Nov. 30, 1943. O. CONRADTY ET AL 2,335,388

SWITCHING DEVICE

Filed Jan. 15, 1941

Fig. 1

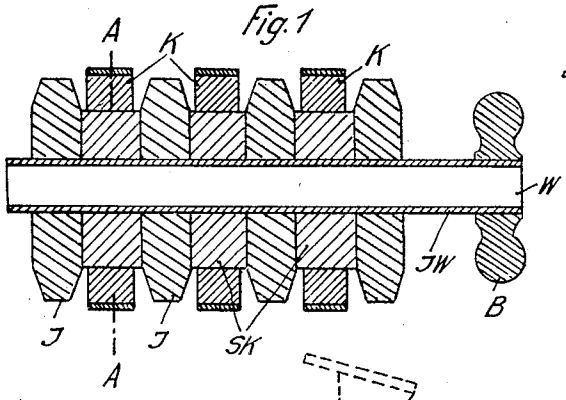


Fig. 2

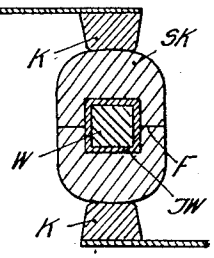


Fig. 3

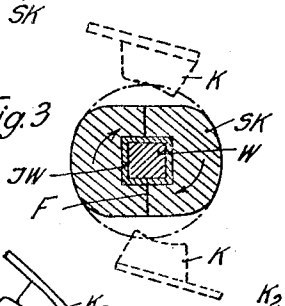


Fig. 4

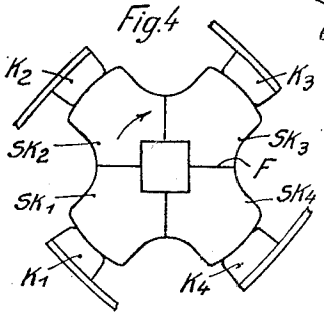


Fig. 5

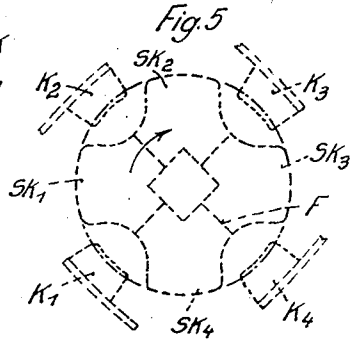


Fig. 6

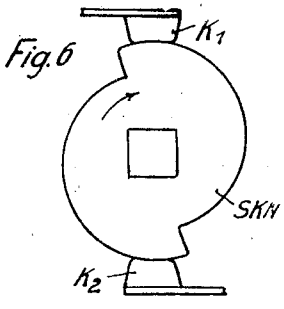
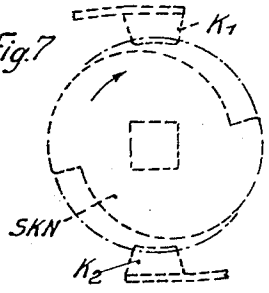


Fig. 7



Inventors:
Ottmar Conradty and
Hans Zöllner
By
Young, Emery & Thompson
Attorneys

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UNITED STATES PATENT OFFICE

2,335,388

SWITCHING DEVICE

Ottmar Conradty, Rothenbach-on-the-Pegnitz, and Hans Zöllner, Lauf-on-the-Pegnitz, Germany; vested in the Alien Property Custodian

Application January 15, 1941, Serial No. 374,599
In Germany October 9, 1939

1 Claim. (Cl. 200—153)

This invention relates to switching devices or controllers and has particular reference to drum type switches.

It is an object of the present invention to provide a switching device which avoids the defects of the known devices having metal contact pieces on the drum or controller cylinder.

A special object of the present invention is to provide contact pieces of a material ensuring a reliable switching action and preventing the formation of sparks and other phenomena inherent to controllers having metal contact pieces.

With these and further objects in view, as may become apparent from the within disclosures, the invention consists not only in the structures herein pointed out and illustrated by the drawing, but includes further structures coming within the scope of what hereinafter may be claimed.

