Oct. 26, 1948. F. H. OWENS 2,452,067

APPARATUS FOR RADIO TUNING, VOLUME CONTROL, WAVE BAND SELECTION, AND OTHER PURPOSES

Filed July 11, 1945 5 Sheets-Sheet 1

Fig. 1a.

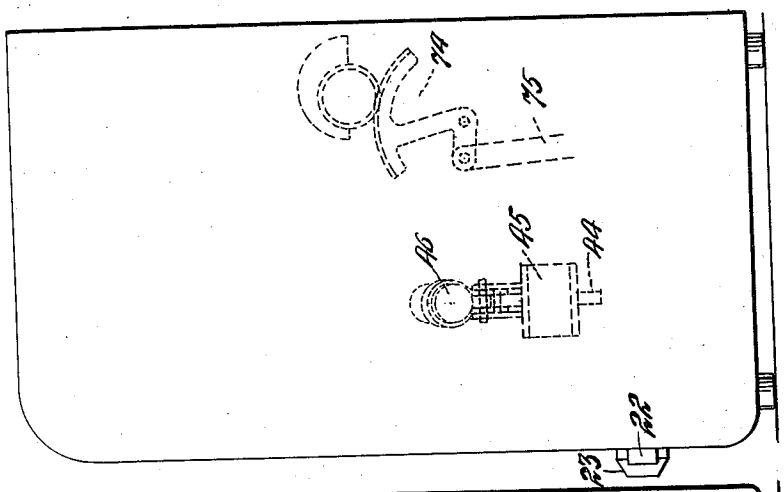
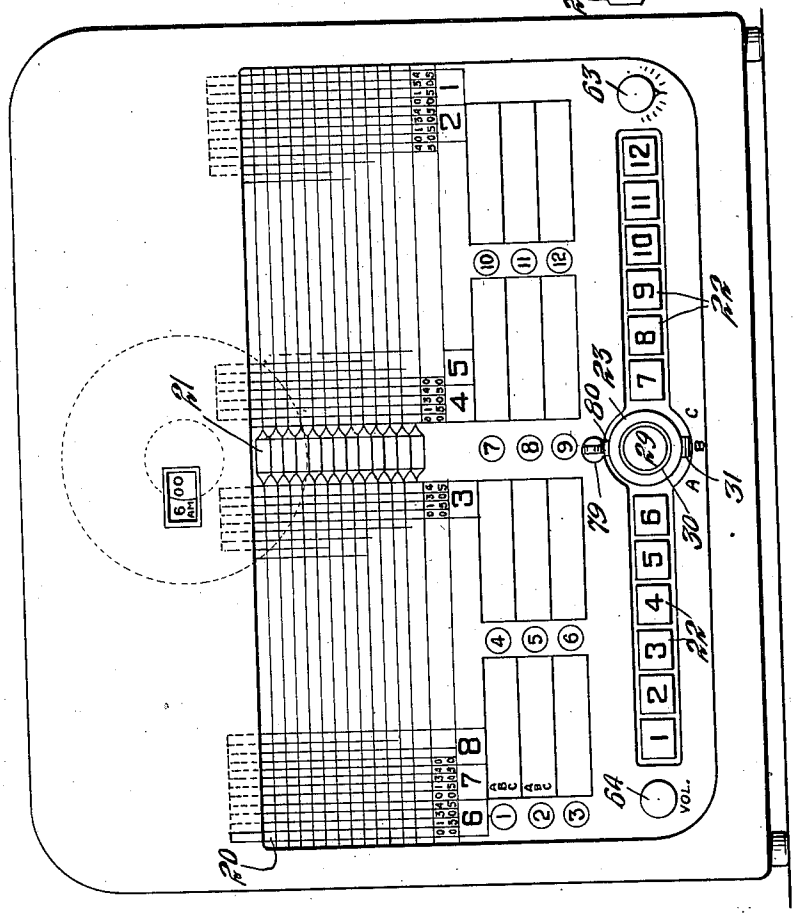


Fig. 1.



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APPARATUS FOR RADIO TUNING, VOLUME CONTROL, WAVE BAND SELECTION, AND OTHER PURPOSES

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Fig. 2.

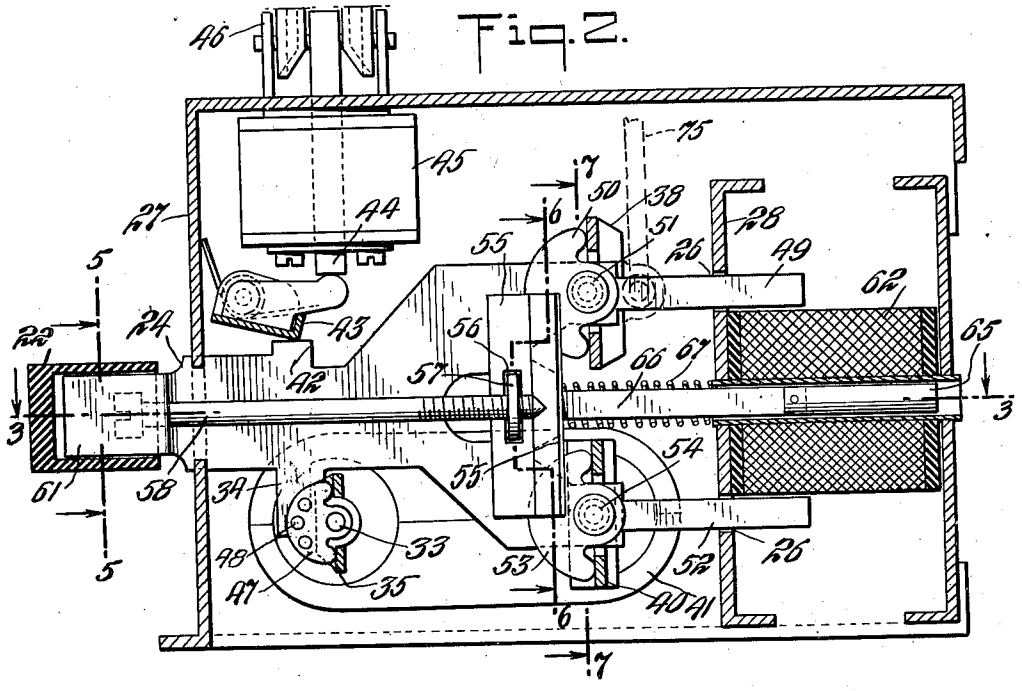
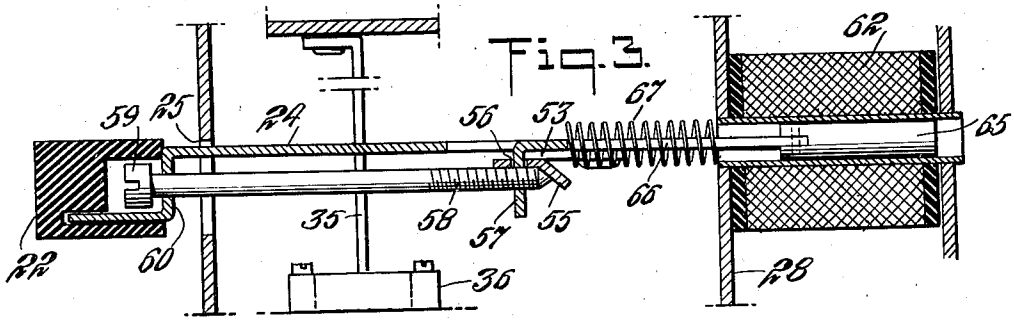


