May 11, 1937. G. D. LINDSTROM 2,080,361

RADIO KNOB

Filed March 30, 1933

Fig. 1.

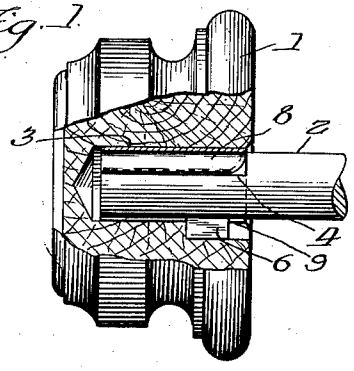


Fig. 2.

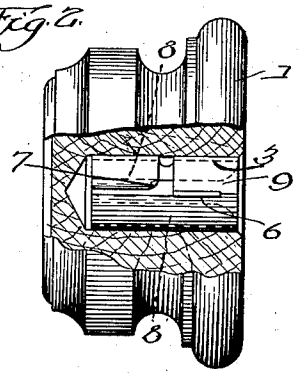


Fig. 3.

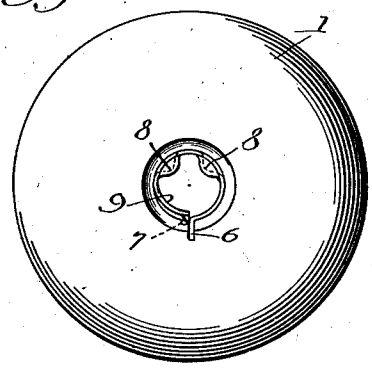


Fig. 4.

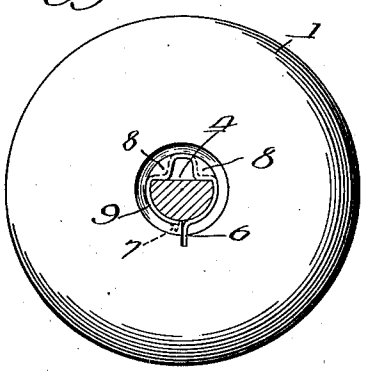


Fig. 5.

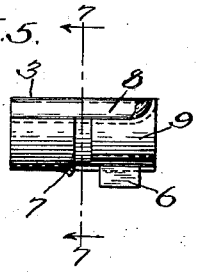


Fig. 6

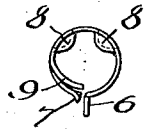
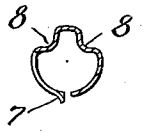


Fig. 7.



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UNITED STATES PATENT OFFICE

2,080,361

RADIO KNOB

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Application March 30, 1933, Serial No. 663,458

13 Claims. (Cl. 287—53)

This invention relates to the attachment of operating knobs or handles to shafts, and more specifically to the attachment of knobs to the shafts of variable adjusting elements of radio receivers.

It is the purpose of this invention to provide a simple inexpensive means for positively but removably securing a knob to a shaft in such a manner as to accommodate for slight variations in shaft size.

Other objects and their resultant advantages will be apparent from the following description given in connection with the drawing, in which:

Fig. 1 is a side elevation of a knob attached to a shaft in accordance with this invention, the center of the knob being broken away to illustrate its attachment to the shaft,

Fig. 2 is a similar view of a knob and attaching bushing,

Fig. 3 is an end elevation of the knob with the attaching bushing inserted therein,

Fig. 4 is an end elevation of a knob and bushing and shaft,

Fig. 5 is a side elevation of the attaching bushing for securing the knob to the shaft,

Fig. 6 is an end elevation of the bushing, and

Fig. 7 is a transverse section taken approximately on line 7—7 of Fig. 5.

Referring to the drawing, there is illustrated a radio knob 1 attached to a shaft 2 by means of a sleeve or bushing 3. That portion of the shaft which enters the knob is deformed in the present instance by being provided with a flat surface 4 extending inwardly from one end of the shaft a distance slightly less than the depth to which the shaft is inserted in the knob.

The bushing 3 for securing the knob to the shaft is a cylindrical-like sleeve member formed of spring metal such as spring steel. The bushing is adapted to be permanently fixed in the knob by being driven into a socket or central bore in the knob. To prevent rotation of the bushing relatively to the knob, the bushing is provided with an outwardly projecting tongue 6 which digs into the fibers of the wood when the bushing is driven into the knob. The tongue 6 being disposed inwardly from the end of the bushing will be driven below the end face of the bushing and the wood fibers will close over the end of the bushing. As an additional means for preventing rotation of the bushing relatively to the knob but more effective to prevent withdrawing of the bushing, the latter is provided with an outwardly projecting tang 7 also projecting from the bushing but in a direction which permits insertion into the knob but prevents withdrawal thereof.

The bushing is provided with a pair of parallel longitudinal struck in ribs 8 which provide longitudinal shoulders for engaging the flattened end surface 4 of shaft 2, the ribs being struck in a sufficient distance to permit the bushing to fit snugly over the end portion of the shaft.

As an aid in frictionally retaining the bushing and knob upon the end of shaft 2 and to accommodate for slight variations in shaft size, the bushing is provided with a flexible and resilient arcuate end segment 9 which normally springs inwardly into the interior of the bushing, as shown in Figs. 3 and 6, but is forced outwardly upon insertion of the shaft.

