

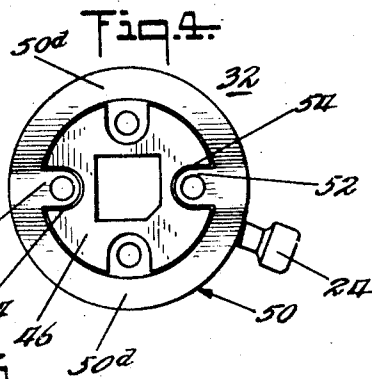
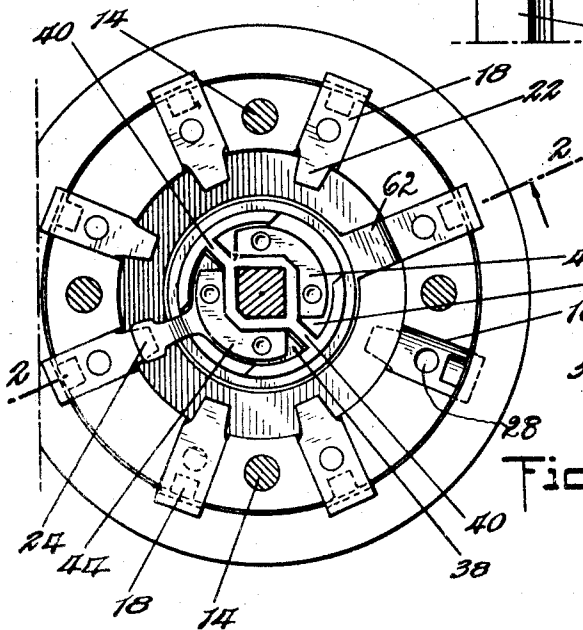
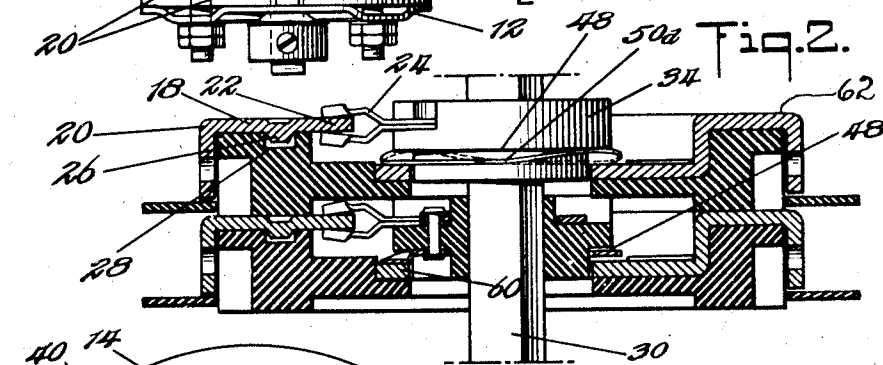
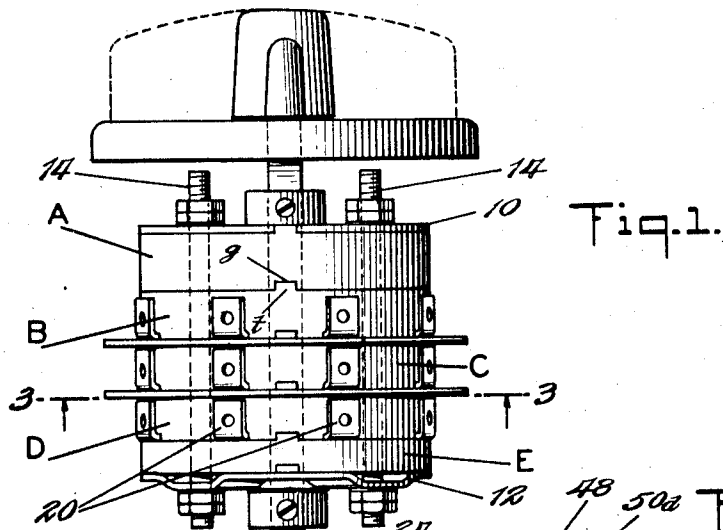
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ROTARY SELECTOR SWITCH

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## ROTARY SELECTOR SWITCH

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This invention relates to electric switches and more particularly to rotary electric switches for controlling multiple circuits by selective engagement of one or another of a plurality of contacts as the rotary switch element is turned to a plurality of positions.

An object of the invention is to provide an improved movable contact structure member useful in the above type of rotary switch and which may be inexpensively manufactured and easily replaced or assembled in the switch.

Another object of the invention is to provide, in a switch of the foregoing type, a novel form of rotary contact element which will provide for adequate contact pressure between the collector ring and a rotary brush or wiping contact member that engages therewith and wipes thereover during the rotary action of the switch.

