

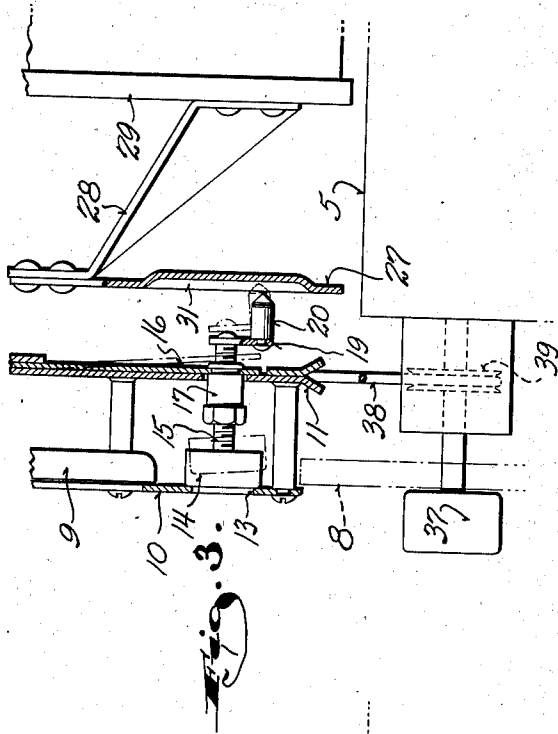
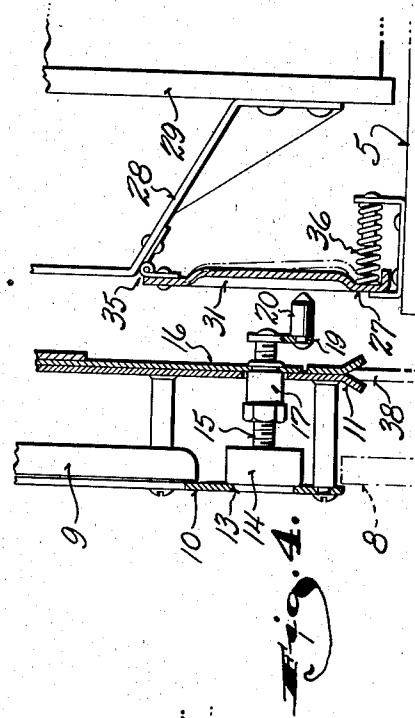
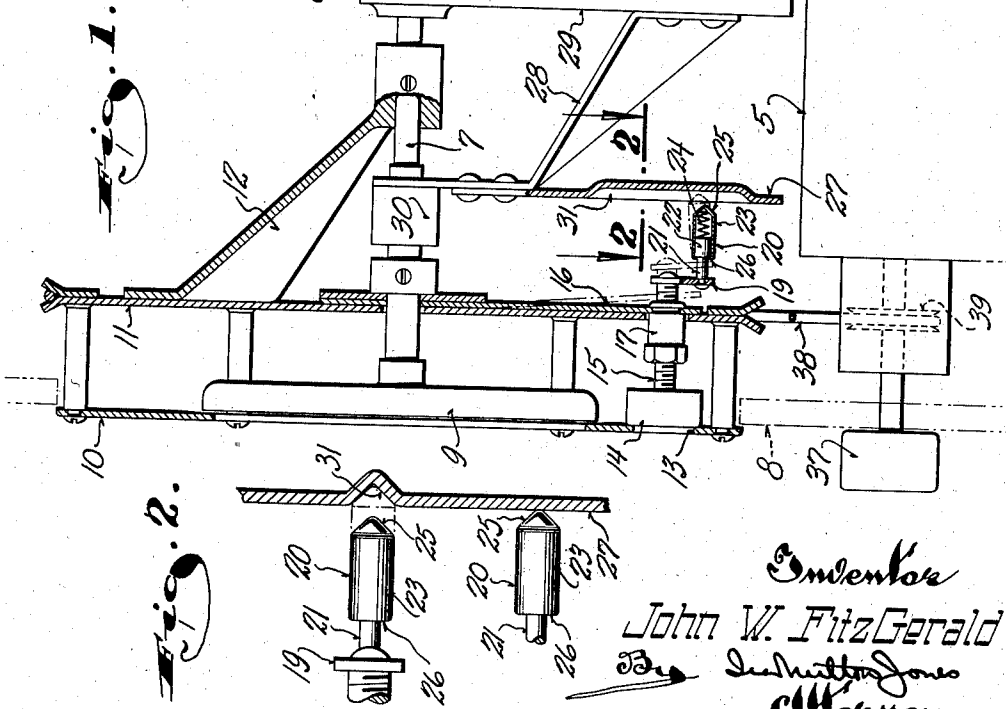
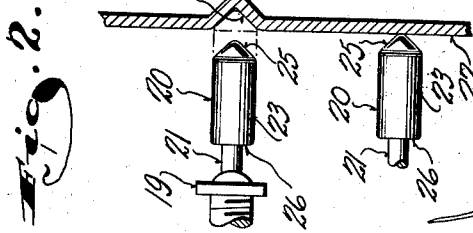
June 11, 1940.