The character of the invention, however, may be best understood by reference to certain of its structural forms, as illustrated by the accompanying drawing in which:

Fig. 1 is an axial section of a controller cylinder having the invention applied thereto.

Fig. 2 is a section on line A—A of Fig. 1, showing the parts in their switched-in position.

Fig. 3 is a similar section, showing the parts in their switched-off position.

Fig. 4 is an end elevation showing a modification in the switched-in position of the parts.

Fig. 5 is a similar elevation showing the parts in their switched-off position.

Fig. 6 is an end elevation of another modification, switched-in, and

Fig. 7 is a similar elevation in switched-off position of the parts.

Similar characters of reference denote similar parts in the different views.

According to the present invention, the active contact pieces of the drum type switch consist of artificial carbon or graphite material. The use of such artificial carbon or graphite material offers considerable advantages over metal contacts, since the carbon material is not liable to evaporation and burning off as a result of the breaking sparks occurring in switching devices of the kind referred to. Therefore, no molten beads are produced as with metal contacts and the carbon contacts do not require permanent attendance as by greasing. Also their duration of life exceeds that of metal contacts. Furthermore, the oxide layers produced on the surface of metal contacts of drum type switches owing to the influence of the atmosphere which interfere with the passage of current do not occur with our novel carbon contacts.

In the practice of our invention the switching drum is composed of a plurality of contact disks of carbon or graphite material arranged in series with intermediate insulating parts on a common shaft, from which the carbon disks are insulated.

Referring now to the drawing in greater detail and first to Figs. 1, 2 and 3, it will be noted that a plurality of carbon disks SK and intermediate insulating and spacer disks J are mounted on a sleeve JW of insulating material surrounding the drum shaft W. The shaft may be operated by a hand wheel B or by an operating lever. As best seen from Figs. 2 and 3, the carbon disks SK are capable of engaging stationary contacts K (Fig. 2) or, by turning the shaft through an angle of 90°, may be removed from said contacts, thus breaking the passage of current from or to said contacts K (Fig. 3). To this end the contact disks are made with an oval shape as seen from Figs. 2 and 3, or in other words, the disks are circular plates with partly flattened circumferential faces. As indicated in Figs. 2 and 3, the disks SK may consist of two parts each, which at their abutting faces may be in direct electrical contact or provided with intermediate insulating layers F, depending upon the switching operations to be performed by the device. Irrespective of its conductive or insulating character, the intermediate layer F will include a cement for holding the two carbon parts together.

By way of alternative, the contact disks may consist of four or more parts SK_1, SK_2, SK_3, SK_4, as shown in Figs. 4 and 5, the parts SK_1, SK_2, SK_3, SK_4, being electrically connected or insulated from one another at F, for engagement with, or disengagement from, stationary contacts K_1, K_2, K_3, K_4. To this end, the contact disks are formed with cam portions and intermediate recesses corresponding in number to the number of contact points, as shown in Figs. 4 and 5. It will be noted from Fig. 4 that the edges of the outer contact surfaces of the segments SK_1 to SK_4 curve inwardly and then form reentrant curves extending to the faces in contact with adjacent segments; also that the edges of the contact faces of the contacts K_1 to K_4 curves away from the outer faces of the segments. Any arcing which occurs on breaking the circuit does not occur at the face but at the sides of the segmental and spring contacts.

Referring now to Figs. 6 and 7, it will be noted that the carbon disk SKN in this case is in the form of an eccentric cam disk which may be required, for instance, to effect a rapid interruption of the current between the stationary contacts K_1, K_2, by rotation of the disk in the direction of the arrow.

The method and apparatus of the present invention have been described in detail with reference to specific embodiments. It is to be understood, however, that the invention is not limited by such specific reference but is broader in scope and capable of other embodiments than those specifically described and illustrated in the drawing.

We claim:

A drum type switching device comprising spring pressed stationary contacts, a non-round drum shaft, a plurality of carbon segments fitting said shaft and formed with radial faces cemented to one another, said segments having outer circumferential contact faces curved inwardly at their edges and joining said faces in a reentrant curve.

OTTMAR CONRADTY.
HANS ZÖLLNER.