

Aug. 28, 1956

D. G. KNIGHT ET AL
ROTARY ELECTRICAL SWITCHES

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Filed May 17, 1954

4 Sheets-Sheet 1

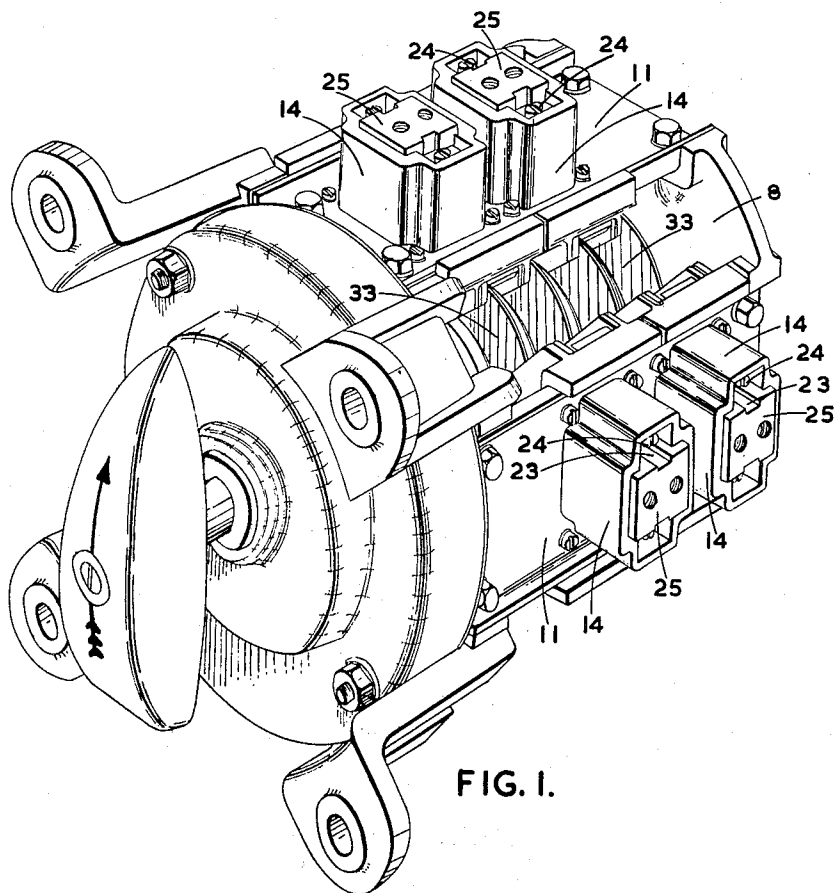


FIG. 1.

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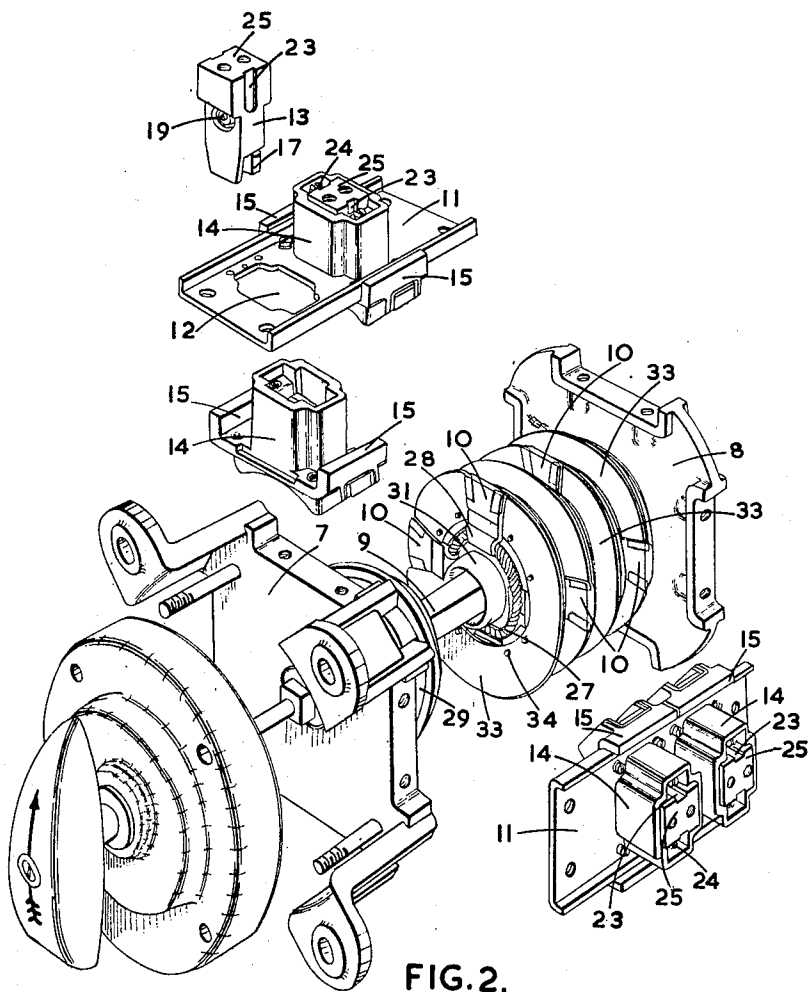


