

**Oct. 4, 1960**

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CONTROL SHAFT

**2,954,706**

Filed May 15, 1957

2 Sheets-Sheet 1

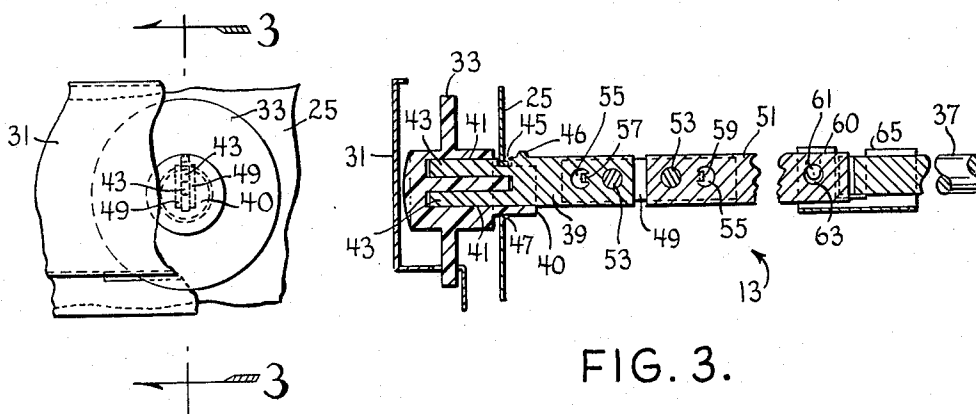
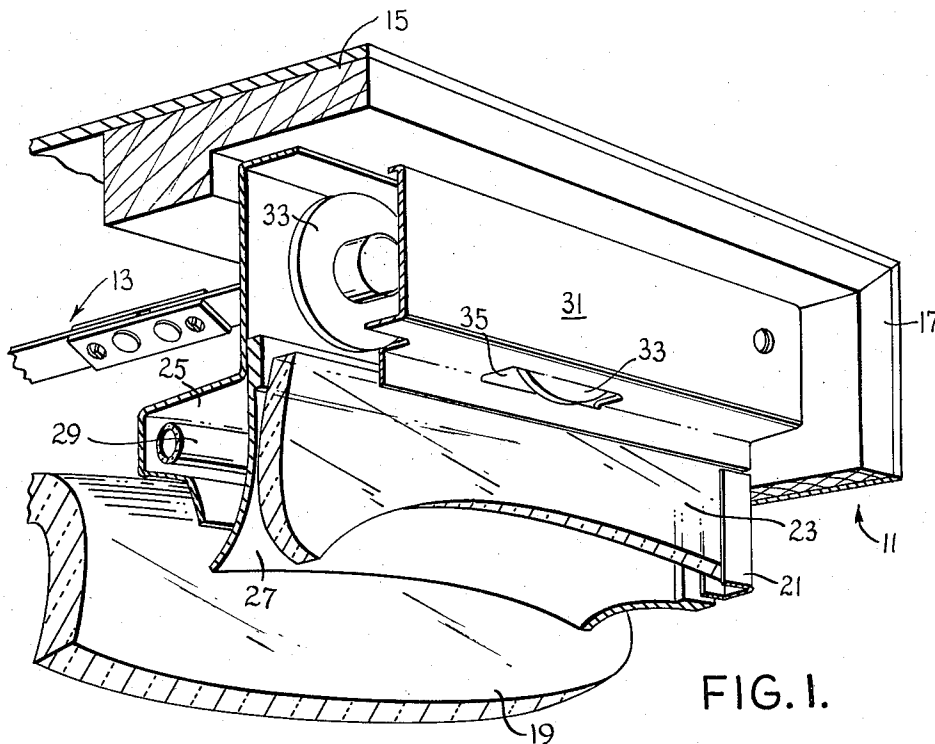


FIG. 2.

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2,954,706

## CONTROL SHAFT

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Filed May 15, 1957, Ser. No. 659,315

2 Claims. (Cl. 74-504)

This invention relates to control mechanisms of the type which provide control elements remote from the device to be controlled.

In many types of apparatus such as electrical communication transmitters and receivers, it is often necessary to have various tuning controls within easy access of an operator, and at a position removed from the device or circuit to be adjusted or tuned. Some difficulty is encountered in providing adequate controls of this type, especially in those instances where certain electrical safety requirements must be met and where the structure must be so constructed that it may be efficiently assembled and dis-assembled. A television receiver is one type of apparatus which necessitates the use of control mechanisms constructed to meet these various specifications.

Accordingly, an object of the invention is to fabricate a mechanism incorporating these features.

A further object is the provision of an improved coupling between adjoining control unit components.

The foregoing objects are achieved in one aspect of the invention by the provision of a linkage which is coupled to a control element or knob by means of a locking member. The coupling is made upon engagement of the knob with the linkage.

For a better understanding of the invention, reference is made to the following description, taken in conjunction with the accompanying drawings in which:

Fig. 1 is a perspective view of one portion of a typical television receiver;

Fig. 2 is a plan view of a portion of the receiver shown in Fig. 1;

Fig. 3 is a section taken along 3-3 of Fig. 2 showing a control mechanism adapted for use with the apparatus shown in Fig. 1; and

Fig. 4 is an exploded view of the elements as shown in Fig. 3.