Fig. 3.



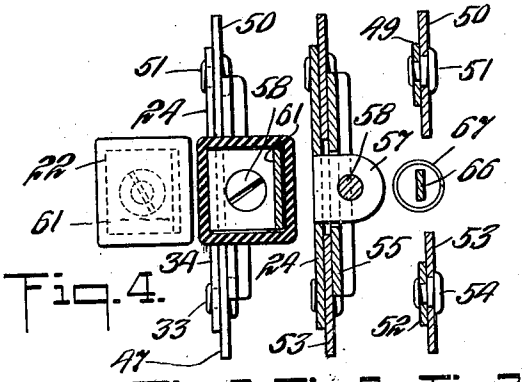


Fig. 4.

Fig. 5. Fig. 6. Fig. 7.

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Fig. 8.

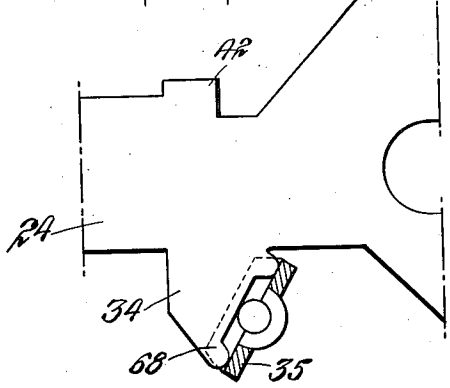


Fig. 9.

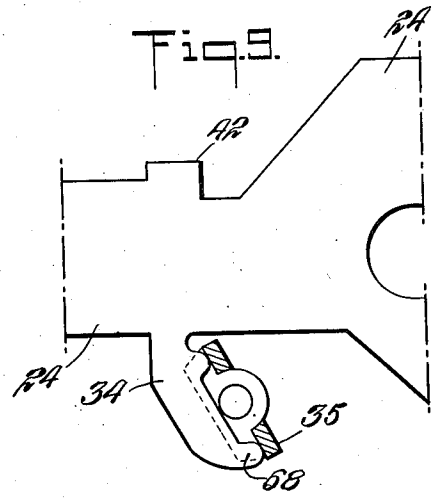


Fig. 13.

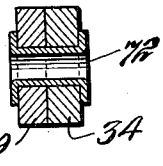


Fig. 11.

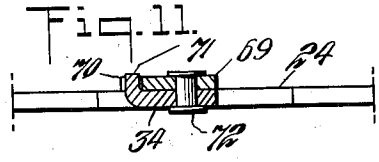


Fig. 12.

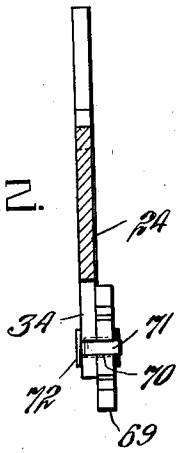
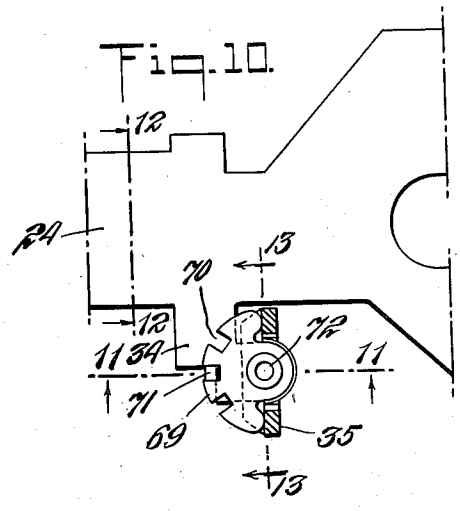


Fig. 10.



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APPARATUS FOR RADIO TUNING, VOLUME CONTROL, WAVE BAND SELECTION, AND OTHER PURPOSES

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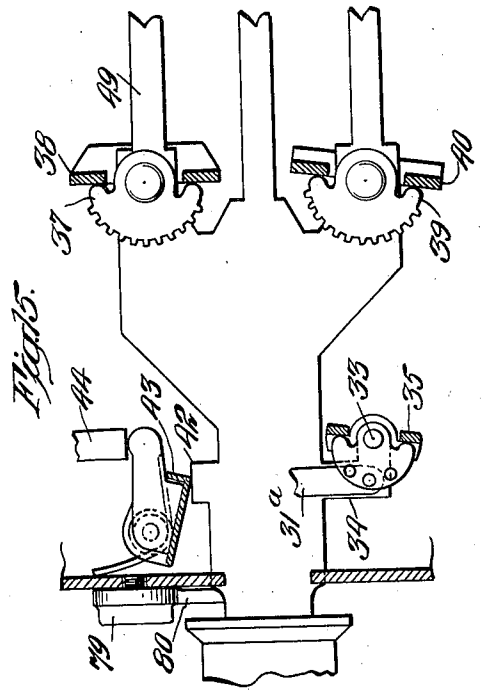


Fig. 15.

