the line 7—7 of Fig. 1.

Fig. 8 is a front elevation of the indicating pointer and frame of a modified embodiment of the indicating structure of my invention.

Fig. 9 is a vertical sectional view along the line 9—9 of Fig. 8.

Fig. 10 is a fragmentary rear view in elevation of the pointer and frame structure of Fig. 8.

Fig. 11 is a front elevation of a further modification of the indicating apparatus of my invention.

Fig. 12 is a vertical sectional view along the line 12—12 of Fig. 11.

Fig. 13 is a perspective view of a chassis and integral end support plates of the frame for the

indicating and control apparatus of my invention.

Fig. 14 is an end elevation of the frame of Fig. 13 with control apparatus mounted thereon.

5 Fig. 15 is a fragmentary front view of the structure of Fig. 14.

Fig. 16 is an enlarged fragmentary view of the notched structure for dovetailing elements of the frame structure together. This view is taken along the line 16—16 of Fig. 15.

10 Fig. 17 is a modified embodiment of the frame for the horizontal indicating structure of my invention on a fragmentary portion of the main frame structure of Fig. 1.

15 Fig. 18 is a fragmentary top plan view of the device of Fig. 17.

Fig. 19 is a fragmentary end elevation of the structure of Fig. 17.

20 Fig. 20 is a fragmentary sectional view along the line 20—20 of Fig. 18.

Fig. 21 is a blank in actual size, of the one-piece frame for the dial and indicating structure of Fig. 17.

In the embodiment of my invention as illustrated in Fig. 1, a fragmentary portion of a radio receiver chassis 10 is illustrated with indicating and control apparatus mounted thereon. This apparatus comprises a plurality of movable levers 11 selectively depressible to engage and move 30 corresponding cams 12 (Fig. 14) suitably secured on the rotating shaft 13. A tuning condenser 15 (Fig. 4) is connected to the shaft. The shaft is journaled in a pair of end plates 14 and 16 rigidly secured to the chassis 10 and supported in 35 rigid and fixed position with respect to one another by means including a plurality of longitudinal bars 17 at the front and back of the frame. Each of the bars 17 fits into corresponding slots or notches 18 in the end plates 14 and 40 16 of the frame. Each of these bars is provided with a notch 19 (or 119—Fig. 16) which fits over the wall portion 21 of the end plates for the frame. This dovetailed construction retains the bars and frame plates in rigid lateral relationship, and this position is maintained upon locking the bars in the notches 18 by peening or upsetting the edge of the frame to each side of the opening for slot 18 as shown clearly at 22 in Fig. 2. The peening operation is accomplished quickly and inexpensively and eliminates the necessity of rivets, bolts or the like requiring extra handling in order to secure these members together. Inasmuch as considerable pressure is exerted upon the levers 11 to depress them for 50 manual tuning, it is extremely important that the frame for the indicating and control apparatus be extremely rugged in itself and fixed with respect to the chassis 10 for the radio receiver with which this apparatus is connected. 60 It is understood that the same ruggedness and rigidity for any type of control apparatus is desirable, and the invention is not confined to the combination with the cam and lever mechanism.

65 The tuned position of the radio receiver is indicated on a dial 23 supported on a frame or panel which in turn is carried by the frame plates 14 and 16. Indicating mechanism co-operating with the dial includes a ribbon or band 70 24 provided in two different colors as at 26 and 27 with a sharp line of division as indicated at P in Fig. 1. That is, the line P is the dividing line between the contrasting colors and serves as the reference point for station indication. The 75 ribbon may be provided in various materials all

of which must desirably be relatively strong, capable of retaining color satisfactorily, and preferably not adversely affected by heat. The ribbon 24 with the line P formed by the contrasting colors moves horizontally in a viewing 5 path, and a return path on a pair of rollers 28 journaled in the dial frame. The line P formed by the contrasting colors moves to the rear of the dial 23 and is visible through a slot or transparent portion 25 having a tuning scale to each 10 side thereof. Movement of the ribbon itself is accomplished by means of a cord 29 on the pulley 31, which latter is keyed or secured to the shaft 13 and rotatable upon movement of one of the control levers 11 to rotate its corresponding cam 12. The cord 29 extends from the pulley 31 over a plurality of small pulleys 32 (on the right as viewed in Fig. 3), and 32' (on the left), all mounted in such a position 15 that the cord passing thereover lies substantially above the returned portion B of the indicating ribbon 24. The position of this portion will vary but will always be in the return path.

