March 3, 1942. F. L. CREAGER 2,275,286

INDEXING MECHANISM

Filed Nov. 30, 1940

Fig. 1.

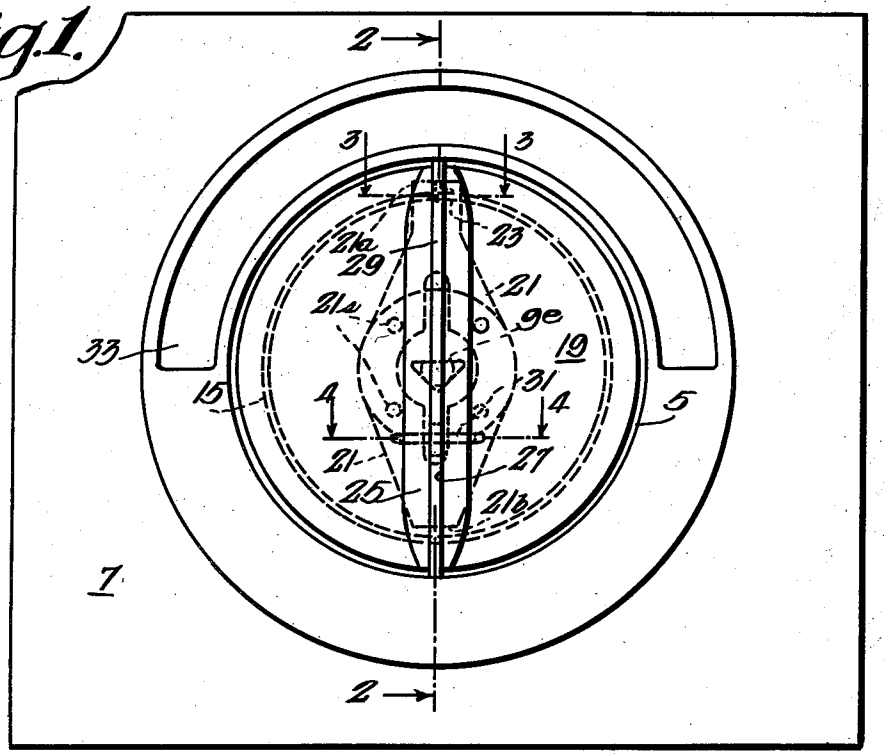


Fig. 2.

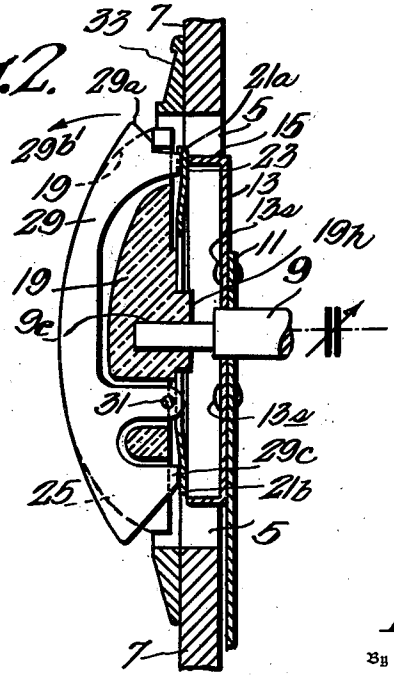


Fig. 3.

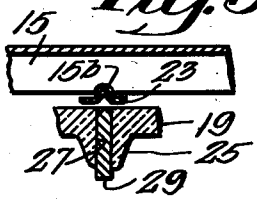
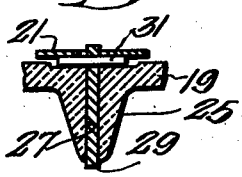


Fig. 4.



Inventor

Frederick L. Creager

By J. Duff

Attorney

Patented Mar. 3, 1942 2,275,286

UNITED STATES PATENT OFFICE

2,275,286

INDEXING MECHANISM

Frederick L. Creager, Camden, N. J., assignor to Radio Corporation of America, a corporation of Delaware

Application November 30, 1940, Serial No. 367,880

6 Claims. (Cl. 74—10)

The invention relates to indexing mechanisms for achieving the rapid and accurate setting of a dial, such, for example, as the tuning dial of a radio set. Considered from one aspect the invention herein disclosed constitutes an improvement upon the invention more broadly claimed in the copending application of Wendell L. Carlson, Serial No. 352,509, filed August 14, 1940.