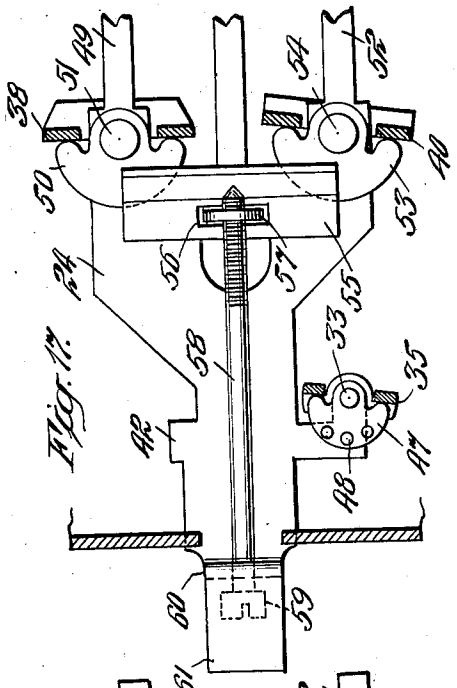


Fig. 17.

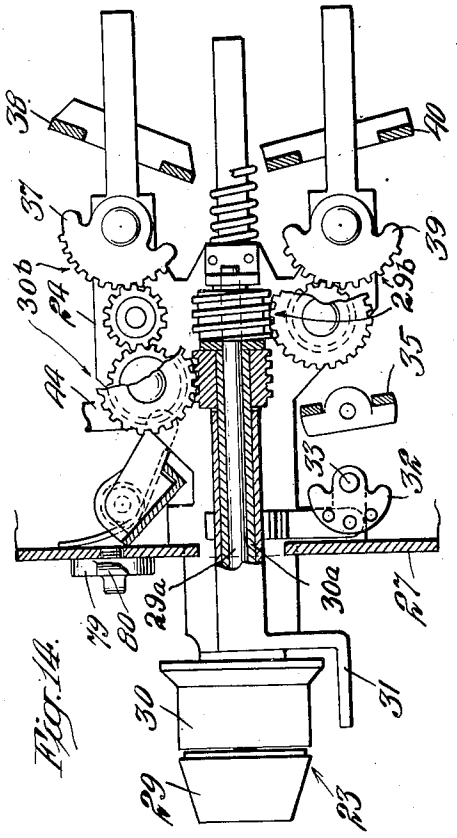


Fig. 14.

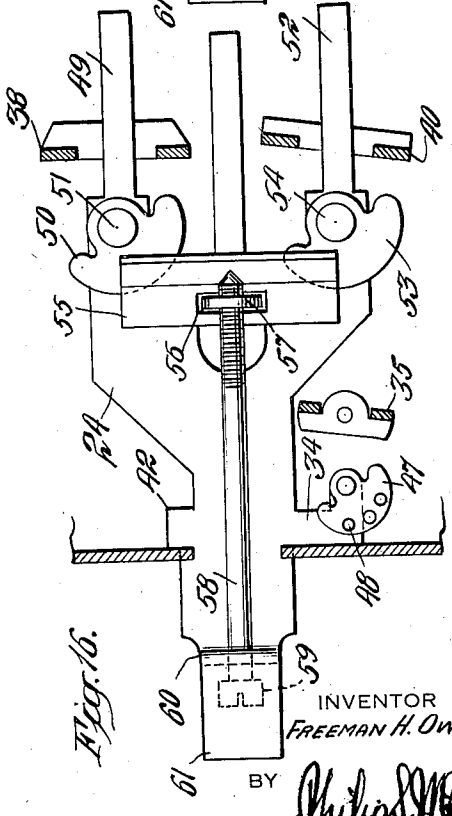


Fig. 16.

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APPARATUS FOR RADIO TUNING, VOLUME CONTROL, WAVE BAND SELECTION, AND OTHER PURPOSES

Filed July 11, 1945 5 Sheets-Sheet 5

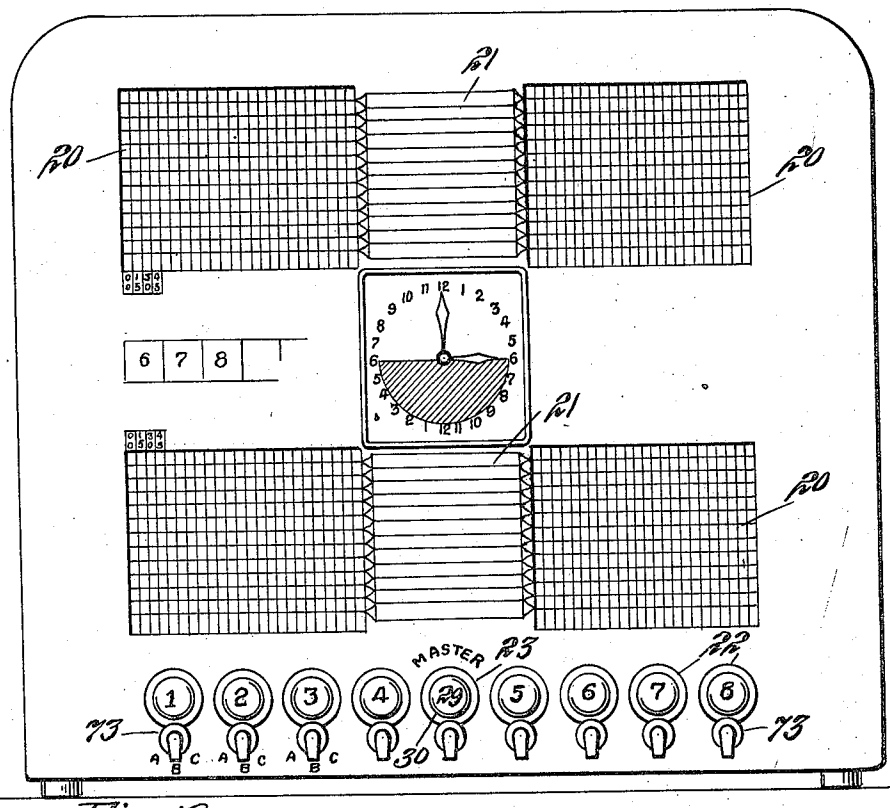


Fig. 18.