FIG. 2.

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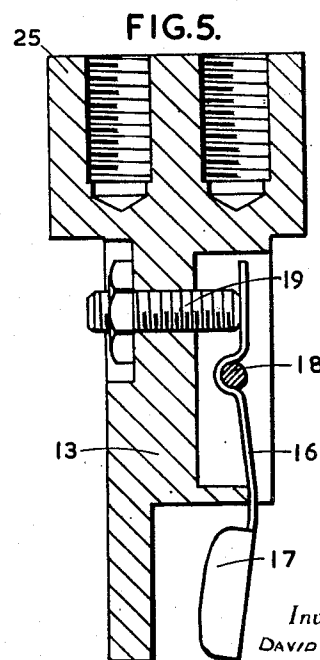
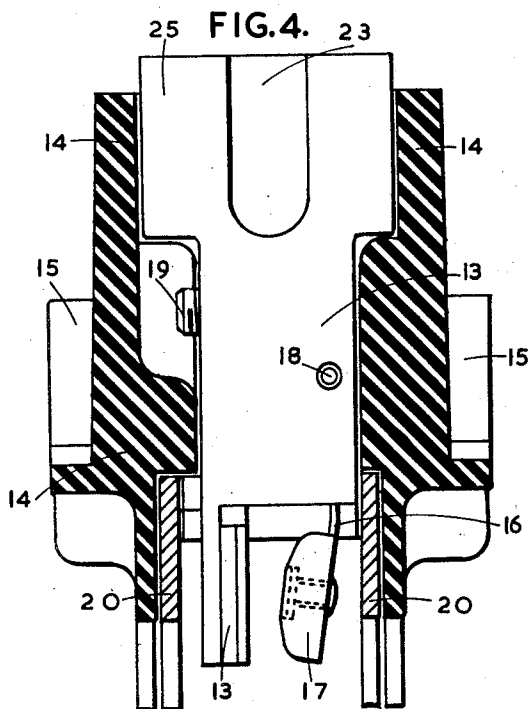
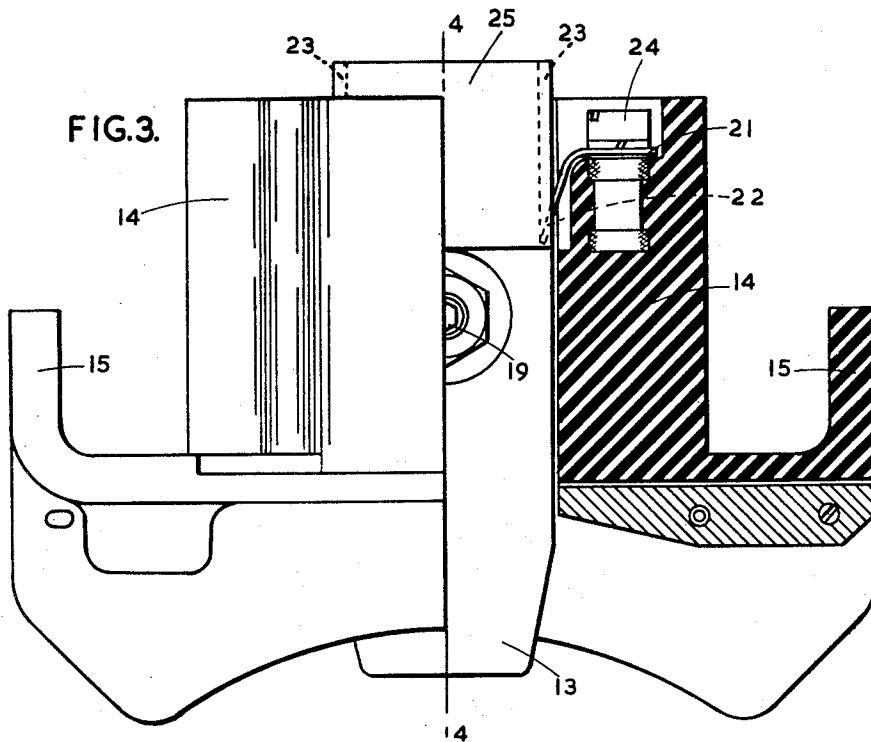
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ROTARY ELECTRICAL SWITCHES