The ribbon 24 is maintained taut around the pulleys by means including a coiled spring 33 25 hooked into eyelets 34 on folded ribbon clamps 36 and 37. Clamp 36 is merely a U-shaped piece of metal pinched over the end of the ribbon and secured thereon by means of the eyelet 34. The member 37, however, (Fig. 6) comprises a U- 30 shaped member pinched over the opposite end of the ribbon 24 and extending vertically through an extension 38 having a stamped out ear 39 therein. The latter is originally opened in a substantially Y-shaped configuration with the 35 corresponding projections 41 of the member adapted to receive the cord 29 therein, and then with the ear 39 pressed to the position shown in Fig. 6 acting to oppositely retain the cord in the clamp at that point thereon. To prevent 40 cutting of the cord 29 by the ear and corresponding projections 41, a piece of "spaghetti" or insulating tubing 42 well-known in the electrical art is slipped over the cord at that portion prior to its insertion in the clamping member 37. With 45 this structure, it is obvious that the ribbon 24 moves horizontally upon any movement of the cord 29 around the pulley 31.

The dial frame supported upon the end plates 14 and 16 comprises a one-piece channeled frame 50 43 with an enlarged viewing aperture 44 centrally thereof to permit satisfactory illumination for the dial. Such illumination is provided from a pilot lamp 46 mounted on one of the two rearwardly extending portions or flanges 47 of the dial 55 frame. The dial plate 23 is principally secured on the outside of its dial frame 43 by means of rivets or the like 40. When using dials provided in composition materials there is some possibility of warping of the same over the relatively long 60 expanse from the rivets at each end. To prevent this warping, staggered lugs 45 and 45' (Figs. 1 and 3) are provided at the top and bottom of the aperture 44. The lugs 45 are positioned in front of the dial 23, the lugs 45' to the rear, and 65 all cooperate to maintain the dial in a straight-line configuration.

The mounting for the channeled dial frame is most clearly shown in Fig. 5, and includes integral ears 48 extending forwardly from each of 70 the end plates 14 and 16. A stud 49 on each of the ears 48 extends vertically to engage in a corresponding aperture 51 and the horizontal flanges on the dial frame, while notches 52 aligned with the apertures 51 in the frame flanges 47 fit over 75

the edge of the end plates 14 and 16 similar to the notch and frame construction described with respect to the bars 17. A bridge portion 53 intermediate the aperture 51 and the notch 52 lays against a corresponding portion on the ear 48 to limit any possible vertical movement of the dial frame with respect to the end plates 14 and 16. The flanges 47 are sprung upwardly and downwardly and pressed toward the end plates until the studs 49 project into the apertures 51. The studs 49 are then peened, particularly as shown in Figs. 2 and 5 to lock the flanges 47 onto the ears 48.

The pulleys 32 are supported upon appropriate brackets 54 as shown in Fig. 2 secured to the front of the dial frame, while the pulleys 32' are rotatably mounted upon an integral flange 56 extending outwardly from the opposite end of the dial frame as shown in Figs. 3 and 4. In order to carry the ribbon 24 as close to the dial 23 as possible, the pulley 28 at the right-hand end of the dial frame, as viewed in Figs. 1, 3 and 4, is rotatably mounted outwardly from the corresponding pulleys 32 and their associated bracket 54. The axles for the pulleys 28 are slipped into the frame through slots 55 in the frame flanges 47 for easy insertion and removal should such become desirable. A cut-out portion 57 at the right-hand end of the dial frame and a corresponding aperture 58 at the left-hand end as viewed in Fig. 3 for instance, permits the rollers 28 to be mounted forwardly so that the periphery thereof at the front point in each is substantially flush with the dial plate 23 itself. Bridge-like cavities 59 intermediate the viewing aperture 34 of the dial frame and the notch 51, at one end, and aperture 58 at the other end, permit the ribbon 24 to pass intermediate the frame and dial plate 23 as shown in Fig. 4, so that said ribbon is spaced only a very minute distance from the back of the dial plate 23. This insures the maximum visibility of the line P acting as an indicating pointer on the dial scale.