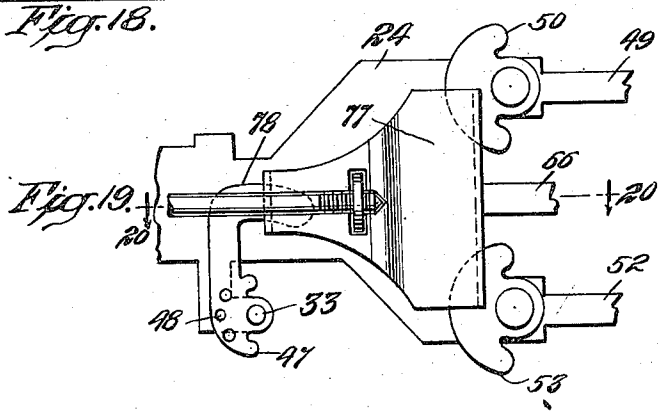


Fig. 19.

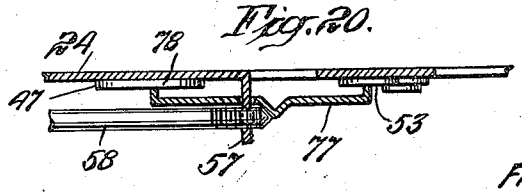


Fig. 20.

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Patented Oct. 26, 1948 2,452,067

UNITED STATES PATENT OFFICE

2,452,067

APPARATUS FOR RADIO TUNING, VOLUME CONTROL, WAVE BAND SELECTION, AND OTHER PURPOSES

Freeman H. Owens, New York, N. Y.

Application July 11, 1945, Serial No. 604,364

24 Claims. (Cl. 74—10)

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The invention here disclosed relates to apparatus for effecting various control purposes.

In particular, the invention relates to the control of radio apparatus, for example, to effect tuning adjustments, volume control, wave band selection, the tuning of a radio set on or off, and the like.

Special objects of the invention are to provide apparatus for such purposes which while thoroughly efficient and practical will be relatively inexpensive, consist of but few parts and take up small space.

In line with these objects it is a purpose of the invention to provide automatic control apparatus which at small additional cost can be combined with ordinary radio receiving sets, thus to convert a radio receiver of acceptable or approved design from ordinary manual control operation to one either fully or partly automatic in character.

Other objects of the invention are to make it a simple and easily understandable operation for the average individual to initially adjust or set the mechanism, for instance, to effect reception of certain radio stations, in selected wave bands, at desired sound levels, and the like.

Other objects are to provide apparatus of the character indicated which can be readily manufactured and assembled and which will be rugged in character and not liable to get out of order even under rough handling.

Other objects of the invention are to provide apparatus of the character indicated which can be readily adapted to accomplishing various control purposes and easily changed to meet different requirements of design or operating conditions, such as might be encountered in adapting the invention to different kinds or types of radio receivers.

Other desirable objects and the novel features of invention by which all objects are attained are set forth or will appear in the course of the following specification.

The drawings accompanying and forming part of the specification illustrate a present practical embodiment of the invention. Structure, however, may be modified and changed as regards the immediate disclosure, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Fig. 1 in the drawings is a front elevation of a radio receiving set having features of the invention incorporated therein; Fig. 1*a* is an end view of the same;

Fig. 2 is an enlarged vertical sectional view as on substantially the plane of line 2—2 of Fig. 1,

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showing one of the station selecting slides in the position it occupies after having been actuated to accomplish the turning on of a radio receiver, the selection of a particular wave band, the tuning of a station in the selected wave band and the setting of the volume control for that particular station;

Fig. 3 is a broken horizontal sectional view as on substantially the plane of line 3—3 of Fig. 2;

Fig. 4 is an end view of the slide, and Figs. 5, 6 and 7 are cross sectional details as on lines 5—5, 6—6 and 7—7 of Fig. 2;

Figs. 8 and 9 are broken part sectional details of slides having relatively fixed wave band selecting cams;

Fig. 10 is a similar view of similar structure with a wave band selecting cam which can be adjusted and secured in adjusted relation;

Figs. 11, 12 and 13 are cross sectional details on substantially the planes of lines 11—11, 12—12 and 13—13 of Fig. 10;

Figs. 14 and 15 are diagrammatic views illustrating operation of the so-called master slide for setting up the rockers controlling the wave band selecting, tuning and volume control functions;

Figs. 16 and 17 are similar views showing the action of one of the so-called secondary slides in picking up and assuming the settings established by the master slide;

Fig. 18 is a front elevation of a receiver incorporating another embodiment of the invention;

Fig. 19 is a broken side elevation of a modified form of secondary slide; and Fig. 20 is a sectional view on line 20—20 of Fig. 19.

In Figs. 1 and 18 the invention is shown embodied in radio receivers of the program preselecting type disclosed in Patent No. 2,403,454, dated July 9, 1946, in which station selecting time keys 20 can be shifted to different station selecting or "off" positions on the scales indicated at 21.

The receiver illustrated in Fig. 1 is designed for accomplishing automatic reception of any 12 different stations in any 3 different wave bands. Accordingly, it is provided with 12 different control units numbered 1 to 12, appearing as a row of push buttons 22 across the bottom of the set, and an intermediate so-called master control 23 disposed in the middle of the row.