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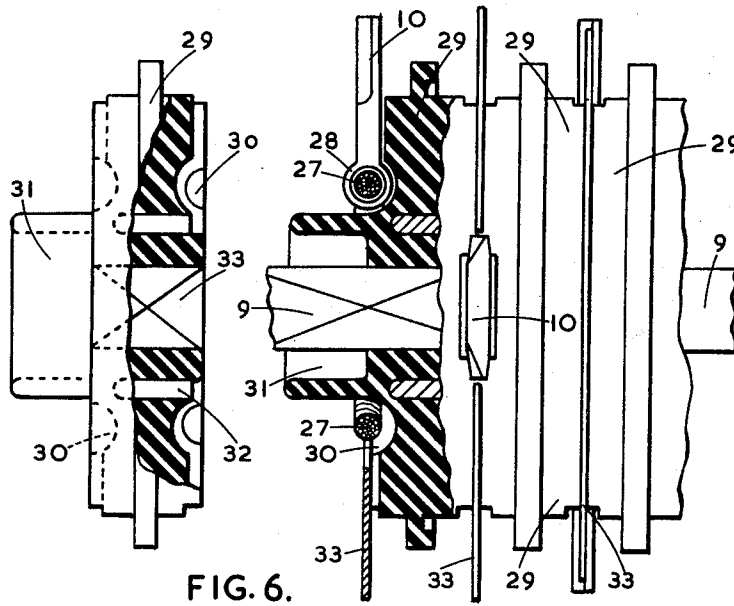


FIG. 6.

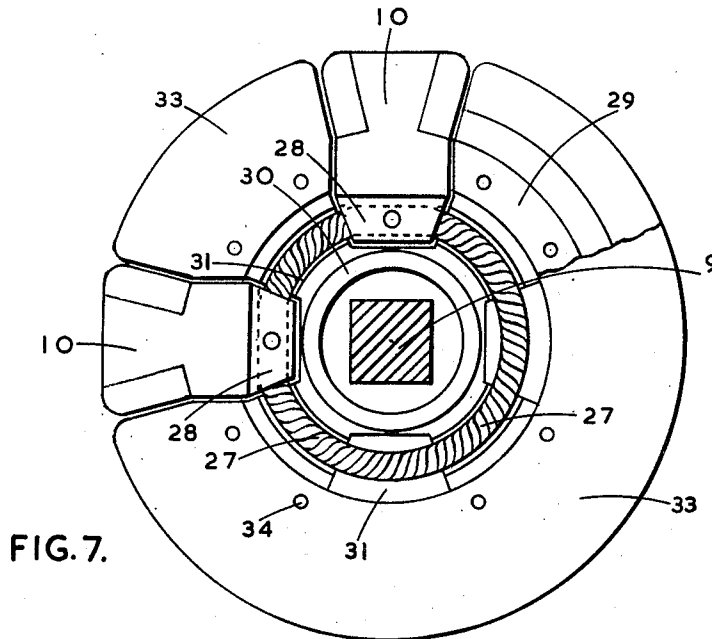


FIG. 7.