A one-piece escutcheon plate 61 is provided for the dial and lever apparatus on the cabinet A. This plate is preferably provided in a molded plastic compound with a viewing aperture 62 for the dial 23 and elongated apertures 63 for the finger levers 11, such apertures 63 being long enough to permit a full or intermediate tuning stroke of lever 11, as desired, for rotating a corresponding control cam 12. Station indicia tabs are removably inserted at apertures 64 in the escutcheon plate as shown in Fig. 1. These tabs are illuminated from light rays passing through a transparent portion at the lower edge of the dial 23. The transparent portion is defined by a line 59 (Fig. 1) separation between such transparent portion and the substantially opaque dial background above said line. To prevent any of the light rays from the pilot light 46 from straying through the elongated slot 63 and thus providing an undesirable appearance at the front of the receiver cabinet, a flexible member is provided in a single piece 66 in felt, rubber, or a similar material laying against the rear of the frame portion for the escutcheon plate 61 at the portion having slots 63 therein. A line slit 67 extending longitudinally of each slot in the member 66 permits the movement of the lever 11 therein but the flexible material acts to close the slot to each side of such lever during and after movement thereof as can readily be understood from a consideration of Fig. 1. The member 66 is molded directly into the molded escutcheon plate 61 as shown in

section in Fig. 7 so that no further fastening means are required. This reduces the cost of the escutcheon plate structure and simplifies the assembly thereof. To further eliminate undesirable stray rays of light from the pilot lamp 46, an opaque paper shield 68 is suitably notched and pressed over the ears 48 of the end plates 14 and 16 prior to the assembly of the dial frame 43 thereon. The paper shield may be scored along the lines 69 (Fig. 2) so that when the dial frame 43 is assembled, the flanges 47 will press the upper and lower edges of the paper shield rearwardly to more thoroughly seal the complete frame structure to the rear of the pilot lamp 46 from the inside of the control apparatus.

Modified indicating structure is shown in Figs. 8 to 10, comprising a dial frame 143 with a viewing aperture 144 extending longitudinally and centrally in the front portion thereof. Integral rearwardly extending flanges 147 (Fig. 9) are notched for mounting on end plates 14 and 16 precisely as shown in Figs. 1 to 5, inclusive. Scale indication is accomplished by means of a pointer P' supported on a carriage 71, comprising a one-piece stamped out member adapted to be folded over the upper and lower edges of the lower frame portion 72 of the dial frame 143 (Figs. 9 and 10), with guide flanges 73 and 74 bearing against the rear surface of such portion 72. The carriage 71 is loose enough on the frame to permit sliding movement of such carriage thereon. Movement of the carriage is accomplished by means of a cord 129 passing around a drive pulley 131 on the shaft 113 and continuing over small pulleys 132 and 132'. The ends of the cord 129 may be secured in the pulley 131 in the same manner as the cord 29 is secured to the pulley 31 in Fig. 2, viz., secured to the end of a coiled spring which in turn is mounted on the body portion of the pulley. This assembly maintains the cord taut. The cord 129 is secured to the carriage 71 by means of staggered prongs on a projection 138 similar to the projection 38 of Fig. 6. The three prongs or claws 139, 141 and 142 clamp onto "spaghetti" around the cord in the manner previously described with respect to Fig. 6. As the shaft 113 is rotated to rotate the pulley 131, the pointer P' moves longitudinally to the rear of a dial plate on the front of the frame 143.

