Nov. 21, 1944. J. NIRDLINGER 2,363,194

ATTACHING CLIP FOR CONTROL KNOBS

Filed Oct. 25, 1943

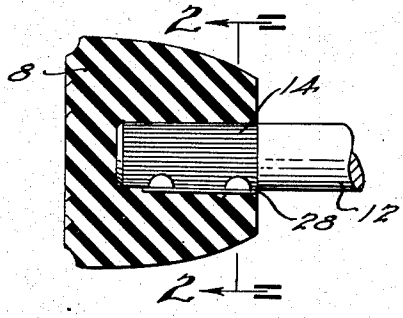


Fig. 1.

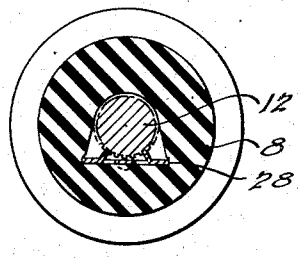


Fig. 2.

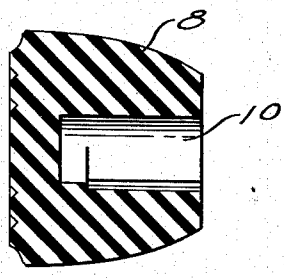


Fig. 3.

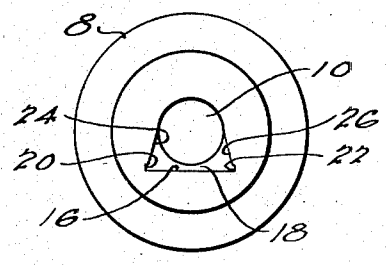


Fig. 4.

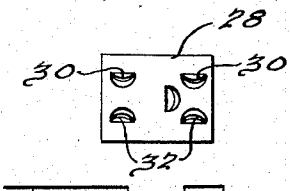


Fig. 5.

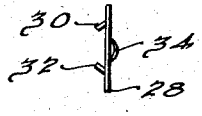


Fig. 6.

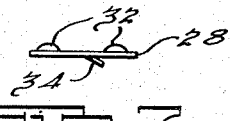


Fig. 7.

INVENTOR
John Nirdlinger.
BY
Harness, Dickey & Pierce
ATTORNEYS.

Patented Nov. 21, 1944

2,363,194

UNITED STATES PATENT OFFICE

2,363,194

ATTACHING CLIP FOR CONTROL KNOBS

John Nirdlinger, Detroit, Mich., assignor to Detrola Corporation, Detroit, Mich., a corporation of Michigan

Application October 25, 1943, Serial No. 507,638

1 Claim. (Cl. 287—53)

This invention relates to means for detachably attaching control handles or knobs to shafts and the like, and is particularly useful in attaching the control knobs to the tuning condenser and volume and switch control shafts of radios.

The main objects of this invention are to provide improved means for detachably attaching a control knob to a shaft so as to be rotatably fixed with respect thereto, but which permits the knob to be readily and easily assembled to or removed from the shaft by movement in an axial direction; to provide improved means of this character which will not loosen up through use as often happens with set screws heretofore commonly used for this purpose; and to provide means of this character which permits the control knobs to be securely assembled on the shafts without the use of a screw driver or other tool.

An illustrative embodiment of this invention is shown in the accompanying drawing in which:

Figure 1 is a view, partly in elevation and partly in section, of a control knob detachably secured to the serrated end of a shaft by means of the improved clip which is the subject matter of this invention;

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1, looking in the direction indicated by the arrows;

Fig. 3 is a longitudinal sectional view of the control knob shown in Fig. 1, illustrating the shape and extent of the shaft and clip-receiving opening therein;

Fig. 4 is a view in elevation of the control knob shown in Fig. 3, taken from the open or right hand end as viewed in that figure;

Fig. 5 is a top plan view of the improved attaching clip;

Fig. 6 is a view in end edge elevation of the same;

Fig. 7 is a view in side edge elevation of the same.

In the manufacture and construction of devices particularly such as radios and the like it has heretofore been customary to attach the control knobs to the variable condenser shafts and to the switch and volume control shafts by providing the knob with a longitudinally extending or axially disposed bore to receive the protruding shaft end and then providing the knob with a radially disposed set screw for frictionally gripping or engaging the shaft.

The use of such construction presents a problem both in the assembly of the radio as well as during the use of the machine. In the assembly it is necessary to insert these relatively small set screws into the threaded openings in the knobs and then, when assembled on their respective shafts, tighten the set screws down onto the shaft by means of a screw driver. Frequently during the use of the radio these control knobs become loose and every operator or owner of a radio set is not equipped with a sufficiently small screw driver for retightening them.