J. W. FITZ GERALD

2,203,723

TUNING DIAL

Filed Feb. 16, 1938



Inventor
John W. FitzGerald
By Ingham Jones
Attorney

UNITED STATES PATENT OFFICE

2,203,723

TUNING DIAL

John W. Fitz Gerald, Milwaukee, Wis., assignor
to Briggs & Stratton Corporation, Milwaukee,
Wis., a corporation of Delaware

Application February 16, 1938, Serial No. 190,798

7 Claims. (Cl. 74—10)

This invention relates to improvements in tuning dials for radio receivers and refers particularly to so-called "automatic" dials whereby a receiver may be quickly tuned to any one of a number of predetermined broadcasting stations.

Radio tuning instrumentalities of this character are divided broadly in two classifications, namely, the so-called manually actuated type, and the motor driven type. It is to the former that this invention appertains.

These tuning devices generally comprise a rotatable dial directly connected with the condenser shaft and equipped with a plurality of depressible station selecting elements in the form of buttons or the like adapted to be pushed to an operative position so that upon rotation of the dial with a button pushed in, tuning motion of the condenser is arrested at the proper position to tune in the station represented by the selected button.

Inasmuch as the dial must move in both directions of rotation, the stops carried thereby which are rendered operative by the depression of their respective buttons or station selecting devices, approach their cooperating stationary stop from either direction. This means that the thickness of the dial carried stops must be compensated for to insure having the dial stop at exactly the same point regardless of the direction from which the dial carried stop approaches its cooperating stationary stop.

It is therefore an object of this invention to provide an improved construction for the cooperating stops whereby accuracy in the location of the point at which the dial is stopped is assured regardless of the direction from which the dial carried stop approaches the stationary stop.

More specifically it is an object of this invention to provide cooperating stops, so designed that accuracy is attained without entailing movement of the stationary stop, thus permitting the same to be rigidly secured in a fixed position.

With the above and other objects in view which will appear as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described, and more particularly defined by the appended claims, it being understood that such changes in the precise embodiment of the hereindisclosed invention may be made as come within the scope of the claims.

The accompanying drawing illustrates several complete examples of the physical embodiment of the invention constructed in accordance with

the best modes so far devised for the practical application of the principles thereof, and in which:

Figure 1 is a vertical sectional view through a tuning dial constructed in accordance with this invention;

Figure 2 is a sectional view on an enlarged scale taken through Figure 1 on the plane of the line 2—2 and showing particularly the relationship of the dial carried and stationary stops;

Figures 3 and 4 are views similar to Figure 1 showing slightly modified embodiments of this invention.

Referring now particularly to the accompanying drawing in which like numerals indicate like parts throughout the several views, the numeral 5 designates the chassis of a radio receiver equipped with the usual tuning condensers indicated generally by the numeral 6. The movable plates of the condenser are rotated through one hundred eighty degrees (180°) as is customary by means of a condenser shaft 7 which projects forwardly toward the panel 8 of the cabinet in which the receiver is mounted.

The extreme front end of the condenser shaft is connected with the customary dial assembly 9, the internal structure of which is not shown and which merely visually indicates the position of adjustment of the condenser by suitable indicia and a moving pointer.