The control units consist in the main of slides 24, mounted to operate in guide openings 25, 26, in upright supporting plates 27, 28, Figs. 2 and 3.

The master slide may be made up as in copending patent application Serial No. 540,292, filed June 14, 1944, carrying a knob 29 for volume

control, back of that a knob 30 for tuning, and in back of the latter a 3-position lever 31 for wave band selection.

These special features being fully disclosed in the application last referred to, are shown here only in their general relation, in Figs. 14 and 15, it being sufficient for the present disclosure to understand that the wave band selecting lever 31, by means of a link 31*a*, effects the setting of a cam 32 pivotally mounted at 33 on a dependent extension 34 of the slide for tilting a rocker 35 connected with a wave band selecting switch 36; that the knob 30 on sleeve 30*a*, through gearing at 30*b* effects the adjustment of a cam 37 pivotally mounted on the upper portion of the slide for accomplishing adjustments of the rocker 38 which is connected with the tuning mechanism; that the front knob 29 on shaft 29*a*, through gearing at 29*b* adjusts the cam 39 pivotally mounted on the lower portion of the slide for effecting adjustments of the rocker 40 connected with the volume control 41; and that the fixed cam 42 on the upper edge of the slide lifts a rocker 43 to raise the core 44 of an "off" solenoid 45, said core being connected to rock the radio set controlling switch 46 into the "on" position.

The secondary slides, while possibly of the same basic structure, that is, made up of the same slide formations, under the present invention may carry just the actuating cams and rely on the master slide or other control means for effecting the necessary setting of those cams.

Thus the secondary slide illustrated in Figs. 2 to 7, is shown as having a wave band selecting cam 47 pivoted at 33 on the dependent portion 34 of the slide and arranged to be normally retained in any one of the three different wave band selecting positions by a spring detent at 48. On the upper arm 49 of the slide a tuning cam 50 is pivotally mounted at 51 and on the lower arm 52 there is shown a volume control cam 53 pivotally supported at 54.

For securing the tuning and volume control cams 50 and 53 in the positions to which they may be set, there is provided in the illustration a single clamp plate 55 slotted at 56 to loosely hang over the lug 57, said plate extending vertically in overlapping engagement over both the cams and being held so by the point of a screw 58 threaded in the supporting lug 57 and having a head 59 accessible at the outer end of the slide for securing or releasing the clamp plate. To guide and support the outer end of this relatively long screw stud, the outer end of the slide is shown as being laterally offset to form an outer bearing 60 for the screw. To protect and conceal the screw head, a cover may be engaged over the outer offset portion 61 of the slide, and this cover may, in fact, be a push button element such as heretofore referred to and designated 22, Fig. 1.

The secondary slides made up as described, free of cam adjusting devices, need occupy but small space laterally and so can be placed quite closely together, as indicated in Fig. 1 and in Figs. 4, 5, 6 and 7.

The setting of the cams on the secondary slides may be accomplished, after loosening the screws 58, by adjusting and holding the wave band selecting, tuning and volume control rockers 35, 38 and 40, and then forcing the cams on the secondary slide up against the rockers so adjusted.

The master slide with its adjusting devices provides a convenient and practical means for accomplishing the adjustment of the cams on the secondary slides.

Thus, as indicated in Fig. 14, the wave band selecting lever 31 of the master slide may be turned to any one of its three positions to select the A, B or C wave channel. Then as this slide is pushed inward the cam 42 will operate rocker 43 to turn on the set, if it were off at that time, and the wave band selecting rocker 35 will be turned to pick the selected wave band. While being held in this relation, either by hand or by other means such as by solenoid 62 or by a temporary holding device, the knob 30 may be turned to rock the cam 37 to tilt rocker 38 to effect tuning of the set to the desired station. Adjustment of knob 29, by rocking cam 39 and tilting the rocker 40 will serve to adjust the volume control 41 to the desired sound level for that station, all as indicated in Fig. 15.

The secondary slide chosen for the station so tuned and volume controlled, with the clamp screw 58 loosened as in Fig. 16, may then be pushed in to bring its three cams into engagement with the three adjusted rockers. These cams 47, 50 and 53, will then be forced to assume the position of those rockers, as in Fig. 17, the operation being completed by tightening screw 58 to secure the secondary cams in the positions they have been forced to assume by the rockers.

While the master slide provides a handy, practical and convenient means for accomplishing the setting of the actuating elements of the secondary slides, it is contemplated as part of the invention that the rockers may be set by other means. Thus, as indicated in Fig. 1, a knob 63 may be provided for arbitrarily tuning the set, it being understood that in so tuning the tuning rocker 38 will be set in a predetermined position as a function of that tuning. Similarly, the volume may be adjusted by means of a separate volume control 64 which, by varying the position of rocker 40, will provide a means for enabling a desired setting of the volume control cam 53.

The spring detent or other holding means 48 for the wave band selecting cam 47 on the secondary slide, while sufficiently positive in effect to accomplish the setting of the wave band rocker 35 when the secondary slide is pushed in, is yieldable to the operation of the master slide because, as disclosed in copending patent application Serial No. 540,292, the wave band selecting lever 31 locks in non-rotatable fashion into a guide notch in the front panel 27 when the master slide is shifted inwardly to make the adjustments described.

In the automatic operation of the set illustrated, the slides, and this may include the master as well as the secondary slides, are actuated by the solenoids 62, previously mentioned, having magnetic cores 65 connected with one or more of the arms or branches 49, 52 or 66 of the slides. To get the parts together within a desired close spacing, these solenoids may be staggered, that is, some of them connected with the upper and others with the intermediate or lower branches of the slides.

Springs 67 about the intermediate branches 66 forward of the supporting partition 28, project the slides into position for automatic or hand actuation.

Where it is intended that a slide always be used for one certain wave band adjustment, the wave band setting cam on that slide may be fixed, instead of adjustable, as heretofore considered.

