Dec. 5, 1933. E. G. DANIELSON 1,938,556

KNOB

Filed Sept. 15, 1931

FIG. 1

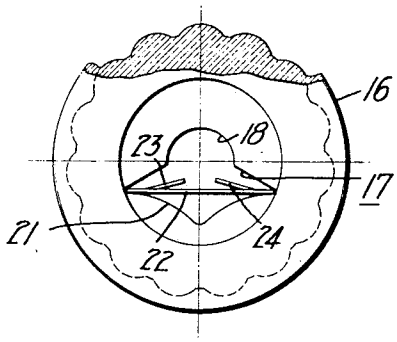
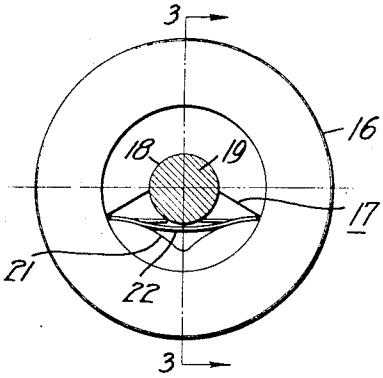


FIG. 2



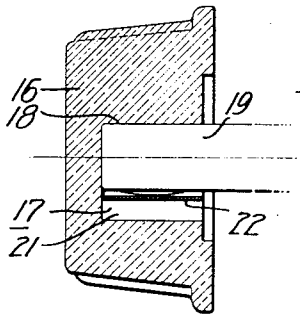


FIG. 3

FIG. 4

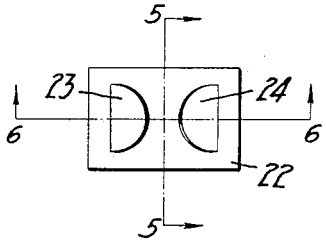


FIG. 5

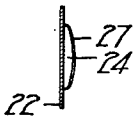
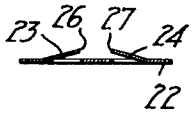


FIG. 6



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Patented Dec. 5, 1933 1,938,556

UNITED STATES PATENT OFFICE

1,938,556

KNOB

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Application September 15, 1931
Serial No. 562,880

2 Claims. (Cl. 287—53)

This invention relates to control knobs and dials for imparting rotational movement to rotatable shafts and is particularly applicable to knobs and dials suitable for effecting adjustment of variable radio apparatus such as condensors, rheostats and the like.

Heretofore, in securing a control knob to the rotatable shaft of apparatus used in radio equipment, it has been common to employ a set screw to interconnect the knob with the shaft. This expedient is unsatisfactory for the reason that it is necessary to interrupt the outline of the knob and provide an unsightly aperture therein for permitting access to the set screw. Also, the screw and the cooperating thread therefor are subjected to wear and after the knob has been removed a few times during normal servicing of the apparatus, the knob sometimes cannot be properly affixed to the shaft.

It is one object of my invention to provide a control knob in which means is disposed interiorly of the knob to interconnect the knob and the shaft in operative relationship and in which the entire exterior surface of the knob is uninterrupted by apertures or the like.

Another object is to provide a knob having resilient means disposed therein for frictionally engaging the curved surface of a rotatable shaft.

A still further object is to provide a resilient connector interposed between a rotatable shaft of the character mentioned and its control knob, means being provided on the connector for engaging the surface of the shaft with a substantially equal frictional force in either direction of rotation.

A further object is to provide a control knob which is readily removable from its associated shaft and which makes firm frictional engagement with the shaft to impart angular adjustments thereto.

These and other objects and advantages are attained in the embodiment of my invention illustrated in the accompanying drawing in which:

Fig. 1 is an elevational view, partly in section, showing the rear side of a knob constructed in accordance with the invention.

Fig. 2 is a rear view of the knob illustrated in Fig. 1 showing the manner in which the same is adapted to be mounted upon a rotatable shaft.

Fig. 3 is a cross sectional view taken along the plane indicated by line 3—3 of Fig. 2.

Fig. 4 is a plan view of a certain resilient clip which can be employed to interconnect the knob with the rotatable shaft.

Fig. 5 is a cross sectional view taken along the plane indicated by line 5—5 of Fig. 4.

Fig. 6 is a cross sectional view taken along the plane indicated by line 6—6 of Fig. 4.

