Nov. 5, 1957 G. F. HOGBERG 2,811,867

COUPLING

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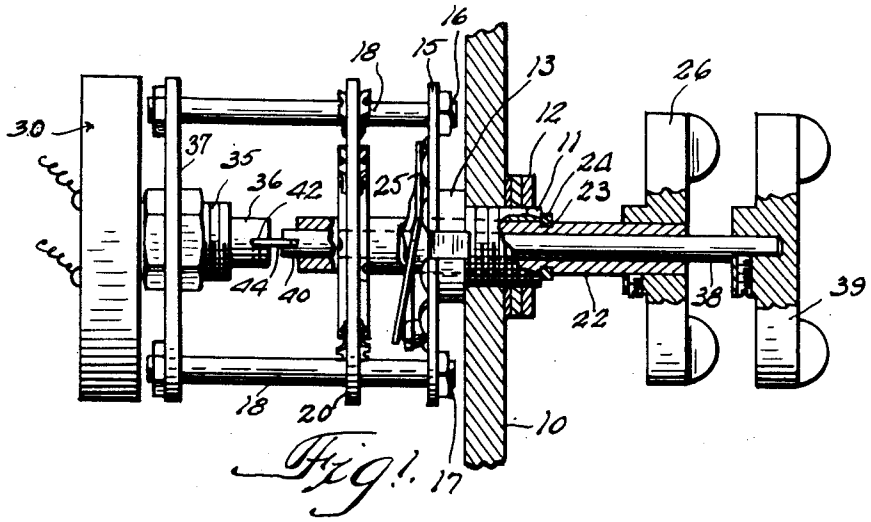


Fig. 1.

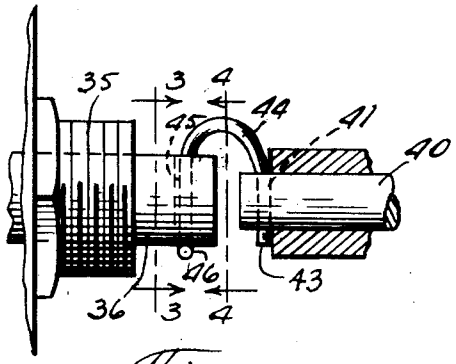


Fig. 2.

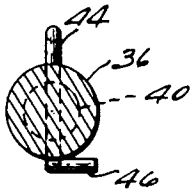


Fig. 3.

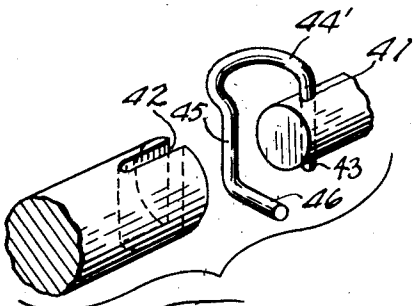


Fig. 5.

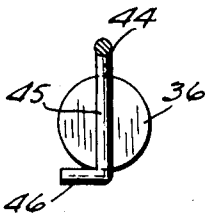


Fig. 4.

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COUPLING

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4 Claims. (Cl. 74—504)

This invention relates to a coupling and is particularly adapted for coupling two separate tandem devices, as for example rotary switches.

In Patent 2,186,949 there is disclosed one form of a rotary switch which is widely used in various types of communication and other electrical apparatus. Usually such rotary switches may have any desired number of sections and are frequently provided with index mechanisms of any desired construction, one example being illustrated in this patent. The switch section or sections illustrated in this patent and other switch sections of different construction are generally mounted upon bolts to maintain the same in predetermined spaced relation. Such a mounting is not too secure for precise mechanical action. However, the lack of rigidity of the mounting is immaterial since the rotors of the switch sections float on the shaft and are only coupled to the shaft for rotation.

It is frequently desirable to add, in tandem, one or more switches or switch sections or rheostats to be controlled separately from the first control section. The different control is most conveniently effected by having one switch or switch section or bank of switch sections operated by a sleeve shaft and the other switch section or bank of switch sections or rheostat operated by a solid control shaft, the latter shaft lying within the former. In some instances, the added switch section which may for example be an off-on toggle switch for turning on a radio receiver, may have its own operating shaft. In any case, even added switch sections are generally designed to accommodate standard size shafts. If the first switch section, having the sleeve shaft, uses a standard size sleeve shaft, then it is clear that the smaller control shaft within the sleeve may be substandard and will not fit the average switch sections.

This invention provides a simple means for connecting the inner solid control shaft to the operating shaft for added control sections, the connection being such that no binding will occur in spite of misalignment and lack of rigidity in the mounting of the various control switch sections.

For a more complete understanding of the invention, reference will now be made to the drawings wherein an exemplary embodiment thereof is shown, it being understood, however, that variations may be made without departing from the scope of the invention, except as defined by the appended claims.