Thus, as shown in Figs. 8 and 9, one secondary slide 24 may have the dependent extension 34 shaped to form a rigid wave band rocker ac-

tuating cam 68, and these fixed cams on different ones of the slides may be inclined in opposite directions or vertical, such as, for example, to set the rocker 35 for reception in the three wave band positions A, B and C.

As an alternate the slides may be all alike but carry cams which can be positively secured in any one of the three positions mentioned.

Thus in Figs. 10 to 13 the slide is shown as having a wave band rocker actuating cam 69 with three notches 70 to be engaged, any one of them, over a lug 71 turned at an angle from the extension portion 34, the cam after being so located being riveted in that particular angular relation by a tubular eyelet 72.

For some purposes it may be desirable to locate the clock and timing mechanism more nearly at the center of the receiver than shown in Fig. 1.

This may be accomplished as illustrated in Fig. 18, where the clock is shown disposed substantially at the center of the front panel and with the station selecting timing keys, which may be either of the slide type disclosed in Patent No. 2,403,454, or of the push-button type disclosed in Patent No. 2,385,840, arranged in four banks of keys, two above and at opposite sides of the clock position and the other two below and at opposite sides of the clock.

This view also shows how the wave band selection may be accomplished by wave band selecting switches 73 disposed below and in line with the tuning units, as in Patent No. 2,403,454.

In both embodiments of the invention illustrated a single master slide provides means for effecting tuning and volume control adjustments.

In the first illustrated form, Fig. 1, the wave band selecting lever 31 enables the master slide to be used for the further function of effecting wave band selection.

Thus a single master slide may be used for tuning, volume control and, as pointed out, in some instances for wave band selection as well.

The various individual station selecting slides or so-called secondary slides, may then be set from the rockers adjusted and held by the master slide. This simplifies and reduces the number of parts, since only the master slide need carry the means for adjusting the rockers and the other, secondary slides only need to have means for securing the rocker actuating cams thereon in position after they have been set from the rockers held by the master slide.

The holding means for the cams on the secondary slides, the clamp plate 55 in Figs. 2 and 3, has a self-adjusting mounting so that under the wedging action of the securing screw 58 it can engage with equal pressure both upper and lower cams 50 and 53. The loose mounting of this clamp plate at an intermediate point, on the lug 57, and the engagement of the plate at its intermediate point by the screw allows for any free pivoting movement necessary for the plate to rock one way or another to fully and firmly engage both cams.

The invention, through the provision of the master tuning unit 23, Fig. 1, provides for the tuning of a radio receiving set at any time, to any station, in any selected wave band and to any desired sound level. This single master control provides, as well, a means by which any number of secondary control units 22 may be set to bring in at any time, either by hand or by automatic timed operation, a desired station in a selected wave band and at a desired sound level.

Thus a radio receiver may be set up for different stations in different wave bands such as broadcast, short wave, frequency modulation, television or the like. If left to automatic operation the selected variety of stations will be automatically brought in at the different selected times, but operation of any one of such units at any time will bring in the station, at the desired sound level, of that particular slide.

The invention may be used with any approved form of tuning mechanism, that indicated at 74, actuated through connections 75 from rocker 38, being merely illustrative.

The blanks for the different slides may be alike so as to permit making up either master or secondary slides from one main set of blanks. Except possibly that the secondary slides may be mounted closer together, the master and secondary slides may be substituted at different positions in the chassis of a ratio receiving set. The secondary slides, carrying fewer parts, are lighter and therefore may be operated with less power than required by the master slides. Thus, if necessary to use two solenoids for operating a master slide, it may be found that a single solenoid will be sufficient to operate a secondary slide.

Most of many of the parts of the units described may be metal or other sheet material stampings and which are relatively inexpensive. The assembling of the parts is simple and the complete apparatus can be made up at low cost.

Fig. 19 shows how structure may be further simplified by using a single clamp plate for all three of the cams on a secondary slide. This single clamp plate, as indicated at 77, is substantially triangular in shape so as to engage at the three corner portions the tuning cam 50, the volume control cam 53 and the extension 78 of the wave band selecting cam 47. The screw 58 has a wedging engagement with the central portion of the clamp plate so as to apply holding pressure substantially equally on all three of the cams.

As shown in Figs. 1, 10 and 15, a special "hold-in" button may be provided as indicated at 79, having a dependent cam portion 80 engageable over the outer end edge portion of the master slide to secure it in the inward position.

By pushing in the slide and then turning the button or lever 79, the slide may be secured and held in its innermost position. This frees both hands for effecting desired adjustments of the tuning and volume control cams. When such adjustments have been made the button will be thrown to the side to release the slide, it being arranged to normally stand in this released position.

While of particular importance as a radio program timing and preselecting mechanism, as here shown, it will be appreciated that the invention has many other possible uses for timing and control purposes.

The cams or strikers, which when free and the rockers are held, can adjust themselves to the settings of the rockers and when secured, with the rockers free, can be used to return the rockers to those particular settings, may be made up in various shapes and forms to meet special requirements, and this is true also as to the rockers or tilt bars.

The terms employed herein are therefore to be considered in a descriptive rather than in a limiting sense, except possibly as restrictions may be imposed by the state of the prior art.

What is claimed is:

1. Apparatus for effecting tuning and volume

control adjustments of a radio receiver, comprising a plurality of movable station selecting members, a rocker in the path of movement of one portion of said members for effecting tuning adjustments, a rocker in the path of movement of another portion of said members for effecting volume control adjustments, cams adjustably mounted on the respective portions mentioned of said members for effecting variable adjustments of said tuning and volume controlling rockers, separate, hand operable elements on one of said members for independently setting the tuning adjusting and the volume control adjusting cams on said member, and means on another of said members for securing the cams thereon in positions to which they may be set by engagement with the rockers, said means being releasable to free said cams for setting by said rockers and adjustable to secure the cams in the positions to which they have been set.