A further modification of the ribbon indicator is illustrated in Figs. 11 and 12. In this embodiment a channeled dial frame 243 is mounted vertically on the main control frame, including end plates 14 and 16, and is directly secured to longitudinal frame bars 17 with a notched and peened fastening as described in connection with the embodiment of Fig. 1. A dial 223 is secured to the front of the dial frame 243 by means of rivets or the like 49 so that the indicating scale lies in front of a vertical aperture 244. In this embodiment of the invention the dial frame is mounted intermediate the two end plates 14 and 16 to lie centrally of the control levers and corresponding cams as 11 and 12. Movement of the ribbon 224 to the rear of the dial is accomplished by means of a cup-shaped drum 76 rigidly secured to the tuning shaft 213. A lateral integral flange 77 on the drum carries the ribbon 224 on the outer surface thereof and the ends of the ribbon are retained at the drum under spring tension by means of the coil spring 78 secured at one end 79 to a lug on the drum and at the other end 81 passing through eyeleted clips 82 on the ends of the ribbon. The ends of the ribbon are brought into the inside of the cup-shaped drum through an elon-

gated aperture 83 formed by stamping out and bending back ears 84 on each side of the aperture to provide a rounded metal surface at such aperture and prevent cutting of the ribbon. Contrasting colors over portions 226 and 227 of the ribbon provide a definite line P'' at the junction of such colored portions as shown in Fig. 11. This, of course, is the same as the indicating structure of Fig. 1. A pilot lamp 246 is mounted on a bar 17 by means of a spring clip, and the light therefrom may be shielded at the escutcheon plate for the control levers and dial in the same manner as described with respect to the structure of Fig. 1.

Rotation of the shaft 213, of course, rotates the drum 76, to in turn carry the ribbon over pulleys 86 and 87 appropriately mounted for rotation in the frame 243. The ribbon for indicating purposes may be provided in a large number of different materials, as previously described.

A simplification of the frame structure for the control and indicating apparatus is illustrated in Figs. 13 to 15. End plates 114 and 116 are stamped directly from the top T of the chassis 110. The chassis may be originally blanked out with notches 118 for receiving one or more horizontal bars 117 (Fig. 14) for mounting and supporting purposes while corresponding recesses 91 in each end plate are adapted to receive a rotary tuning shaft 313 therein. For purposes of illustration supporting ears 148 are provided at the front edges of the end plates to support a horizontal dial frame as shown in Figs. 1, 8 and 17. In the event that difficulty is encountered in mounting the chassis in the receiver cabinet by virtue of the front edge of the end plates 114 and 116 lying flush with the front wall of the chassis and the ears 148 extending forwardly of the same, such edge and ears may be placed rearwardly in originally blanking out the chassis as may be readily understood. To provide suitable clearance for the control levers 11, the front vertical wall of the chassis 110 is cut out at 92 and because of the large opening 93 in the top of the chassis 110, the entire lever and cam control apparatus can be dropped down in the chassis from the position shown in the frame structure of Fig. 1. Reinforcements are bumped out of the end plate and chassis top at various points as 94 at the juncture of the end plates and chassis top to cooperate with the bars 117 and bushing structure for the shaft 313 to maintain such end plates at right angles to the chassis top. Any one of the three previously described dial frames and associated indicating apparatus and escutcheon plate may be assembled in combination with the structure of Figs. 13 to 15.

A modification of the horizontal dial frame of Fig. 1 is illustrated in Figs. 17 to 21. To simplify the reading of the drawings with the specification with respect to this modification, those elements which are identical with the corresponding elements of Fig. 1 are indicated by the same reference characters. Those elements of the modified structure which are very similar to corresponding elements in Fig. 1 indicated by reference characters of 50 and below are indicated in Figs. 17 to 21 by reference characters having the prefix 3. Reference characters beginning with 351 designate the modified structure.

A blank for the one-piece dial frame 351 is illustrated in Fig. 21 and comprises a body portion 352 cooperating in the mounting of the frame and acting as a reflector for a dial lamp 46 as is apparent from a consideration of Figs. 18 and

19 particularly. The body portion also cooperates to seal off the lamp from the remainder of the receiver in the manner of the shield 68 of Fig. 2. The frame is mounted upon end plates 14 and 16 by means of flanges 353 and 354 integral with the portion 352. In the original blanking of the frame, tongues 356 and 357 are provided in such a manner that when the frame is formed to its final configuration, the flange 353 extends forwardly from the body portion 352 and the tongues 356 and 357 substantially about the front edge of the end plates 16 and 14, respectively. Apertures 358 in the tongues snap over corresponding studs 49 on the ears 48 of the end plates and similar apertures 359 in the forwardly extending flange 354 snap over studs 49 of the lower corresponding ears 48 on the end plates. The dial frame is provided in sheet metal having sufficient body and resiliency to snap onto the studs in a manner such that peening of the studs 49 is not entirely necessary. Vertical slots 361 adjacent the apertures 358 and 359 fit over the body portion of the ears 48 to prevent lateral movement of the frame and end plates with respect to one another.