Figure 1 is a side elevation, with certain parts in section and other parts broken away, of a construction illustrating the invention;

Figure 2 is a side elevation of a portion of the construction shown in Figure 1 showing the coupling;

Figure 3 is a sectional detail on line 3—3 of Figure 2;

Figure 4 is a sectional detail on line 4—4 of Figure 2;

Figure 5 is a perspective exploded view of a modified coupling in disconnected form.

Referring to Figure 1, the general switch structure including the invention is illustrated as being secured on

panel 10. Panel 10 is provided with bushing 11 upon which there may be secured a number of nuts 12 for retaining the bushing in position. Bushing 11 has collar 13 at the rear face of the panel. Bushing 11 is carried by index plate 15 of any desired construction, this index plate having apertured portions for accommodating mounting bolts 16 and 17 for the switch. Index plate 15 may have the shape shown in the patent referred to.

Bolts 16 and 17 may have suitable spacing sleeves 18. Switch section 20 is illustrated, this switch section being a first switch for control. It is understood that as many switch sections may be provided as necessary. Switch section 20 is controlled by sleeve shaft 22 extending within bushing 11. Sleeve 22 is slotted at 23 for accommodating a C washer 24. Sleeve 22 is usually permanently attached to index member 25 of the index mechanism. Index member 25 and C washer 24 both cooperate to maintain sleeve 22 in longitudinal desired position. Sleeve 22 may be provided with control knob 26 of any desired construction. Control knob 26 will operate switch section 20 in conventional manner, the index mechanism aiding to control the switch action in a customary manner.

Bolts 16 and 17 also support additional control section generally indicated by numeral 30. Control section 30 may, if desired, include a combined toggle switch and volume control in a manner widely used in the radio and television receiver art. As is well known, the volume control and toggle switch assembly is generally provided with bushing 35 having the same general construction as bushing 11. Bushing 35 has its own operating shaft 36 for operating control switch section 30. Auxiliary mounting plate 37 is bolted to bushing 35 and bolts 16 and 17.

As will be readily apparent, the mounting of the added control section on bolts 16 and 17 does not provide sufficient alignment for a conventional coupling. For turning shaft 36, control shaft 38 is disposed within shaft sleeve 22. Shaft 38 carries knob 39 at the end thereof. Shaft 38 has exposed end portion 40 extending beyond the free end of sleeve 22. End 40 of the shaft is provided with transverse aperture 41. The cooperating end of shaft 36 is provided with transverse slot 42. For convenience, the width of slot 42 is substantially equal to the diameter of aperture 41. The coupling member consists of a wire having straight portion 43 extending through aperture 41 as a pin. Coupling portion 44 is disposed between portions 43 and 45. Locking portion 46 is at right angles to and at the end of slot-engaging portion 45.

In the form of the invention illustrated in Figures 1 to 4 inclusive, coupling portion 44 is arched as shown so that parts 43 to 45 inclusive form a U with a rounded bottom.

It is clear that coupling member 44 may be positioned in shaft 38 as illustrated in Figure 5. Then the added control section generally indicated by numeral 30 may be advanced forwardly into position with slot 42 so oriented that part 45 of the coupling member can enter the same. As long as the control sections are in predetermined spaced positions from each other, locking portion 46 of the coupling will prevent the wire coupling member from falling out. It is obvious that a universal coupling movement is provided and that suitable misalignment between operating shaft 36 and control shaft 38 will be tolerated.

By having apertured part 40 of shaft 38 just beyond the end of sleeve shaft 22, shaft 38 will be locked against outward movement. Additional switch sections may be carried by auxiliary plate 37 so that the additional control section may be any desired rotary device. Shaft 36

may be the same diameter as sleeve 22 so that standard size switch sections may be used throughout.

Part 44 may be straight so that parts 43 to 45 inclusive will form a U with a square or flat bottom. The arched form illustrated is preferred since the beginning of the arch at aperture 41 limits the drop of portion 43 and maintains portion 44 clear of slotted part 42. This makes for smoother action.

In Figure 5, a modification is shown wherein coupling part 44' is offset preferably away from the direction of part 46. Part 44' may be curved or straight.

What is claimed is:

1. A construction for two rotary devices for tandem control comprising two separate devices having stationary and rotary parts, means for mounting said two devices in generally aligned relation, one device being in front and having a sleeve, the other device being rearwardly of the one device and having an operating shaft, a control shaft passing through the sleeve and having an exposed portion extending beyond the same toward the opposed end of the operating shaft, said control shaft and operating shaft having spaced generally alined shaft portions, one shaft portion having a transverse aperture therethrough near the end, the other shaft portion having its end slotted transversely and a wire member having a generally U-shaped part extending through the aperture and slot, and having a bent portion at the end for hooking under the slotted end of the shaft portion to prevent said wire member from falling out.

2. The construction according to claim 1 wherein the control shaft has the transverse aperture near the sleeve end and the operating shaft has the slotted shaft portion.

3. The construction according to claim 2 wherein the bottom of the U is laterally offset.

4. The construction according to claim 3 wherein the bottom of the U is curved.

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