Surrounding the dial assembly 9 is an escutcheon ring 10 fixed to a large pulley 11 in back of the panel and which in turn is secured to the condenser shaft by an arm 12. Hence rotation imparted to the escutcheon ring 10 is transmitted directly to the condenser shaft.

Extending about the lower half of the escutcheon ring is a plurality of circumferentially spaced finger holes 13 behind which depressible station selecting devices or buttons are mounted, each adapted to be depressed to an operative position whereupon rotation of the escutcheon ring is arrested at the proper point to tune the receiver to the station which the selected button represents. As is customary, the front faces of these buttons (not shown) may be equipped with suitable indicia to designate different stations, such as the call letters thereof.

The buttons 14 and the manner of mounting them is identical, hence a description of one will suffice.

The button proper is carried by the front end of a threaded stud 15 which is adjustably secured to a spring blade 16, which may form

part of a substantially semicircular plate overlying the back of the large pulley 11. To fasten the stud 15 to the spring blade, an internally threaded bushing 17 is fixed to the blade and the stud 15 is threaded therein so that by turning the same, its position with respect to the spring blade may be adjusted. A lock nut secures the stud in any adjusted position.

On its extreme inner end the stud carries a radial arm 19 to the outer end of which a stop 20 is fastened. In the embodiment of the invention illustrated in Figures 1 and 2 this stop 20 comprises a pin 21 rigidly secured to the arm 19 and having an enlarged head 22 on which a hollow sleeve 23 is slidably mounted. The sleeve 23 is yieldingly urged outwardly on the pin by a spring 24 confined between the end of the pin and the closed outer end 25 of the sleeve which is pointed as shown. The spring propelled motion of the sleeve is limited by an inturned flange 26 on the opposite end of the sleeve engaging the shoulder formed by the back of the head 22.

In the normal position of the parts illustrated in full lines in Figure 1 the pointed end of the stop 20 is spaced slightly from the front face of a substantially semicircular stationary plate 27 held rigidly in position by being fixed to a bracket 28 which extends from the front frame 29 of the condensers and mounts a bearing 30 on its outer end in which the extended end of the condenser shaft is journaled.

The plate 27 has a V-shaped groove 31 formed in its front face and lying on a vertical plane passing through the axis of the condenser shaft. The groove 31 is so dimensioned as to snugly receive the pointed end of the stop 20 and thus constitutes a stationary stop with which the stop 20 is engageable upon depression of its button 14 and rotation of the escutcheon ring to bring the stop 20 into alignment with the groove 21.

Inasmuch as the pointed end of the stop 20 fits the groove 31 snugly and without play in either direction, it will be readily apparent that the direction from which the stop 20 approaches the stationary stop provided by the groove 21 is of no consequence. In every instance rotation will be stopped at exactly the same point to tune the receiver to the station represented by the selected button.

By adjusting the stud 15 and consequently the movable stop 20 carried thereby rotationally about the axis of the stud, the relative positions of the movable and stationary stops are adjustable so as to enable the button to be employed for any one of a number of broadcasting stations lying in adjacent channels.

It is also to be appreciated that the provision of the spring 24 compensates for variations in the degree of pressure applied to the button 14 and insures the movable stop snapping into the groove 31 as the escutcheon ring is turned. However, if desired, this spring 24 may be eliminated and the dial carried stop mounted rigidly on the arm 19 as shown in Figure 3. With this construction the manual pressure applied to the button must be depended upon for snapping the stop 20 into the groove 31 as the dial is rotated.

The advantages of an additional spring to insure engagement of the cooperating stops upon being brought into alignment may also be secured by having the stop plate 27 which carries the groove 31 hinged as at 35 and yieldingly pressed forwardly to its normal position by a spring 36, as shown in Figure 4.

In all instances the receiver may be manually

tuned in the customary manner by a knob 37 mounted in front of the panel and drivingly connected by a cable 38 trained about the periphery of the large pulley 11 and a small pulley 39 driven directly by the knob 37.

From the foregoing description taken in connection with the accompanying drawing, it will be readily apparent to those skilled in the art, that this invention provides an exceedingly simple manner of insuring accuracy in the location at which the rotatable element of an automatic tuning dial is arrested regardless of the direction in which the dial element is rotated.