Other objects and advantages of the invention will become apparent as it is described in connection with the accompanying drawing.

In the drawing:

Figure 1 is an elevation view of a switch embodying the invention;

Figure 2 is a vertical section view taken along line 2—2 of Fig. 3 through two sections of the switch illustrated in Fig. 1;

Figure 3 is a transverse section view taken along line 3—3 of Fig. 1;

Figure 4 is a plan view of one face of the rotary switch contact member, the other face thereof being shown in Fig. 3.

Referring to the drawings, the invention is illustrated as used in rotary switches which are built up of a plurality of identical nested insulating discs B, C, D. These, together with a top disc A, housing indexing means, and a bottom disc E, forming an insulating cover, make up a cylindrical insulating base or switch body. The structure of sections A and E need not be described particularly since they and their contents form no part of the present invention. The discs B, C and D are identical and may be of any desired number, with flat faces adapted to seat against the adjacent flat faces of the discs above and below. To position one section with respect to another, a lug or tongue *t* is molded to extend from one face of each section in a recess or groove *g* in the opposite face of the neighboring section.

Each of the sections B, C and D is formed with a large central circular aperture. From both faces the disc is recessed to form wells which, when the neighboring sections are put together, form a cylindrical cavity for the reception of the fixed and movable switch parts.

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Metallic top and bottom plates 10 and 12 may be placed against the top and bottom surfaces of the nested sections and the whole assembly may be held together by means of four bolts 14 passing through registering apertures in the top and bottom plates and all sections.

Referring to sections B, C and D, the bottom surface of each section is provided with a plurality of radially extending channel recesses or slots 16 for the reception of identical contact and terminal members 18. These contact and terminal members may be stamped from sheet metal into angulate form to provide a portion 20 extending outside of the disc and bent to lie parallel to the peripheral surface of the disc. These extending portions may have threaded apertures for the reception of conventional terminal screws, not shown. Internally extending from the main body of the contact and terminal members are contact portions 22 for engagement, selectively, on top and bottom surfaces by the flexible blades of a movable contact 24 hereinafter to be more particularly described. To keep the contact and terminal members 18 from sliding out of their recesses when the switch is assembled, there may be pressed out of the plane of the body of said members a circular boss or protuberance 26 to be received within a complementary depression or well 28 in the groove. Thus, when the parts are assembled the contact and terminal member will be seated within its complementary groove 16 with its surface flush with the surface of the disc so that the surface of the neighboring section will hold the terminal seated in the groove. At the same time the boss 26 will enter the well 28 to prevent the terminal from moving radially out of the groove.

For operating the movable switch parts, a spindle 30 of substantially square section extends through the center of all of the discs which make up the base. Slidably mounted upon the spindle are rotary contact members 32 each comprising a circular disc 34 molded from insulating material. In one surface (the bottom, as assembled; the top, in Fig. 2) of this insulating disc are molded arcuate recesses 36, 38 which are separated by radial barriers 40 in diametrically opposite positions. Secured within radial recess 36 is an arcuate metallic member 42. In the other arcuate recess is secured an arcuate metallic member 44 similar to 42 and beneath it are held arcuate end portions of the movable contact blades 24 comprising a pair of flexible sheet metal stampings having contact fingers extend-

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ing radially outward from the just-mentioned arcuate portions. The ends of the fingers are bent oppositely so as to engage opposite sides of the fixed contact portions of the several contact and terminal members as the contact member is rotated. On the opposite side of the rotary disc 34 (see Figs. 2 and 4) a circular head 46 of less diameter than the body of the disc is formed, creating a shoulder 48. On this shoulder at diametrically opposite points is secured a wiping contact 50 in the form of a thin flexible metal ring with a pair of radially inwardly extending lugs 52 which are adapted to seat within complementary radial diametrically opposite recesses 54 in the head 46. The wiping contact is secured on the disc shoulder 48 and is connected to the movable contact blades 24 on the opposite side thereof by means of rivets which penetrate the lugs 52 and the disc 34 and the blades 24. Diametrically opposite portions 50d of the wiping contact are deformed by bending out of the normal plane of the ring so that those portions are spaced from the shoulder 48 but because of the resiliency of their material they can move toward the shoulder 48 when pressure is applied.

The wiping contact 50 has wiping engagement with a collector ring 60 countersunk in an annular recess around a central aperture in each of discs B, C and D. A terminal bar 62, integral with the ring, extends radially outward and is bent in U-shape at the periphery of the disc (B) so as to enter and lie in one of the radial grooves 16. The extreme outer end of this terminal bar portion extends outside the disc (B) and has its extremity bent parallel to the peripheral surface of the disc, like terminals 20.

