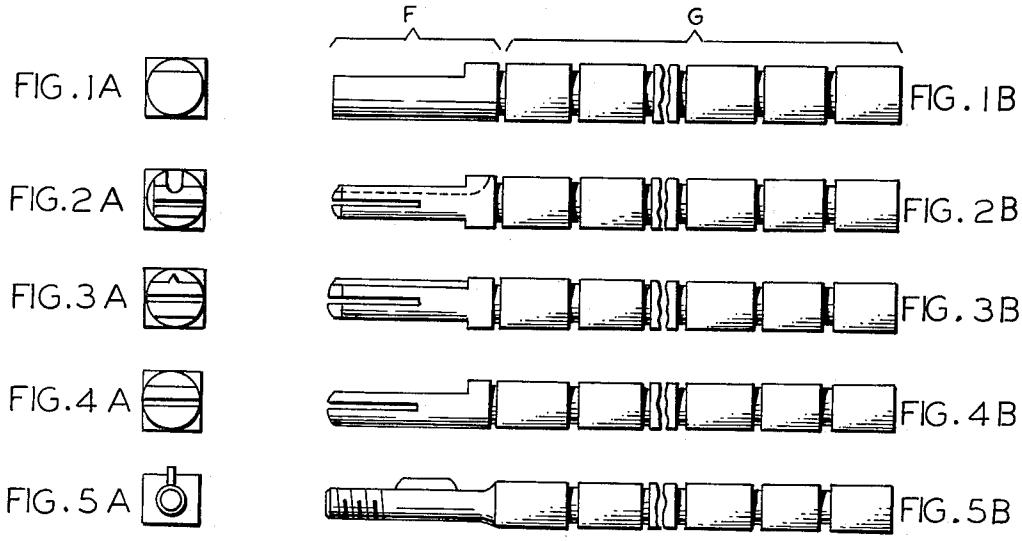
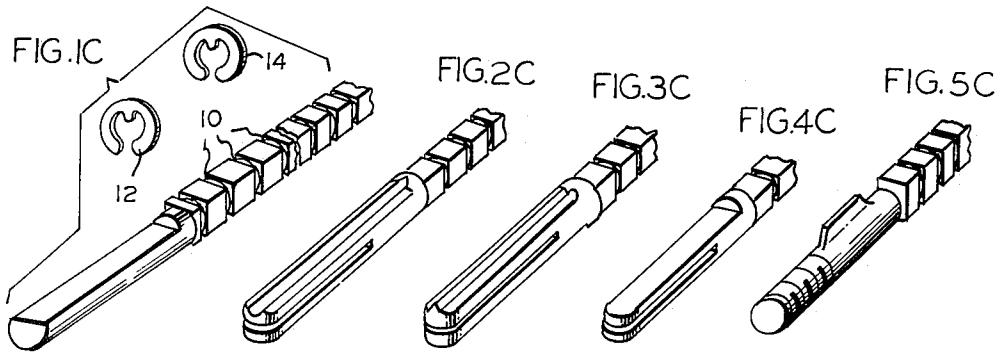
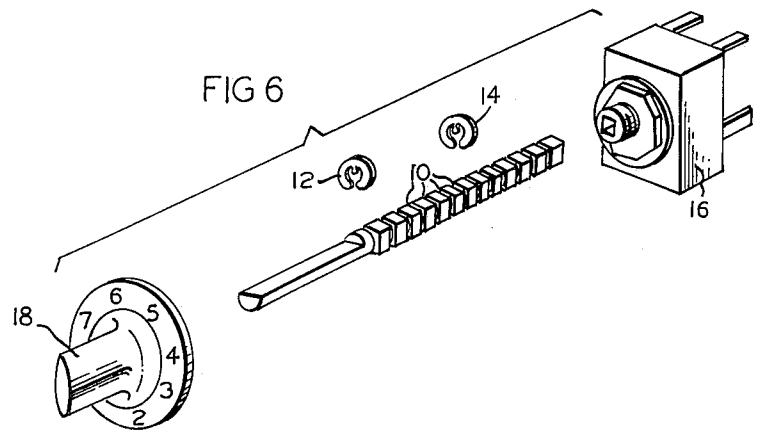
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ELECTRICAL SWITCH ASSEMBLY AND SHAFT THEREFOR

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ELECTRICAL SWITCH ASSEMBLY AND SHAFT THEREFOR

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This invention generally relates to the replacement or electrical switches and especially those electrical switches used on electrical stoves and ranges. In particular, this invention relates to the construction and installation of shafts for such switches.