A portion of the television receiver 11 is shown in Fig. 1 to illustrate the application of control mechanism 13. Receiver 11 has a cabinet 15 which is finished along its extremities with a trim 17. Disposed within the cabinet is a conventional picture tube 19. Mounted upon cabinet 15 is a bracket 21, which serves to support the glass face plate 23 forming the viewing section of receiver 11. A shield or locking member 25 is formed at one end to abut picture tube 19 and at the opposite end for attachment to cabinet 15. Wedged between the shield and face plate 23 is a conventional mask 27 which is formed to circumscribe the viewing area of the tube. The construction of member 25, as shown, may serve the dual function of providing a light shield for a surround lighting lamp 29, in addition to providing the locking means employed with control mechanism 13 as will be hereafter described. Extending across the top of the cabinet is a panel 31 which is formed to substantially enclose the knobs or control elements 33. A plurality of slots 35 are provided in the lower part of panel 31 to allow a portion of the control elements to extend therethrough for easy access by an operator. The knobs

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33 may serve to adjust the contrast, brightness, tuning and volume controls, which are generally provided for customer use in a television receiver.

Referring to Figs. 2-4 it can be seen that control mechanism 13 provides means for tuning electrical units of the type mentioned above with proper manipulation of an electrical unit tuning shaft such as is indicated by the numeral 37. Mechanism 13 includes a rotatable control element or knob 33, shield 25, and link 39. The control element may have a cylindrical shoulder 40 and one or more longitudinal slots 41 formed in its body portion for cooperation with one or more fingers 43 of a flat link 39. One edge of the link is formed with a depression or retaining means 45 and a protrusion 46. Shield 25 has an aperture with a diameter substantially equal to the diameter of shoulder 40 and the width of linkage 39. The aperture is defined by a locking member or rim 47, which is disposed within depression 45 over the width of the depression and in frictional engagement with shoulder 40 over substantially the remainder of the rim circumference. Shoulder 40 may have a shape other than cylindrical. For instance, it may be rectangular in cross section with a major dimension substantially equal to the diameter of rim 47. It can be seen from Fig. 3 that locking member 47 lies along the longitudinal axis of control element 33 while the longitudinal axis of link 39 is off-set therefrom.

Straps 49, which are made of electrical insulating material, connect link 39 with a shaft or rod 51 by means of rivets 53. Spaced apertures 55 are provided in one of the straps to receive the tabs 57 and 59 punched from link 39 and rod 51 respectively. The tabs are formed to provide attachment of the straps to linkage 39 and rod 51.

The end of rod 51 opposite the strap has a connector 60 pivotally attached thereto by virtue of an integral flap 61 extending through an aperture 63 provided in the shaft. Connector 60 is formed with spaced resilient arms 65, which are biased to engage and hold shaft 37 therebetween. Any reasonable variation in manufacturing tolerances of the parts or in the positioning of the control unit components is automatically compensated for by the pivotal mounting of connector 60.

During assembly of mechanism 13, link 39 of a prefabricated assembly comprising link 39, strap 49, rod 51 and connector 60, is first passed through the aperture defined by locking rim 47 until depression or retaining means 45 is aligned with the rim. Connector 60 may then be snapped into engagement with shaft 47 to give the prefabricated assembly support from both ends. Protrusion 46 prevents the assembly from slipping forward through shield 25 during this mounting operation. The link is then raised so that rim 47 extends into depression 45, and control element 33 is then moved into position so that fingers 43 slide into slots 41. Rim 47 is thereby disposed in the depression at one position and in frictional engagement with at least a portion of shoulder 40 at another position. After panel 31 has been mounted upon cabinet 15, the entire control mechanism 13 is so assembled that the parts can not become disconnected. Link 45 cannot move either forward or backward because of the slot and rim arrangement. Also, control 33 is trapped by the panel 31 and fingers 43.

A control mechanism constructed in accordance with the invention facilitates efficient manufacturing procedures due to the ease with which it may be assembled and dis-assembled.

Although one embodiment of the invention has been shown and described, it will be apparent to those skilled in the art that various changes and modifications may

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be made therein without departing from the scope of the invention as defined by the appended claims.

What is claimed is:

1. A control shaft assembly comprising a rotatable control element formed to provide an internal slot and having a longitudinal axis, a link having a finger extending into said slot and a depression formed on one edge thereof, the longitudinal axis of said link being offset from the longitudinal axis of said control element in the direction of said depression, and a locking member 10 formed to provide a rim substantially axially aligned with said control element, said rim being positioned to circumscribe said control element and pass through the depression to lock the link in position relative to the control element.

2. A control shaft assembly for an electrical device having a tuning shaft comprising a rotatable control element with a longitudinal axis, a link formed to engage said control element offset from said longitudinal axis, said link having a depression with the bottom surface 15

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thereof lying substantially along the peripheral surface of said control element, a locking member formed to provide a rim circumscribing the control element and passing through the depression, a rod attached to said link, and a spring connector pivotally mounted upon said rod to provide snap-on engagement with the tuning shaft of the electrical device.

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