From the foregoing it will be appreciated that the bushing is fixedly secured to the knob and is tightly and non-rotatably but removably secured to the shaft to permit removal of the knob and bushing from the shaft. The bushing being fixed within the knob, the possibility of the bushing becoming detached from the knob and lost is eliminated. Furthermore, the bushing is so secured in the knob that even upon drying out of the knob the bushing will remain tightly in place due to the tongue 6 and tang 7. The resilient portion 9 makes the bushing self-accommodating to slight variations in shaft size.

Other inherent advantages will be apparent to those skilled in the art to whom it will also be obvious that minor changes may be made in the details of construction without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. The combination with a shaft having a flat end portion and an operating knob therefor, of a resilient bushing comprising a sheet metal sleeve to fit within the knob and on the flat end portion of the shaft for securing the knob and shaft together, the bushing being fixedly secured to said knob and having a longitudinal corrugation providing an inwardly struck rib adapted to engage the flat portion of said shaft and being of sufficient size to frictionally and removably receive the flattened end portion of said shaft.

2. The combination with a shaft having a flat end portion and an operating knob therefor, of a resilient bushing comprising a sheet metal sleeve to fit within the knob and on the flat end portion of said shaft for securing the knob and shaft together, the bushing being fixedly secured to said knob and having longitudinal corruga-

tions providing a pair of parallel inwardly struck ribs adapted to engage the flat portion of said shaft and being of sufficient size to frictionally and removably receive the flattened end portion of said shaft.

3. In combination, a shaft having a deformed end portion, an operating knob therefor and a bushing secured within said knob and frictionally engaging said deformed end portion of the shaft for removably securing said bushing to said shaft, said bushing comprising a sheet metal sleeve having longitudinal corrugations providing a rib struck inwardly and adapted to engage the deformed portion of said shaft, said bushing also being provided with a resilient inwardly sprung segmental portion adapted to frictionally engage the shaft at a point removed from said rib.

4. In combination, a shaft having a deformed end portion, an operating knob therefor and a resilient bushing for securing said knob to said shaft, said bushing comprising a longitudinally corrugated sheet metal sleeve and being provided with an outwardly projecting tang projecting from the bushing in a direction to permit insertion of said bushing into the knob and to prevent withdrawal of the bushing from the knob, said bushing being frictionally and removably secured to said shaft.

5. A resilient bushing for securing a knob to a shaft, comprising a single piece of spring metal in the form of a longitudinally split sleeve adapted to be driven into a socket of the knob and having formed on and struck up from one of its longitudinal edges an outwardly projecting tongue adapted to engage in the material of the knob as the bushing is driven thereinto, said bushing having an inwardly projecting rib adapted to engage the shaft.

6. A resilient bushing for securing a knob to a shaft, comprising a single piece of spring metal in the form of a longitudinally split sleeve adapted to be driven into a socket of the knob and having formed on and struck up from one of its longitudinal edges an outwardly projecting tongue adapted to engage in the material of the knob as the bushing is driven thereinto, said bushing having an inwardly projecting rib adapted to engage the shaft, and an inwardly projecting resilient portion also adapted to engage the shaft.

7. The combination with a shaft and operating knob therefor having a socket receiving the end portion of said shaft, said end portion being flattened, of a resilient bushing comprising a longitudinally corrugated sheet metal sleeve fitted and secured in said socket, said sleeve being a single piece of spring metal and shaped to fit said flattened end of the shaft and embodying a resilient shaft clasping portion.

8. The combination with a shaft and operating knob therefor having a socket receiving the end portion of said shaft, said end portion being flattened, of a resilient bushing fitted and secured in said socket comprising a sheet metal sleeve longitudinally corrugated to provide inwardly stuck ribs for frictionally engaging the flat surface of the shaft.

9. A resilient bushing for securing an operating knob to a shaft comprising a sheet metal sleeve adapted to be driven into the socket of the knob and formed with externally projecting means to fasten itself in the material of the knob, said bushing being formed to fit a parti-cylindrical shaft end and having an inwardly sprung resilient segmental part to engage the cylindrical part of said shaft end.

10. A resilient bushing for securing an operating knob to a shaft comprising a sheet metal sleeve adapted to be driven into the socket of the knob and formed with externally projecting means to fasten itself in the material of the knob, said bushing formed with a pair of inwardly struck longitudinal ribs to engage the flat surface of a parti-cylindrical shaft end and with an inwardly sprung resilient segmental part to engage the cylindrical part of said shaft end.

11. A resilient bushing for securing an operating knob to a shaft comprising a sheet metal sleeve adapted to be driven into the socket of the knob and provided with a struck up outwardly projecting flat tongue to engage in the material of the knob, said tongue being parallel with the axis of the sleeve, also with a tang projecting outwardly in a direction to permit insertion of the bushing but to prevent its withdrawal, said bushing being formed to fit and resiliently clasp a deformed shaft end.

12. In combination, a shaft having a flat portion, a knob having an opening therein for receiving said shaft, attaching means secured in said knob opening comprising a unitary resilient member formed of sheet material and engaging substantially the entire periphery of said shaft including said flat portion, for frictionally attaching said knob to said shaft.

13. A knob having an opening therein for receiving the end of a shaft, and means disposed in said opening for attaching said knob to said shaft, said means comprising a cylindrical member formed of sheet material secured in said opening by an integral portion extending radially into said knob, said cylindrical member being adapted to frictionally receive the end of said shaft.

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