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ROTARY ELECTRICAL SWITCHES

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6 Claims. (Cl. 200—15)

This invention comprises improvements in or relating to rotary electric switches and has for its object to provide such a switch which is particularly adapted for heavy duty work and in which the fixed contact members are provided with pressure pads for ensuring good contact between same and the moving contact, which is self-aligning under all working conditions.

Referring to the accompanying drawings:

Figure 1 is a perspective view of a rotary electric switch embodying a number of fixed contact assemblies according to the present invention.

Figure 2 is a perspective view of the switch shown in Figure 1, with the fixed contact assemblies shown detached therefrom.

Figure 3 is an elevation partly in section of a fixed contact assembly.

Figure 4 is a section at 4—4 in Figure 3, the contact member being shown, however, in elevation.

Figure 5 is a section of the contact member only on the line 4—4 in Figure 3.

Figure 6 is an elevation partly in section of a plurality of rotary contact assemblies according to this invention mounted on a switch spindle, and

Figure 7 is a front elevation of part of a rotary contact assembly with part of an arc shield broken away.

In carrying the present invention into practice, as shown upon the accompanying drawings, one form of rotary electric switch comprises frame members 7 and 8 which are located at the two ends of the switch, said members 7, 8 carrying the operating spindle 9 on which the rotary contact members 10 are mounted, and which will be hereinafter more fully described.

The two frame members 7, 8 are connected together by four plate members 11 having a plurality of apertures 12 therein, in each of which is adapted to be removably mounted a fixed contact assembly.

Each of said assemblies comprise a tubular housing 14 of a synthetic resin, porcelain or other insulating material, which housing is substantially of a rectangular shape, said housing at its lower end having flanges 15 on oppositely disposed sides thereof which act as locating abutments when the housing is located in an aperture 12 in a plate member 11 to which it is secured.

Each housing 14 receives a fixed contact member 13 which extends beyond the lower end of the housing so as to be engaged by a rotary contact member 10.

Mounted on a leaf spring or the like 16 of the contact member 13 is an insulating contact pressure pad 17 which is located in alignment with the end of the fixed contact member 13 adjacent to that portion thereof with which the rotary contact 10 makes contact, the contact 10 moving between the contact 13 and the pad 17. The leaf spring member 16 pivots around a fulcrum 18 in a recess formed in the member 13 and the free end of said leaf spring 16 is adapted to engage the end of an adjusting screw 19 mounted in the fixed contact member 13, so that the pressure exerted by said contact pressure pad 17 is such as to retain the rotary contact member 10

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in good electrical contact with the fixed contact member 13. It is to be understood that the rotary contact 10 is non-rigidly mounted so that it may be moved by the pad 17.

Secured within the tubular member 14 adjacent to the pressure pad 17 and end of the fixed contact member 13 adjacent with the rotary contact member 10, are asbestos or like linings 20.

5 Anchors for securing the fixed contact members 13 in the tubular members 14, comprise L-shaped pressings 21 having a tongue portion 22 formed therein which is adapted to be located in the groove 23 formed in the sides of the fixed contact members 13. These anchors are secured in position by means of screws 24 which are adapted to screw into inserts located in the tubular members 14 so arranged that as the pressings 21 are screwed down into position, the ends of the tongue portions 22 bear against the bottoms of the grooves 23 and so retain the contact members 13 in position in the tubular mem- 10 bers 14.

Suitable connections are adapted to be connected to the ends 25 of the fixed contact members 13.

The rotary contacts 10 are mounted on a loop of stranded wire 27 which has mounted thereon one or more rotary contact members 10 which at their inner ends are provided with lugs 28 through which the stranded wire to form the loop 27 is threaded, the contact members 10 being secured to the stranded wire loop 27 by soldering, brazing or in any other suitable manner.

Where a plurality of contacts 10 are mounted on the same loop 27 they are so arranged in relation to one another as to simultaneously make contact with the co-operating fixed contact members 13, each loop 27 thereby serving to electrically connect the several contacts 13.

The ends of the contact members 13 are chamfered so as to provide an easy entry of said moving contacts 10 into contact with the fixed contact members 13.