2. Apparatus for effecting tuning and volume control adjustments of a radio receiver comprising a plurality of movable station selecting members, a rocker in the path of movement of one portion of said members for effecting tuning adjustments, a rocker in the path of movement of another portion of said members for effecting volume control adjustments, cams adjustably mounted on the respective portions mentioned of said members for effecting variable adjustments of said tuning and volume controlling rockers, separate, hand operable elements on one of said members for independently setting the tuning adjusting and the volume control adjusting cams on said member, a clamp plate loosely fulcrumed on another of said members in engagement with both the tuning and the volume control cams thereon, and a single means acting on said clamp plate to fix the same in holding engagement with both said cams, the cams when released from the holding engagement of said clamp plate being free to adjust themselves by engagement with the tuning and volume control rockers.

3. Apparatus for effecting tuning and volume control adjustments of a radio receiver comprising a plurality of movable station selecting members, a rocker in the path of movement of one portion of said members for effecting tuning adjustments, a rocker in the path of movement of another portion of said members for effecting volume control adjustments, cams adjustably mounted on the respective portions mentioned of said members for effecting variable adjustments of said tuning and volume controlling rockers, separate, hand operable elements on one of said members for independently setting the tuning adjusting and the volume control adjusting cams on said member, and means on another of said members for securing the cams thereon in positions to which they may be set by engagement with the rockers, said means being releasable to free said cams for setting by said rockers and adjustable to secure the cams in the positions to which they have been set, said members being in the form of slides mounted for independent actuation.

4. Apparatus for wave band selection, tuning and volume control adjustments of a radio receiver comprising independently operable slides, wave band selecting, tuning and volume control cams adjustably mounted on one of said slides, means on said slide for effecting the setting of the wave band selecting, tuning and volume control adjusting cams on said slide, wave band selecting, tuning and volume control adjusting rockers engageable and operable by the respective cams on said slide, wave band selecting, tuning and volume control cams adjustably mounted on another of the slides and free to be shifted to corresponding positions upon engagement with the respective rockers which have been set by the cams of the first mentioned slide and means for effecting the securing of said cams in their adjusted relations on said other slide.

5. Apparatus for wave band selection, tuning and volume control adjustments of a radio receiver comprising independently operable slides, wave band selecting, tuning and volume control cams adjustably mounted on one of said slides, means on said slide for effecting the setting of the wave band selecting, tuning and volume control adjusting cams on said slide, wave band selecting, tuning and volume control adjusting rockers engageable and operable by the respective cams on said slide, wave band selecting, tuning and volume control cams adjustably mounted on another of the slides and free to be shifted to corresponding positions upon engagement with the respective rockers which have been set by the cams of the first mentioned slide and means for effecting the securing of said cams in their adjusted relations on said other slide, including a single clamp plate pivotally supported intermediate its ends and engaging two of said cams at its opposite ends, and a single clamp screw engaging the intermediate portion of said clamp plate for adjustably setting it into holding engagement with the respective cams.

6. Apparatus for effecting tuning and volume control adjustments of a radio receiver, comprising a slide, tuning and volume control cams adjustably mounted on said slide, a single clamp plate for simultaneously securing or releasing both said cams, tuning and volume control setting rockers engageable by said cams and means for effecting adjustments of said rockers and for enabling said rockers to effect setting of said cams when said latter are freed by said clamp plate.

7. Apparatus for effecting control of various instrumentalities, comprising companion slides each having independently adjusted cams, rockers engageable and operable by said different cams, means on one slide for setting the cams thereon in different positions, and means on the other slide for fixedly securing the cams thereon but releasable to free said cams for setting of the same by engagement with the rockers aforesaid.

8. Apparatus for effecting control of various instrumentalities, comprising companion slides each having independently adjusted cams, rockers engageable and operable by said different cams, means on one slide for setting the cams thereon in different positions, and means on the other slide for fixedly securing the cams thereon but releasable to free said cams for setting of the same by engagement with the rockers aforesaid, said means including a clamp plate pivotally supported on the slide intermediate its ends and engaging the cams thereon at its opposite ends and a screw engaging the intermediate portion of said clamp plate for wedging the same into holding engagement with both cams.

9. Apparatus for effecting wave band selection and volume control of a radio receiver and comprising independently operable slides, a rocker for effecting wave band selection, a rocker for effecting volume control adjustments, cams on the slides engageable with the respective rockers for effecting wave band and volume control

adjustments, means on one slide for setting the cams thereon in various positions of wave band selection and volume control, and means on another of said slides for securing the cams thereon in adjusted relation and releasable to free the cams thereon for setting by engagement with said rockers.

10. Apparatus for effecting wave band selection and volume control of a radio receiver and comprising independently operable slides, a rocker for effecting wave band selection, a rocker for effecting volume control adjustments, cams on the slides engageable with the respective rockers for effecting wave band and volume control adjustments, means on one slide for setting the cams thereon in various positions of wave band selection and volume control, means on another of said slides for securing the cams thereon in adjusted relation and releasable to free the cams thereon for setting by engagement with said rockers and means for holding the rockers while obtaining the setting of the cams therefrom.

11. In control apparatus, rockers for effecting various control adjustments, a slide movable toward and away from said rockers, means for adjusting said rockers and for holding the same temporarily in positions of adjustment, cams on the slide for actuating said rockers, a clamp on the slide for securing said cams in positions of adjustment and arranged to free said cams for adjustment by said rockers when the latter are held in fixed positions of adjustment.

12. Apparatus for wave band selection, tuning and volume control adjustments of a radio receiver comprising independently operable slides, wave band selecting, tuning and volume control cams adjustably mounted on one of said slides, means on said slide for effecting the setting of the wave band selecting, tuning and volume control adjusting cams on said slide, wave band selecting, tuning and volume control adjusting rockers engageable and operable by the respective cams on said slide, wave band selecting, tuning and volume control cams adjustably mounted on another of the slides and free to be shifted to corresponding positions upon engagement with the respective rockers which have been set by the cams of the first mentioned slide and means for effecting the securing of said free cams in their adjusted relations on said other slide, including a single clamp adjustably engageable with all three of said wave band selecting, tuning and volume control cams.