The rotary member 32 is made of such overall thickness that when the upper surface thereof (as viewed in Fig. 2) engages the lower surface of the disc above it, the rotary member 34 will be pressed thereby toward the collector ring and the deformed portions of the wiping contact will resiliently engage the collector ring to form an electrical connection of good conductivity by reason of the continued pressure of the inherent resiliency of the wiping contact upon the collector ring.

From the foregoing it may be observed that when assembled as illustrated in the drawings the switch spindle may be rotated by a conventional handle to cause the turning of the rotary contact member 32 so that one or another of the several fixed contact fingers may be engaged or disengaged by contact blades 24. Firm electrical contact will at all times be maintained between the collector ring and the wiping contact so that current passing through the collector ring will pass through the wiping contact and the rivet which secures it to the movable contact blades and thence to the selected fixed contact.

The described structure also provides for simple assembly of the fixed contacts and terminals and firm securing of them in the switch as the desired number of sections are nested together and bolted.

Many modifications within the scope of the invention will occur to those skilled in the art. Therefore I do not limit the invention to the specific embodiment disclosed.

I claim:

1. In a rotary switch, an insulating body, a collector ring mounted on said body, a plurality of stationary contacts arranged concentric with the collector ring axis, a rotary contact member comprising an insulating disc, a contact blade engage-

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able with said plural contacts, a thin flexible wiping contact of substantially annular shape formed separately from but electrically connected to said blade, means securing said blade and said wiping contact fixedly on said disc, a part of said wiping contact being bowed out of the plane of other parts thereof to provide for inherently resilient engagement of said wiping contact with said collector ring, and means to press said rotary member toward said collector ring to maintain contact pressure between said wiping contact and collector ring.

2. In a rotary switch, an insulating body, a collector ring mounted on said body, a plurality of stationary contacts arranged concentric with the collector ring axis, a rotary contact member comprising an insulating disc, a contact blade on one side of said disc, a resilient non-planar wiping contact on the opposite side of said disc, means connecting said wiping contact and blade and securing them to said disc, and means to press said rotary member toward said collector ring to maintain contact pressure between said wiping contact and collector ring.

3. In a rotary switch, an insulating body, a collector ring mounted on said body, a plurality of stationary contacts arranged concentric with the collector ring axis, a rotary contact member comprising a molded insulating disc formed with a shoulder adjacent its periphery, a thin flexible bent wiping contact affixed on said shoulder, a contact blade electrically connected to said wiping contact, and means to press said rotary member toward said collector ring to maintain contact pressure between said wiping contact and collector ring.

4. In a rotary switch, an insulating body, a collector ring mounted on said body, a plurality of stationary contacts arranged concentric with the collector ring axis, a rotary contact member comprising a molded insulating disc formed with an annular shoulder adjacent its periphery, a resilient annular wiping contact held on said shoulder and having portions bent away from said disc, and a contact blade mounted on said disc and electrically connected to said wiping contact.

5. In a rotary switch, plural nested insulating bodies centrally apertured, an operating spindle extending through said bodies, a plurality of stationary contacts seated in recesses in one face of at least one body and arranged around the spindle and held in said recesses by the adjacent body, said bodies having adjacent faces recessed to provide a cavity therebetween, a collector ring in the cavity, a rotary contact member mounted on said spindle having a blade engageable with said stationary contacts, and a boss punched out of the surface of the stationary contacts and received in complementary wells in the contact receiving recesses to hold the contacts in said recesses.

6. In a rotary switch, plural nested insulating bodies centrally apertured, an operating spindle extending through said bodies, a plurality of stationary contacts seated in recesses in one face of at least one body and arranged around the spindle and held in said recesses by the adjacent body, said bodies having adjacent faces recessed to provide a cavity therebetween, a collector ring in the cavity, a rotary contact member mounted on said spindle comprising an insulating disc, a contact blade on said disc, a resilient bent wiping contact held in resilient engagement with said collector ring by said ad-

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jacent body, and means to hold said bodies in assembled position.

7. In a rotary switch, plural nested insulating bodies centrally apertured, an operating spindle extending through said bodies, a plurality of stationary contacts seated in recesses in one face of at least one body and arranged around the spindle and held in said recesses by the adjacent body, said stationary contacts each having a boss punched out of its surface and received in a complementary well in the contact receiving recesses to hold the contacts in the recesses, said bodies having adjacent faces recessed to provide a cavity therebetween, a collector ring in the cavity, a rotary contact member in the cavity comprising an insulating disc, a contact

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blade thereon, a resilient ring-shaped wiping contact connected with said blade and having portions bowed out of the original plane and held in resilient engagement with said collector ring by said adjacent body, and means to hold said bodies in assembled position.

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

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