A dial 323, desirably provided of composition material, is secured to vertical flanges 362 integral with the mounting flanges 353 and 354 by means of rivets or the like 340, and maintained against warping by staggered retaining tabs 345 and 345' as shown in Fig. 18. The band indicator 24, with a reference line P provided by contrasting colors on the band, is visible through a slot or transparent portion 325 in the dial. The dial is illuminated by means of the pilot lamp 46 dropped from the top flange 353 and a transparent portion of the dial at the lower edge thereof permits light to shine therethrough to illuminate station indicating tabs 64 as shown in Fig. 1. The line 350 defined by the junction of an opaque portion and transparent portion on the front of the dial illustrates the two portions in Fig. 17.

The indicating band or ribbon 24 is carried on pulleys 28 which in turn are supported on pins journaled in the flanges 353 and 354. To permit a rapid assembly of the pins for such pulleys in the frame, apertures 363 are provided in the flange 354 and slots 364 in the flange 353 receive the pins in the manner shown in Figs. 18 and 19. The indicating band 24 is maintained under tension in the manner shown in Fig. 6 and is moved to the rear of the dial 323 by means of clamps as shown in Figs. 3 and 6 between the band 24 and the cord 29 extending over pulleys 31, 32 and 32'. Pulley 31 is keyed or secured to the shaft 13 in the manner heretofore described, while pulleys 32 are rotatably mounted on bracket portions 366 integral with the body portion 352 of the frame. They are angularly formed to the desired position as shown in Fig. 19. Pulleys 32' at the left-hand side of the dial frame are rotatably mounted on an extension 367 integral with the portion 352 of the frame by means of stub shafts or the like in apertures 368 in such extension.

The band 24 passes very closely to the back of the dial 323 by virtue of the fact that notches 365 are provided at each end of the dial, as shown in Fig. 17, permitting the rollers 28 to be mounted in a position such that the periphery thereof is substantially tangential to the front surface of such dial plate.

As may be readily seen from a consideration of Figs. 17 to 21, this one-piece dial frame is provided in a very inexpensive sheet metal member which is extremely rugged and of such construction

tion and configuration that it may be quickly mounted upon the end plates 14 and 16, or, of course, 114 and 116, to not only support the dial and indicating apparatus, but also assist in forming a very rigid and sturdy frame for the control apparatus for the radio receiver. As was shown in Fig. 4, the variable condenser 15 may be mounted directly upon the rigid end plate 16 to be rotated by a one-piece shaft for the tuner and condenser or be rotated by two coupled shafts as has been described in the copending Plensler application referred to above.

It is also apparent from the foregoing description that no independent securing means are necessary to assemble the complete control apparatus including the control elements and the frame except bushings or the like, and couplings on the rotary shaft, and screws or bolts for securing the tuning condenser to the main frame. Portions of the frame elements are upset or peened to irremovably retain one with respect to another, and the dial frame may be similarly secured to the main frame, or merely snapped thereon and frictionally retained in place by the spring pressure in the body of the dial frame. This structure of course facilitates the assembly of the elements as a preassembled unit for mounting on the receiver chassis, or the assembly on the end plates of the main frame integral with the receiver chassis itself.

Although my invention has been described in its preferred embodiments, it is understood that it is not limited thereby but is limited only by the scope of the appended claims.

I claim:

1. A radio receiver system including in combination, single supporting frame means for tuning and indicating apparatus for said radio receiver, said frame means comprising a pair of vertical end frame portions, a rotary shaft for said tuning apparatus journaled in said end frame portions, a plurality of longitudinal cross-bars irremovably secured to said end frame portions and extending therebetween, integral ears extending forwardly from each of said end frame portions, and a dial frame snapped onto said integral ears to be supported thereon and maintained rigidly with respect thereto for carrying a dial thereon.