The prior art discloses several indexing mechanisms comprising a pawl and a main or auxiliary dial plate provided with detents or notches which are individual to the more frequently dial settings, and which are selectively engaged by the pawl when the desired setting is achieved. Thus, if the pawl is attached to a knob it may be moved rapidly over the dial plate to the approximate setting desired whereupon the pawl engages the detent individual to that setting and the operator is advised by his sense of touch that an exact setting has been achieved.

The principal objection to the indexing mechanisms of the early prior art is that they either required at least partial disassembly of the radio or other apparatus during the setting-up process, or were otherwise so complicated in their adjustment as to inhibit their use by an unskilled operator. As to the above, see, by way of example, "Wireless World" (British) February 9, 1927, page 162; see also U. S. Patent 1,964,449.

The foregoing and other objects to the indexing mechanisms of the early prior art substantially obviated in accordance with the above identified Carlson disclosure by the use of a dial plate constituted of a relatively soft metal, such, for example, as copper, brass, or the like, and by making the detents or notches individual to the several settings therein as by a punch, thrust, or other force applied to the said soft metal plate, either (*a*) by means of a separate tool inserted through a hole provided for that purpose in the dial knob or (*b*) by means of a wedge-shape detent-forming element carried behind the control panel on the free end of a flat spring which, when pressed downwardly, as by means of a cam controlled by a separate knob on the front panel, and suddenly released, imparts the requisite force to the wedge-shape element.

One objection to the first (*a*) of the above described arrangements is that the intensity of the force applied to the indexing plate is left to the judgment and skill of the person making the "set-up"; further, the separate punch or other tool may become lost or mislaid. The second (*b*, above) arrangement has proven, in some instances, to be unsatisfactory since the very presence of an auxiliary knob on the control panel appears to prompt even those familiar with its purpose to "fiddle" with it so that in some instances detents have been set up on the indexing plate at points where no station in fact exists.

Accordingly, the principal object of the present invention is to provide an improved indexing mechanism which may be set up without the use of separate tools and wherein the setting-up element, though permanently attached and readily accessible, is concealed from the unitiated or casual operator of the radio or other apparatus with which the indexing mechanism is associated.

Other objects and advantages will be apparent and the invention itself will be best understood by reference to the following specification and to the accompanying drawing, wherein

Figure 1 is a front elevational view of a radio tuner incorporating an indexing mechanism constructed in accordance with the principle of the invention, and

Figures 2, 3 and 4 are sectional views taken on the similarly numbered section lines of Fig. 1.

In the drawing, wherein like reference characters designate the same parts in all figures, 5 designates an opening in the control panel 7 of a radio cabinet within which a main tuning shaft 9 is mounted. Shaft 9 extends through a support 11 and through a concentrically mounted circular dish or plate 13 which may be conveniently secured to the support 11 as by studs 13*s*. Plate 13 has an outwardly turned rim 15 constituted of copper, brass or other relatively soft metal which preferably extends into or through the opening 5 in the panel 7 and terminates adjacent the plane of the front surface of said panel.

The main tuning shaft 9 is susceptible of 180° rotation under the control of a knob 19 which may be provided with a hub 19*h* within which the preferably flattened end 9*e* of the tuning shaft 9 is seated. The diameter of the knob 19, the length of the shaft 9, and the depth of the opening in the hub 19*h* in which the shaft end 9*e* is received are preferably such that when the knob is mounted in position, the outer edge of its rear surface will be spaced slightly in front of the outwardly turned soft metal rim 15 on the stationary plate 13.

There is a strip 21 constituted of spring metal affixed adjacent its center to the rear surface of the knob 19 as by screws 21*s* arranged about the hub 19*h*. The free end of the spring metal strip which is designated 21*a* extends into the clearance space between the rear surface of the knob

19 and the edge of the soft metal rim 15, and is provided, within the said space, with a wedge-shape projection 23 which is biased (by its spring support) inwardly against the rim 15 so that, as the knob is rotated, it will ride on the rim and follow any detents which may be provided in the surface thereof. The opposite end 21*b* of the spring metal strip terminates at a point adjacent, but not touching, the inner side surface circumference of the rim 15. Since the strip 21 is constituted of spring metal, it is obvious that any force exerted upon its free end 21*b* and tending to extend it inwardly in the direction of the plate 13 will be opposed by the counter or biasing force of the strip.