In its preferred form, the knob of my invention comprises a body portion having a cavity disposed therein for the reception of one end of a shaft. The cavity is preferably so formed in cross section that one part thereof is adapted to snugly embrace a portion of the peripheral surface of the shaft, the remainder of the cavity serving to house a resilient clip which is adapted to frictionally engage the opposite portion of the peripheral surface of the shaft. Preferably, the connecting clip is designed to cooperate with a shaft which is circular in cross section and if desired, means can be provided on the clip for increasing the friction between the parts. For example, projecting teeth can be provided which are adapted to engage the shaft and preferably teeth which are disposed in opposite directions relative to the surface of the shaft so that the frictional resistance between the knob and the shaft is approximately the same in either direction of rotation.

Referring now to the drawing, I have shown a knob 16 having an aperture or cavity 17 formed in the rear side thereof. Preferably, the cavity 17 has a cross section as shown in Figs. 1 and 2, one portion 18 of the cavity, shown as the upper portion in the drawing, being formed to snugly embrace a circular shaft 19 along a portion of the peripheral surface of the shaft. Another portion 21 of the cavity is adapted to receive and firmly retain a resilient clip 22 in the form of a flat spring.

The clip 22 serves as a connector between the knob 16 and the shaft 19, the parts assuming the position shown in Fig. 2 with the clip bearing tangentially against the shaft when the knob is assembled on the shaft. In order to increase the frictional resistance against turning movement of the knob relative to the shaft, I preferably provide projecting teeth 23 and 24 on the connector, these teeth being disposed in opposite directions relative to the surface of the shaft and adapted to engage against the shaft when the knob is in assembled position. The teeth 23 and 24 can be formed conveniently by stamping or punching the same from the body portion of the clip 22, as illustrated in Figs. 4 to 6. The teeth 23 and 24 extend at an angle from the body portion of the clip, one making a positive angle therewith and the other making a substantially equal negative angle, so that one

tooth is inclined in one direction relative to the surface of the shaft 19 and the other tooth is inclined in the opposite direction.

Preferably, the biting edges 26 and 27 of the teeth slope upwardly in the direction of the axis of the shaft 19, as viewed from the rear of the knob, so that placing of the knob on the shaft can be started easily, the frictional resistance gradually becoming greater and reaching the maximum value when the knob assumes its proper position on the shaft. As representative of suitable means for accomplishing this object, I have shown the edges 26 and 27 as being semicircular in shape, thereby affording a construction in which engagement of the teeth with the shaft is gradual during the positioning of the knob longitudinally on the shaft.

After the knob has been placed on the shaft, the teeth 23 and 24 bear against the peripheral surface of the shaft in such a manner that one of the teeth prevents relative movement between the knob and the shaft on a clockwise rotation of the knob and the other tooth prevents relative rotation when the knob is turned in a counterclockwise direction. The clip 22 is flexed downwardly, as viewed in Fig. 2, when the knob is placed upon the shaft and sufficient space is provided in the portion 21 of the cavity within the knob to enable this movement.

From the foregoing description, it is believed that the numerous advantages of the knob of the present invention over knobs of prior constructions will be apparent. The exposed surface of the knob is uninterrupted at any place, thereby greatly enhancing its appearance. Since means is provided for engaging the peripheral portion of a circular shaft, a special surface need not be provided on the shaft nor need any other preparation be made for receiving the knob, thereby reducing the cost of construction in this particular. Also, the relatively easy removal and attachment of the knob facilities servicing of radio apparatus on which the knob is employed.

While I have shown and described a preferred embodiment of my invention, it is to be understood that I do not wish to be limited thereto, since the invention, as defined in the appended claims, can be embodied in a plurality of other forms.

I claim:

1. An actuating knob for a rotatable shaft of circular cross section, said knob having a cavity therein to receive one end of the shaft, a flat spring disposed within said cavity having projecting teeth thereon, a portion of said cavity having a cross section corresponding to the curved surface of the shaft and another portion of the cavity being formed to support said spring tangentially against the curved surface of the shaft with the teeth on the spring engaging the shaft.

2. In combination with a knob or like device adapted to be disposed upon a round shaft, said knob having an opening to receive the shaft, a flat spring strip disposed within said knob, the intermediate portion of said spring strip serving to tangentially engage one side of the shaft, and teeth carried by said spring strip intermediate the ends thereof and serving to bite into the peripheral surface of the shaft.

ERNEST G. DANIELSON.