Each moving contact member 10 as heretofore described is carried by a pair of insulating housing members 29 which retain the wire loop 27 and the inner part of the contact member 10 therebetween. The housing members 29 are recessed at 30 to loosely accommodate the loop 27 and the moving contacts 10, in such a manner as to permit sufficient movement of the contact members 10 to allow of self alignment when entering a fixed contact member 13, this movement being in a direction towards the right or left of Figure 6. Said housing members 29 are also provided with an extension 31 on one side thereof which is adapted to enter an annular recess 32 in the adjacent housing member 29 to interconnect the housing members together and form an adequate protection for the switch spindle 9.

The housing members 29 have a rectangular bore 33 which slides over the rectangular driving spindle 9 of the switch and thus provides a positive drive between the spindle 9 and the rotary contact members 13 and their housings 29.

The contact assemblies comprising the rotary contact members 10 and the housings 29 therefor are clamped together on the spindle 9 by any suitable means and are located between the two end members 7 and 8 of the switch.

Secured between adjacent housings 29 are arc shields 30 which are secured to the housings by pins 31 or in any other suitable manner, the shields being arcuate in shape to extend between the contacts 10 as shown in Figure 7.

What we claim is:

1. A rotary electric switch having in combination, a tubular insulating member for mounting in the switch framework, a fixed contact member located within said tubular insulating member, an insulated pressure pad piv-

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otally mounted on the fixed contact member and located opposite to the end of said fixed contact member, and a rotary contact member having a limited lateral movement mounted in a rotary housing rotatable with said rotary contact member, said rotary contact member making contact with the fixed contact member, the insulated pressure pad exerting lateral pressure thereon to ensure electrical contact between the fixed and rotary contacts.

2. A rotary electric switch having in combination, a tubular insulating member for mounting in the switch framework, a fixed contact member located within said tubular insulating member, an insulated pressure pad pivotally mounted on the switch contact member and located opposite to the end of said fixed contact member, a switch spindle, a rotary contact member mounted on said switch spindle comprising a loop of stranded wire, contact members mounted on said loop, rotary housing members mounted on said switch spindle in which said loop of stranded wire and rotary contact members are housed permitting lateral movement to said rotary contact members, the insulated pressure pad exerting lateral pressure thereon to ensure electrical contact between the fixed and rotary contacts.

3. A rotary electric switch having in combination a tubular insulating member for mounting in the switch framework, a fixed contact located within said tubular insulating member, a pivotally mounted leaf spring mounted in the fixed contact member, an insulating pressure pad mounted on said spring in alignment with the end of the fixed contact member, an adjustment carried by said fixed contact member for adjusting the tension applied to the insulated pressure pad to make contact with a rotary contact member and a rotary contact member having a limited lateral movement mounted in a rotary housing rotatable with said rotary contact member, said rotary contact member making contact with the fixed contact member, the insulated pressure pad exerting lateral pressure thereon to ensure an electrical contact between the fixed and rotary contacts.

4. A rotary electric switch having in combination a

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tubular insulating member for mounting in the switch framework, a fixed contact member located within said tubular insulating member, a pivotally mounted leaf spring mounted in the fixed contact member, an insulating pressure pad mounted on said spring in alignment with the end of the fixed contact member, an adjustment carried by said fixed contact member for adjusting the tension applied to the insulated pressure pad, a switch spindle, a rotary contact member mounted on said spindle comprising a loop of stranded wire, contact members mounted on said loop, rotary housing members mounted on said spindle in which said loop of stranded wire and rotary contact members are housed permitting lateral movement to said rotary contact members, the insulating pressure pad exerting lateral pressure thereon to ensure electrical contact between the fixed and rotary contacts and extensions on said rotary housings which interconnect with recesses in adjacent housings.

5. A rotary electric switch according to claim 4, wherein the fixed contact member is retained in the tubular member by an inverted L-shaped pressing, the one end of which is secured to the tubular member whilst the free end thereof exerts pressure on the lower end of a groove formed in the fixed contact member to retain same in position in the tubular member.

6. A rotary electric switch according to claim 5, wherein the rotary members comprise a housing, a wire loop mounted in said housing and contact members radially extending from said loop and passing through slots in said housing.

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