

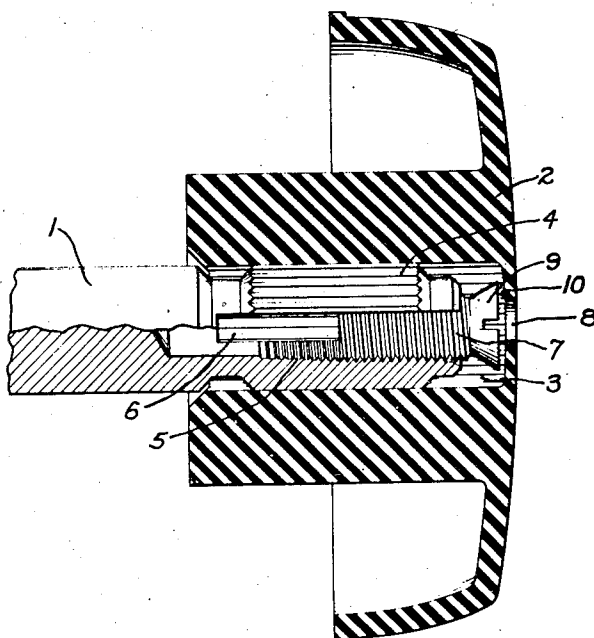
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SHAFT AND CONTROL KNOB ARRANGEMENT

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SHAFT AND CONTROL KNOB
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1 Claim. (Cl. 287—53)

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My invention relates to a knob-and-shaft arrangement of the type commonly used on radio apparatus, as for example, to control the volume or quality of reception or reproduction of a radio receiver, or for similar purposes. It is a primary object of my invention to provide an improved arrangement of this type which facilitates attachment and removal of the knob.

In the case of such a control device, it is customary to provide the outer end of the operating shaft with a detachable knob, the purpose of such knob being to provide a convenient means for adjusting the position of the movable contact of the variable resistance embodied in such a device. Removal of the knob from the shaft on which it is mounted is customarily accomplished by pulling, prying, or other non-uniform application of force, thereby subjecting the structure of the control device to considerable abuse.

One of the particular objects of my invention is to provide a knob-and-shaft arrangement in which a positive driving connection between the knob and shaft is maintained, and in which means are provided for removal of the knob from the shaft by the application of a uniform force, thereby avoiding abuse to the structure of the control device.

Another object of my invention is to facilitate economical production on a quantity basis by avoiding close manufacturing tolerances and by minimizing the necessity for individual adjustments during assembly.

The features of my invention which I believe to be novel are set forth with particularity in the appended claim. My invention itself, however, together with further objects and advantages thereof, may best be understood by reference to the following description taken in connection with the accompanying drawing, in which the single figure is a longitudinal view, partly in transverse section, of a knob-and-shaft arrangement suitably embodying my invention.

In the accompanying drawing, I have shown my invention comprising a shaft 1 on which is mounted a control knob 2, the purpose of which is to provide a means for conveniently rotating the operating shaft. The knob 2 is provided with a socket 3, the diameter of which is larger than the outer diameter of the end of the shaft 4, so that the knob slides easily over the end of the shaft in an axial direction. Both the periphery of the end of the shaft 4 and the interior surface of the knob socket 3 are knurled or fluted to provide matching surfaces. An axial hole 5 of suitable depth is drilled and taper tapped in the

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end of the shaft, such taper tapping being accomplished by the use of a standard machine tap, or other suitable means. A longitudinal slot 6 is also provided to allow radial expansion of the end of the shaft 4.

I provide a mounting screw 7 of suitable size to thread into the tapped hole 5 in the end of the shaft 4 to spread the end of the shaft 4 against the internal surface of the knob socket 3. Such spreading establishes a positive driving contact between the two members.

The knob 2 is provided with a centrally located hole 8, through which the position of the mounting screw 7 is adjusted. The diameter of the hole 8 is less than the diameter of the head of the mounting screw 9, in order that a bearing surface may be established between the head of the screw 9 and the inner surface 10 of the knob.

In assembly, the mounting screw 7 is partially threaded into the axial hole 5 in the end of the shaft 4. The control knob 2 is then slipped over the knurled or fluted end of the shaft 4, and the mounting screw 7 is tightened, thereby forcing the split ends of the shaft to spread and preventing both axial and rotational displacement of the knob with respect to the shaft.

The knob 2 is readily removed from the shaft by loosening the mounting screw 7. The head of the screw 9 may thus be brought to bear on the inner surface 10 of the control knob and force the knob off the shaft. Thus the control device is not subjected to abuse during removal of the knob.

This arrangement provides a method for securely mounting a knob on a control shaft without exposing any of the conducting parts. Thus, if the knob is constructed of an insulating material, protection is obtained from electrical shock in cases where the chassis is operated above ground.

I have also found that an adjustment of the mounting screw of the order of three-eighths inch is sufficient to provide a locking action. Therefore, my arrangement is particularly adaptable to cases where the shaft projection is small.

It will be observed that a pointer may be employed in conjunction with my invention. While in the foregoing the axial hole 5 has been described as being taper tapped, I have found that enlargement of the slot 6 to effect locking of the shaft 1 and the knob 2 may be obtained by using a conventional screw as the mounting screw 7 and relying upon the tapered head 9 to separate the two sides of the slot 6.

What I claim as new and desire to secure by Letters Patent of the United States is:

In combination, a shaft having a longitudinal recess in one end thereof, said shaft being threaded in said recess and being provided on its outer surface at said one end with longitudinally extending splines, said recess decreasing in diameter with displacement from said one end, said shaft being split longitudinally at said one end, a knob having a socket adapted to receive said one end of said shaft, the inner diameter of said socket being larger than the outer diameter of said shaft at said one end, the inner wall surface of said socket having formed integrally therewith a plurality of longitudinally extending splines, a screw adapted to engage said threaded recess to enlarge said split and increase the periphery of said one end, whereby the splined surfaces of said socket and said shaft are pressed into firm engagement as said screw is threaded into said recess, said screw having a slotted head

portion, said knob having a centrally located hole coaxial with said socket, said hole having a diameter smaller than the diameter of said head portion, said slotted head portion being accessible through said hole, and said head portion engaging the inner surface of said socket adjacent said hole as said screw is withdrawn from engagement with said threaded recess to move said knob longitudinally of said shaft.

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REFERENCES CITED

The following references are of record in the file of this patent:

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