2. A radio receiver system including in combination, single supporting frame means for tuning and indicating apparatus for said radio receiver, said frame means comprising a pair of vertical end frame portions, a rotary shaft for said tuning apparatus journaled in said end frame portions, and a horizontally extending dial panel supported at the front edge of said end frame portions having a substantially closed back at said front edges, a flange extending forwardly from said back at the top and at the bottom thereof for supporting thereon a dial and indicating apparatus therefor.

3. A radio receiver including in combination, single supporting frame means for tuning and indicating apparatus for said radio receiver, said frame means comprising a pair of vertical end frame portions, a rotary shaft for said tuning apparatus journaled in said end frame portions, a pair of longitudinal bars extending between said end frame portions at the front thereof and irremovably secured thereto to rigidly support and space apart said frame portions, and a dial frame extending vertically comprising a pair of supporting flanges rigidly secured to said pair of longitudinal bars intermediate said end frame por-

tions, with said dial frame adapted to support a dial thereon at an elongated aperture therein intermediate said flanges.

4. A radio receiver including in combination, frame means for tuning means for said receiver, and a dial panel supported on said frame means, said panel comprising a substantially imperforate combination body portion and light shield positioned at the front edge of the frame, a forwardly extending flange at the top of said panel having a pair of integral tongues therein for mounting engagement with said frame, and a forwardly extending flange at the bottom of said panel, with said panel adapted to carry a dial secured at the front of said flanges.

5. Supporting means for tuning control and indicating apparatus for a radio receiver, such means including in combination a metal chassis for supporting radio receiver elements thereon having a top and supporting sides, a pair of end plates extending vertically from said chassis with at least one of said end plates being integral with the top of said chassis, longitudinally extending means between said end plates and rigidly secured thereto for spacing and supporting such plates, a dial panel supported by said end plates at the front edge portion thereof having a light reflecting back and indicating means carried on said panel in front of said reflecting back.

6. Supporting frame means for tuning control and indicating apparatus for a radio receiver, such means including a pair of vertical end frame portions, spacing and supporting means intermediate said end frame portions and rigidly secured thereto, and a stationary dial panel supported at the front of said end frame portions having a pair of supporting flanges, with said supporting flanges extending forwardly, having an opening intermediate the same and having supporting portions adapted for carrying a dial plate at said opening.

7. A radio receiver, including in combination frame means for supporting thereon tuning control and indicating apparatus for said radio receiver, said frame means including a pair of end frame portions, a plurality of horizontal supporting and spacing bars extending between said end frame portions in rigid connection therewith, each of said end frame portions having a pair of supporting ears extending forwardly therefrom, and a stamped-out dial frame with laterally extending flanges, said flanges having integral portions for locking engagement with said end frame portion at said ears for supporting said dial panel on both of said end frame portions in a position to carry indicating apparatus thereon for operative connection with the tuning control apparatus on said frame.

8. A radio receiver, including in combination frame means for supporting thereon tuning control and indicating apparatus for said radio receiver, said frame means including a pair of end frame portions for supporting radio control apparatus therebetween, a dial panel mounted on said end frame portions at the front thereof and said panel including a substantially imperforate light reflecting portion at the back thereof adjacent said end frame portions, and laterally extending flanges at the top and bottom of said panel for supporting a dial on the front thereof.

9. A radio receiver including frame means for supporting thereon tuning control and indicating apparatus for said radio receiver, said frame means including a pair of end frame portions, and a stamped-out dial panel rigidly mounted at the

front of said end frame portions, with said dial panel having an integral lateral flange at the top and at the bottom thereof and having an opening at the front thereof for carrying a dial at said opening, and light reflecting means at the back of said dial panel to project light forwardly onto the dial at the front of the panel.

10 A preassembled frame for carrying control and indicating apparatus for a radio receiver, said preassembled frame adapted to be mounted

upon a radio receiver, said frame including a pair of vertical end plates, means for rigidly supporting said end plates and spacing them apart, and a horizontal dial panel mounted on said end plates at the front of said frame, said dial frame including a pair of laterally extending flanges and an integral light reflecting plate intermediate said flanges positioned at the front edges of said end frame plates.

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