As is well known, electrical stoves and cooking ranges are usually provided with at least two, and sometimes as many as ten or more, electrical switches which enable the housewife to adjust the heat that is applied to whatever she is cooking. These switches usually consist of a control shaft having one end connected to a knob and the other end connected to or passing through a switch control box. When a switch begins to work improperly, or fails altogether, the housewife usually calls in a serviceman. When the serviceman is sure that a switch is defective it is usually most expedient and least expensive to merely replace it by removing the knob, disconnecting the terminals of the switch control box from the source of power and then removing both the control shaft and the switch control box. The easiest and simplest thing that the serviceman could do then would be to replace the removed components with a new control shaft and a new switch control box made by that same manufacturer. However, since there are so many switch manufacturers, it is not usually feasible for the serviceman to carry a complete selection of switches, and as a consequence, the serviceman often will not have with him the particular brand of control shaft and switch control box that he removed. The serviceman then has two choices. First of all, he can return to his office and place an order with the original switch manufacturer for another switch; but this is seldom satisfactory because deliveries often take as long as six weeks and in any event another service call is required at a later date (with its attendant time and costs). Alternatively, the serviceman can immediately replace the defective switch with a switch of another manufacturer. However, the difficulty with this procedure is that more often than not the knob which fitted the first manufacturer's switch will not fit the second manufacturer's switch, and a housewife will generally not accept a different control knob because it doesn't match her other knobs.

The primary object of the present invention is to overcome the aforesaid problems by providing a control shaft that can be adapted for use with the switch control boxes of a number of different manufacturers. These, as well as other objects and advantages will be readily apparent after studying the remainder of this application. However, before explaining the present invention in detail, it should be understood that the invention is not limited in its application to the specific details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring now to the drawings:

FIGURES 1A–5A are end views of control shafts in accordance with this invention;

FIGURES 1B–5B are side views of control shafts in accordance with this invention;

FIGURES 1C–5C are fragmentary perspective views of control shafts in accordance with this invention;

FIGURE 6 is an exploded perspective view of a control knob, a control shaft and a switch box.

In accordance with this invention, when a serviceman encounters a defective switch he carries out the following steps:

(a) the control knob is removed;

(b) the terminals of the rotary switch control box portion of the switch are disconnected from the electrical circuit;

(c) the control shaft and switch box portion are removed either separately or as a unit;

(d) a new switch box, which need not have been made by the original manufacturer, is selected;

(e) a new control shaft constructed in accordance with this invention is fitted into the new switch box;

(f) the control shaft of this invention is then secured in place by positioning washers, and preferably spring washers on opposite sides of the switch box in circumferential grooves located in the shaft;

(g) any undesired excess portion of the shaft is then broken off;

(h) the terminals to the new rotary switch control box portion are reconnected; and

(i) the control knob is placed on the front end of said control shaft.

The essential novelty of this invention centers around the above-mentioned control shaft. Considered from one aspect this control shaft comprises:

(a) an elongated shaft;

(b) the front end portion of said elongated shaft being contoured to receive and hold a control knob;

(c) the remainder of said shaft being longer than said front end portion, and preferably being:

(1) substantially square in cross section along most of its length,

(2) provided with a plurality of spaced apart circumferential grooves that are parallel to each other and perpendicular to the axis of the shaft, thus forming a plurality of shaft segments, said grooves being deep enough to permit easy breaking off of any desired number of segments.

Referring now to the drawings, five different types of control shafts are shown in FIGURES 1A, B, C; 2A, B, C; 3A, B, C; 4A, B, C; and 5A, B, C. In looking at side views of these control shafts aligned one above the other (FIGURES 1B, 2B, 3B, and 4B and 5B) it will be seen that they each comprise a front end portion (indicated by the bracket F) and a remainder portion (indicated by the bracket G). The front end portion F (which is preferably between about one inch and one and one-eighth inches long) is different in each of the five embodiments shown, each front end portion being contoured differently to fit a particular knob. I have found that these five variations in the contouring of the front end portions, as shown in the various views, will accommodate nearly any knob now on the market. Since the precise contouring of these front end portions is not the essence of this invention, they will not be described in greater detail here, other than to refer to the various views. In a preferred specific embodiment the shafts have a length of approximately five and one-quarter inches. Again, in looking at the side views of the control shafts it will be seen that they each contain a remainder portion (indicated by the bracket G). This remainder portion G is preferably substantially square in cross section along its entire length. In a preferred embodiment this remainder portion consists of 3/16" square steel key stock and is approximately three and one-eighth inches long.