In the present construction both of the foregoing difficulties have been overcome in that the control knob may be applied to its shaft in a fraction of the time required to attach the prior type and at the same time do it without the use of any tools such as a screw driver or the like. Also the control knob, while in position on its shaft, is at all times fixed or locked against rotation relative to its shaft and there is no part which may work loose and give trouble as in the case with the use of a set screw. Furthermore, the use of the improved attaching clip disclosed herein permits the control knob to be readily and quickly removed from its shaft without the aid of a screw driver or other tool, by simply grasping the control knob and pulling it in a direction axially of its shaft.

In the construction shown in the drawing, a control knob 8 is shown provided with an axially disposed circular bore 10 of such size as to snugly receive the end of a shaft 12. The end of the shaft 12 which extends into the control knob is preferably provided on its exterior surface with a plurality of closely spaced serrations 14.

The knob 8 has the bore 10 enlarged or cut away as most clearly shown in Figs. 2 and 4, to provide a substantially flat seat 16 disposed symmetrically with respect to the axis of the bore 10 and spaced from the circumference thereof a predetermined amount as shown at 18. The seat 10 extends axially to a point adjacent the left-hand end or bottom of the bore 10 as shown most clearly in Fig. 3, and the lateral edges thereof are formed to provide shallow grooves 21 and 22. The side walls adjacent said grooves slope or converge toward each other as shown at 24 and 26 respectively and terminate tangentially with respect to the circumference of the bore 10.

The improved attaching clip comprises a sheet metal plate 28 formed of a springy or resilient metal and has two pairs of aligned semi-circular ears or tabs 30 and 32 struck up from the surface of the plate into opposed inclined position as shown most clearly in Figs. 2 and 6. The plate 28 also has a similar struck-out ear or tab 34 protruding from the opposite side thereof, forming a

relatively smaller or lesser angle with respect to the plane of the plate.

The plate 28 is of substantially the same width as the width of the seat 16 so that the grooves 20 and 22 snugly embrace the side edges of the plate when inserted into the opening on the seat 16. The length of the plate 28 is substantially equal to the depth of the seat 16 axially of the knob 8, so that the plate is completely housed within the knob. The metal from which the plate or clip 28 is made is substantially of the same thickness as the space 18 so that the top surface of the plate or clip, when in position on its seat, will snugly contact the outer periphery of the knurled end 14 of shaft 12.

The upstanding ears or tabs 30 and 32 are of such dimension and are so positioned that when the clip or plate 28 is in position on its seat 16, the upper end edges of these tabs or ears will enter and snugly engage the grooves formed by the serrations 14 as shown most clearly in Fig. 2. The tab 34 engages the floor of the seat 16 when the clip is inserted into the knob and acts as a barb to dig or bite into the floor of the clip seat and thereby prevent the ready removal of the clip from the knob when assembled therein. This biting into the floor of the seat is further facilitated by pressure of the shaft 12 against the top surface of the clip which tends to force or urge the tab 34 down into the material of the clip seat.

In the use of this device the plate or clip 28 is inserted into the knob 8 prior to assembly on the shaft 12 with the locking tab 34 extending toward the open end of the knob as shown in Fig. 1. The assembly of control knob and clip is then mounted on the serrated end of the shaft 12 by simply pressing it into place by movement in an axial direction, thereby engaging the upstanding tabs or ears 30 and 32 in the grooves formed by the serrations 14.

When in this position, rotation of the knob in either direction will rotate the shaft 12 and slippage in either direction is prevented at all times by reason of the opposed positions of the locking tabs or ears 30 and 32.

Removal of the knob from the shaft may be accomplished readily at any time by simply grasping the knob and pulling axially relative to the shaft 12, the locking tab or ear 34 preventing the clip from coming out of the knob 8 during such removal of the knob and thereafter unless it is desired to specifically remove the clip from the knob. This may be done by inserting a thin wedge instrument under the center of the clip, thus springing it or bowing it up slightly in the middle and permitting its removal from the seat and edge-engaging grooves of the knob 8.

Although one specific embodiment of this invention has been herein shown and described, it will be understood that details may be altered, omitted, or exemplified, without departing from the spirit of this invention, as defined by the following claim.

What is claimed is:

In the combination of a shaft having a serrated end and control handle for rotating same, a substantially flat sheet metal spring clip seated in said handle so as to be rotatably fixed with respect thereto, a pair of ears struck out from one surface thereof, said ears being oppositely inclined with respect to each other and disposed in a direction between radial and tangential relative to said shaft, and the outer free end edges of said ears having bearing relation against the serrated end of said shaft for exerting a biasing force thereagainst, and an ear struck out from the other surface thereof for engaging the handle so as to prevent easy removal of said clip from said handle.

JOHN NIRDLINGER.