13. Apparatus for wave band selection, tuning and volume control adjustments of a radio receiver comprising independently operable slides, wave band selecting, tuning and volume control cams adjustably mounted on one of said slides, means on said slide for effecting the setting of the wave band selecting, tuning and volume control adjusting cams on said slide, wave band selecting, tuning and volume control adjusting rockers engageable and operable by the respective cams on said slide, wave band selecting, tuning and volume control cams adjustably mounted on another of the slides and free to be shifted to corresponding positions upon engagement with the respective rockers which have been set by the cams of the first mentioned slide and means for effecting the securing of said cams in their adjusted relations on said other slide, including a generally triangular shaped clamp plate and pressure applying means adjustably engageable with the central portion of said triangular plate, said wave band selecting, tuning and volume control cams being disposed in triangular relation for holding engagement by said substantially triangular clamp plate.

14. Apparatus for wave band selection, tuning and volume control adjustments of a radio receiver, comprising a movable slide, wave band selecting, tuning and volume control cams pivotally mounted in generally triangular relation on said slide, a substantially triangular clamp plate adjustably engaging all three of said cams, and wave band selecting, tuning and volume control adjusting rockers mounted in position for engagement and actuation by said adjustably secured cams.

15. Apparatus for wave band selection, tuning and volume control adjustments of a radio receiver, comprising movable station selecting members, wave band selecting, tuning and volume control cams angularly adjustable on each of said members and disposed in substantially triangular relation to each other, a single, substantially triangular clamp in adjustable holding engagement with all three of said cams on each of said members, and wave band selecting, tuning and volume control adjusting rockers positioned for engagement and operation by the respective cams on said members.

16. Control apparatus of the character disclosed comprising an operating slide, an actuating cam adjustably mounted on said slide, a control rocker positioned to be engaged by said cam, means on the slide for effecting adjustments of said cam, means for temporarily locking the slide in position with said cam engaged with the rocker to thereby hold said rocker in the position to which it has been adjusted by said cam, a secondary slide, an actuating cam loosely mounted on said secondary slide in position to be engaged with and adjusted by said held rocker when said secondary slide is pushed in when the operating slide is locked in and means on said secondary slide for securing the cam thereon in the position to which it has been adjusted by said held rocker and whereby said secondary slide will thereafter be capable of positioning said control rocker the same as said operating slide.

17. Apparatus for control purposes comprising rockers adjustable to effect different controls, means for setting said rockers to different control positions and for temporarily holding them in those positions, member separately operable for effecting actuation of said rockers, independently adjustable cams on each of said operating members located respectively to engage individual rockers, means on said members for securing the cams thereon in their independently adjusted relations and arranged when released to enable said cams upon engagement with temporarily held rockers to adjust themselves to the settings of the rockers so held and whereby upon securing said cams after attaining said settings, said members may be actuated to adjust said rockers to the positions in which they were temporarily held.

18. Apparatus for control purposes comprising actuated members adjustable to effect different controls, means for adjusting and holding said actuated members in different positions of adjustment, actuating members separately operable each to effect actuation of said actuated members, striker elements on each of said actuating members for operating engagement with the respective actuated members and arranged to be freed to enable them, by engagement with the actuated members, when so held, to adjust themselves to the particular settings of the held actuated members, and means for securing said striker elements on the actuating members in the posi-

tions to which they have been so adjusted and whereby they will then be effective to restore the actuated members to the same positions in which they were so temporarily held.

19. Apparatus for control purposes comprising actuated members adjustable to effect different controls, means for adjusting and holding said actuated members in different positions of adjustment, actuating members separately operable each to effect actuation of said actuated members, striker elements on each of said actuating members for operating engagement with the respective actuated members and arranged to be freed to enable them, by engagement with the actuated members, when so held, to adjust themselves to the particular settings of the held actuated members, and common means on each actuating member for securing all of said striker elements thereon in their positions of adjustment.

20. Apparatus for control purposes comprising rockers adjustable to effect different controls, means for setting and holding said rockers in positions of desired adjustment, slides operable toward said rockers, cams freely pivoted on said slides in position to engage and accept the settings of the rockers so held, and means on each slide for securing said free cams in the positions to which they have been so adjusted.

21. Apparatus for control purposes comprising operating slides, cams adjustably secured on said slides, control effecting rockers positioned to be engaged and adjusted by said cams, fixed cams on the slides, a control switch, a rocker for shifting said switch in one direction and positioned to be actuated by any one of said fixed cams on the slides, and means independent of said slides for actuating said switch in the opposite direction.

22. Control apparatus comprising a set of individually operative function selecting slides, means for effecting selective individual actuation of said slides, rockers operative for different control purposes, differently positioned cams on said slides engageable with said rockers to adjust the same to different positions, a switch connected to control the functions of said slides, a magnet arranged to throw said switch to "off" position, a rocker arranged to throw said switch "on" and cams on said slides positioned to actuate said last mentioned rocker and whereby actuation of any one of said slides will result in the switch controlling functions of the slides being thrown "on," in the event said switch has been left in the "off" position by previous operation of said "off" switch throwing magnet.

23. Apparatus for control purposes comprising a plurality of different station selecting slides, said slides having exposed push-button means at the ends of the same and whereby said slides may be individually operated by hand, a plurality of cams adjustably mounted on each of said slides, means for securing said variably adjustable cams in different set positions on the respective slides, control effecting rockers positioned for actuation by the different cams on any one of said slides, springs for projecting the individual slides and slide retracting solenoids having cores connected with the individual slides.

24. Apparatus for control purposes comprising a plurality of different station selecting slides, said slides having exposed push-button means at the ends of the same and whereby said slides may be individually operated by hand, a plurality of cams adjustably mounted on each of said slides, means for securing said variably adjustable cams in different set positions on the respective slides, control effecting rockers positioned for actuation by the different cams on any one of said slides, springs for projecting the individual slides, slide retracting solenoids having cores connected with the individual slides and a manually operable hold-in device for releasably securing one of said slides in retracted relation independently of the holding action of the solenoid acting on that slide.

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