As can also be seen from the drawing, this remainder portion is provided with a plurality of spaced apart circumferential grooves 10 that are parallel to each other and

perpendicular to the axis of the shaft, thus dividing the remainder portion into a plurality of shaft segments. In a preferred embodiment there are **12** grooves and **12** shaft segments although the number could be greater or smaller. Preferably the remainder portion has at least six shaft segments and preferably no more than **20** shaft segments. The circumferential grooves are made deep enough to permit easy breaking off of any desired number of segments. Preferably the circumferential grooves are 1/32" deep and 1/32" wide in the case of 3/16" steel key stock. The grooves need not all be spaced the same distance apart, but this is usually preferable.

When the remainder portion of the control shaft is segmented in this manner, it is relatively easy to break off any desired number of segments after the control shaft has been inserted through a selected switch box unit.

A spring washer, having a shape such as that shown at **12** in FIGURES 1C and 6, can then be inserted in a groove **10** near the front end of the shaft and another similar spring washer **14** secured to a groove further back on the control shaft so as to securely hold or clamp the switch box **16** therebetween. The knob **18** can then be placed on the front end of the shaft.

Since the control shafts shown in the drawings can be adapted to fit nearly all of the control knobs now on the market and a good many switch boxes, all that a serviceman for ranges and cookstoves need do is to carry a supply or kit of these novel control shafts with him (together with a supply of suitable switch boxes) and he can then quickly repair or replace any switch unit that he encounters—without the necessity for a second trip. This enables the servicemen to service a greater number of people with less time, less trouble and less expense. Huge inventory stocks are eliminated.

In conclusion, while there have been illustrated and described some preferred embodiments of my invention, it is to be understood that since the various details of constructure may obviously be varied considerably without really departing from the basic principles and teachings of this invention, I do not limit myself to the precise construction herein disclosed and the right is specifically reserved to encompass all changes and modifications coming within the scope of the invention as defined in the appended claims. By way of example, it would not involve invention to make the shaft octagonal, serrated, or some other shape that was functionally equivalent to a square cross section.

I claim as my invention:

1. A novel control shaft for electrical switches which comprises:

(a) an elongated shaft having a length of approximately five and one-quarter inches,

(b) the front end portion of said elongated shaft being between about one inch and one and one-eighth inches long and being contoured to receive and hold a control knob,

(c) the remainder of said shaft being about three and one-eighth inches long and being:

(1) substantially square in cross section along most of its length, the sides of said square being approximately three-sixteenths of an inch,

(2) provided with approximately twelve spaced apart circumferential grooves that are parallel to each other and perpendicular to the axis of shaft, thus forming approximately twelve shaft segments, said grooves being about one thirty-second of an inch wide and one thirty-second of an inch deep to permit easy breaking off of any desired number of segments.

2. A novel control shaft for electrical switches which comprises:

(a) an elongated shaft,

(b) the front end portion of said elongated shaft being contoured to receive and hold a control knob,

(c) the remainder of said shaft being longer than said front end portion, and being provided with a plurality of spaced apart circumferential grooves that are parallel to each other and perpendicular to the axis of the shaft, thus forming between 6 and 20 shaft segments, said grooves being deep enough to permit easy breaking off of any desired number of segments.

3. An electrical switch unit comprising in combination a control shaft having one end connected to a knob and the other end passing through a switch control box, said control shaft being as defined in claim **1** and said switch control box being held on said shaft by means of spring washers engaging spaced apart circumferential grooves on said control shaft on opposite sides of said switch control box.

4. An electrical switch assembly comprising:

(a) an elongated shaft,

(b) one end of said elongated shaft being contoured to receive a control knob,

(c) at least an intermediate portion of said shaft being divided into between six and twenty segments by circumferential grooves that are perpendicular to the axis of the shaft,

(d) a switch box mounted on said elongated shaft, and

(e) detachable retaining means that are mounted on said intermediate portion of said elongated shaft and which function to retain the switch box therebetween.

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