What I claim as my invention is:

1. In a radio tuning device: a member movable to effect tuning of a receiver with which the device is associated; a series of substantially circumferentially arranged manually depressible stops carried by said member; a single stationary stop in back of said member adapted to be engaged by any one of the depressible stops to arrest motion of the movable member at a predetermined point, said stationary stop having a flat surface coextensive with the range of movement of said movable member and having a sharply defined depression into which any depressible stop pushed into its operative position snaps as the movable member is actuated.

2. In a radio tuning device: a member movable to effect tuning of a receiver with which the device is associated; a series of depressible stops carried by said member, each of said stops having an outer yieldable end portion movable away from said movable member; and a member fixed in back of said movable member adjacent to the end portions of the stops and having a flat surface with which said yieldable end portions of the stops are engageable upon depression thereof, said fixed member having a groove into which the yieldable end portions of said stops engage upon alignment of said stops with the groove to arrest tuning motion of said movable member.

3. In a radio tuning device; a member movable to effect tuning of the radio receiver; cooperating stationary and movable stops at one side of the movable tuning member, the movable stops being adjacent to and movable with said tuning member and selectively movable toward the stationary stop for engagement with the same to arrest tuning motion of the movable member at a predetermined point; one of said cooperating stops being in the form of a groove extending transversely to the other of said stops, and said other stop having a pointed end engageable in the groove to arrest motion of the movable tuning member at the same definite point regardless of the direction from which the movable stop approaches the stationary stop; means for bringing said stops into cooperative relationship; and spring means operable upon alignment of said stops for effecting the engagement of the same with a spring pressure and independently of the function of said last named means.

4. In a radio tuning device: a member movable to effect tuning of a receiver with which the device is associated; a series of depressible stops carried by said movable tuning member, each adapted to represent a predetermined broadcasting station; a part mounted in the back of the movable tuning member and having a flat surface coextensive with the range of movement of the movable tuning member and over which a depressible stop pushed into its operative position may slide as the movable tuning member is moved, and said part having a depression in its

flat surface into which any such selected depressible stop engages to arrest tuning motion of the movable tuning member at a predetermined point.

- 5 5. In a radio tuning device: a member movable to effect tuning of a receiver with which the device is associated; a series of depressible stops carried by said movable tuning member, each adapted to represent a predetermined broadcast-
 10 ing station; a part mounted in back of the movable member and having a flat surface over which a depressible stop pushed into its operative position may slide as said movable tuning member is moved, and said part having a depression in its flat surface into which any such selected
 15 depressible stop engages to arrest tuning motion of the movable tuning member; and a spring active in a direction perpendicular to the movable tuning member upon engagement of the selected
 20 depressible stop with said surface and operable to snap the selected depressible stop into the depression upon movement of the movable tuning member to carry the stop into alignment there-
 25 with.
6. In a radio tuning device: a member movable to effect tuning of a receiver with which the device is associated; a series depressible stops carried by said movable tuning member, each adapted to represent a predetermined broadcast-
 30 ing station and movable upon depression in a direction away from said movable tuning member; a part mounted in back of the movable tuning member and having a substantially large flat surface over which a depressible stop pushed into

its operative position may slide as said movable tuning member is moved, and said part having a depression in its flat surface into which any such selected depressible stop engages to arrest tuning motion of the movable member; and a spring
 5 yieldingly urging said part bodily toward the movable tuning member to yield and maintain the connection between a depressed stop and said surface under spring tension to insure the de-
 10 pressed stop snapping into the depression upon movement of the movable tuning member to carry the stop into alignment with the depression.

7. In a radio tuning device: a member movable to effect tuning of a receiver with which the device is associated; a member rigidly mounted
 15 in back of said movable tuning member and having a flat surface parallel to the path of motion of said movable tuning member, said rigidly mounted member having a narrow groove opening to its flat surface transverse to the path of
 20 motion of said movable tuning member; and a series of depressible stops carried by said movable tuning member each having an end portion yieldably engageable with the flat surface of said rigidly mounted member upon depression of the
 25 stops and arranged to traverse said groove as the movable tuning member is actuated, each of said stops being independently depressible to carry its said end portion into engagement with the flat surface of the rigidly mounted member for en-
 30 gagement in said groove to arrest tuning motion of said movable member.

JOHN W. FITZ GERALD.