The outer surface of the knob 19 is provided with a protuberance 25 which extends across the knob along substantially the same diameter as the spring metal strip 21 on the opposite or inner knob surface. The long sides of this protuberance 25 will ordinarily be grasped by the operator's fingers in manipulating the knob during the tuning operation. There is a central, relatively narrow, slot 27 running the full length of the protuberance 25 and within which a trip blade or lever arm 29 is mounted as on a pivot or fulcrum 31 adjacent the rear surface of the knob in the space between the hub 19*h* and the free end 21*b* of the spring 21. The exposed edge of the lever arm 29 is preferably of a contour similar to that of the protuberance 25 and is preferably flush with the top surface thereof throughout a greater portion of its length, so that, to a caual observer, the said exposed edge of the lever appears to comprise merely a pointer for the scale 33 which surrounds the knob. (The pointer-like appearance of the exposed surface of the lever is enhanced when the said surface comprises a bright metal.) However, that end of the lever arm 29 which lies on the "upper" half of the knob 19 (i. e. opposite the "half" containing the pivot 31) is provided with a "lip" 29*a* which extends beyond the surface of the protuberance 25 and which may be engaged by the operator's finger or fingers to move the lever arm in the direction of the curved arrow 29*b* in Fig. 2.

As the lip 29*a* is pulled outwardly, the lever 29 will pivot on the fulcrum 31 and its opposite end 29*c* will be moved inwardly against the biasing force of the spring-end 21*b*. If the lip 29*a* is then suddenly released, that part of the edge of the lever which lies beneath the lip will be projected against the wedge-shaped element 23 by the force applied to the opposite end 29*c* of the lever by the release of the energy stored in the spring at 21*b*, and a detent 15*b* (Fig. 3) will be formed in the soft metal rim 15 at a point thereon corresponding to the dial or pointer setting at the time the lever is released. Thus to "set-up" a station on the indexing mechanism, it is merely necessary to rotate the knob 19 until the desired station is tuned in, pull out the free-end 29*a* of the lever, and then permit it to fly back.

Since, as previously pointed out, the wedge-shaped element 23 is normally biased (as by the spring 21*a* on which it is mounted) against the rim 15, it serves as a pawl, which, in engaging a detent in the rim during the tuning operation, advises the operator through his sense of touch that a desired station setting has been achieved.

In the embodiment of the invention which has been selected for illustration, a single strip (21) of spring material serves, in the interests of simplicity, both as the biasing means for returning the lever 29 to its idle position and as a mount for the detent-forming wedge-shaped pawl 23. Obviously, however, separate springs may be provided if desired. Other modifications of the invention, such, for example, as the elimination of the protuberance 25 on the knob 19 (in which event the lever arm 29 may be mounted flush with the principal surface of the knob) will suggest themselves to those skilled in the art. It is to be understood, therefore, that the foregoing is to be interpreted as illustrative and not in a limiting sense except as required by the prior art and by the spirit of the appended claims.

What is claimed is:

1. In combination, a rotatable shaft, a stationary index member constituted of an easily deformed material mounted about said shaft, a control member mounted on the end of said shaft in front of said index member, and means mounted on said control member for applying a deforming force to said indexing member.

2. In combination a rotatable shaft, a stationary index member constituted of an easily deformed material mounted about said shaft, a knob mounted on the end of said shaft in front of said index member, and means comprising a spring-actuated lever for applying a deforming force to said index member.

3. The invention as set forth in claim 2 and wherein said lever lies adjacent the face of said knob and comprises a pointer for indicating the setting of said rotatable shaft.

4. In combination, a rotatable shaft, a stationary index plate constituted of an easily deformed material and a scale both concentrically mounted about said shaft, a knob mounted on the end of said shaft in front of said index plate, a pointer mounted on said knob and adapted to be read in connection with said scale, and means comprising said pointer for applying a deforming force to said index plate at a point thereon corresponding to the point indicated on the scale by said pointer.

5. In combination, a rotatable shaft, a stationary index member constituted of an easily deformed material mounted about said shaft, a knob mounted on the end of said shaft in spaced relation with respect to said index member, a wedge-shaped pawl mounted adjacent the inner surface of said knob and biased to bear against said index member, and a lever mounted on said knob for applying a deforming force to said index member through said wedge-shaped pawl.

6. The invention as set forth in claim 5 and wherein a spring mounted on said knob adjacent the fulcrum end of said lever supplies said deforming force.

FREDERICK L. CREAGER.