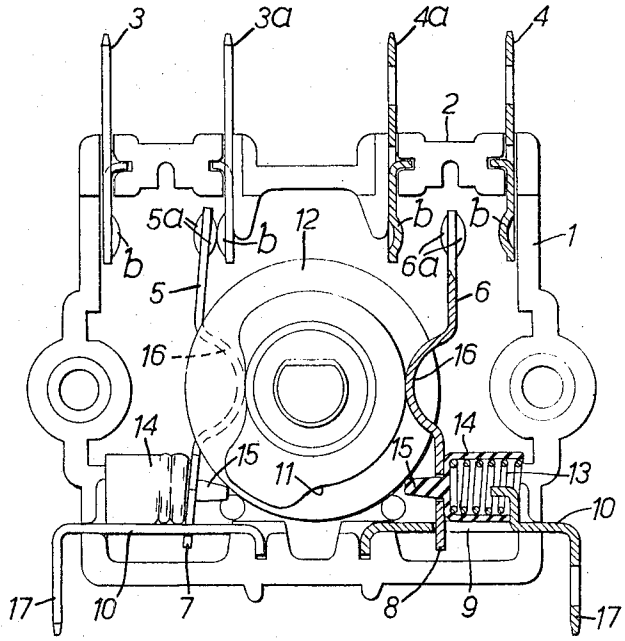
Jan. 17, 1967 C. W. HEATH 3,299,225

ROTARY SWITCH WITH IMPROVED CONTACT STRUCTURE AND CAMMING MEANS

Filed March 9, 1966



INVENTOR
CLARENCE WILLANS HEATH.
BY Philip E. Parker

ATTORNEY

United States Patent Office

3,299,225

Patented Jan. 17, 1967

3,299,225

ROTARY SWITCH WITH IMPROVED CONTACT STRUCTURE AND CAMMING MEANS

Clarence Willans Heath, Bleasby, England, assignor to United-Carr Incorporated, Boston, Mass., a corporation of Delaware

Filed Mar. 9, 1966, Ser. No. 532,997

Claims priority, application Great Britain, Mar. 31, 1965, 13,637

2 Claims. (Cl. 200—6)

This invention relates to a rotary switch comprising a movable contact arm adapted to be moved relative to a fixed contact by a rotor.

According to the present invention, a rotary electrical switch comprises a rotatable cam, at least one pivotally mounted contact carrying arm engageable by the cam so as to be displaced thereby into and out of engagement with a fixed contact, resilient means being provided engaging the arm adjacent to its pivot so as to resiliently urge the arm against the cam.

A pair of opposed fixed contacts may be provided, the contact on the movable arm being movable under the control of the cam into engagement with each of the fixed contacts or into an intermediate position out of engagement with both said contacts.

The cam may be adapted to engage an intermediate portion of the arm.

Preferably the resilient means comprises a spring engageable with the arm adjacent to its pivotally mounted end.

To enable the invention to be fully understood, it will now be described, by way of example, with reference to the accompanying drawing which schematically illustrates a rotary switch according to one embodiment of the invention.

As shown in the said drawing, the switch comprises a casing **1** and a cover **2** in which are mounted fixed contacts **3**, **3***a*, **4**, **4***a*, the portions of the contacts projecting into the casing being provided with contact pips *b*. As shown, the pips *b* of the contacts **3**, **3***a* as also those of the contacts **4**, **4***a*, are in opposed facing relation.

Movable contact arms **5**, **6** are provided having double faced contact pips **5***a*, **6***a* at one end. At the opposite end the respective arms are formed with lugs **7**, **8**, pivotally supported in slots **9** in contact members **10**. Each of the contact arms is provided with resilient means urging it towards the cam surface **11** of a rotor **12**. As shown, each resilient means comprises a coil spring **13** housed in a shroud **14** of rubber or other flexible insulating material and formed with a projection **15** at one end extending into an aperture in the respective contact arms adjacent to the pivotal mounting thereon. The springs **13** normally tend to extend the shrouds so as resiliently to urge the contact arms towards the cam surface **11** so that the arcuately bent portions **16** of the respective arms are maintained in contact with the cam surface **11** as the rotor rotates.

The contact members **10** are formed with tailpieces **17** projecting outwardly of the switch casing for connection to lead wires to complete a circuit to the respective arms

5 and **6**. It will be noted that the shrouds **14** insulate the contact arms from the springs **13**.

The fixed contacts **3**, **3***a*, **4**, **4***a* are also adapted to be attached to lead wires, and accordingly during the rotation of the rotor **12**, when the high portions of the cam **11** engages the portions **16** of the arms **5** and **6** respectively, they will be displaced against the action of their respective springs **13** into engagement with the fixed contacts **3**, and **4**. When the recessed or low portion of the cam is aligned with the portion **16**, the arms will be positioned in engagement with the fixed contacts **3***a*, **4***a*, and when the portion of the cam intermediate the high and recessed portion is aligned with the bent portion **15**, the contact arms will be in an intermediate position out of engagement with both the fixed contacts.

The springs **13** not only serve to urge the arms into resilient engagement with the cam surface **11** of the rotor, but also serve to absorb any pressure exerted on the contact arms in excess of that necessary to effect the efficient electrical engagement of the pips of the arms **5**, **6** with the pips of the fixed contacts.

It will be understood that if the pressure is excessive, there would be a tendency for the contact arms **5** and **6** to be overstressed mechanically so as to cause them to break or assume a "set" which will impair the efficient operation of the switch.

While the switch illustrated and described is provided with two movable contacts each engageable with two fixed contacts, it will be understood that the switch may include one, or more than two movable contacts, each engageable with a single or a pair of contacts.

I claim:

1. A rotary electrical switch comprising a rotatable cam, mounted in a casing, at least one contact arm pivotally mounted, at one end, in said casing, the opposite end being provided with an electrical contact for engagement with a fixed contact, said contact arm engageable by said cam so as to be displaceable thereby to position said electrical contact into and out of engagement with said fixed electrical contact, spring means enclosed in a flexible housing of insulating material provided adjacent the pivot end of said arm to urge an intermediate portion of said arm into engagement with said cam, the action of said spring means being transmitted through said housing to said arm.

2. A rotary electrical switch as set forth in claim **1** wherein said contact arm has an aperture formed therethrough in close proximity to said pivotal end and said spring means has means engaged in said aperture formed in said contact arm.

References Cited by the Examiner

UNITED STATES PATENTS

2,262,306	11/1941	Thompson	200—6
2,832,851	4/1958	Jones	200—6
3,241,381	3/1966	Kuhn et al.	74—97

ROBERT K. SCHAEFER, *Primary Examiner.*

J. SCOTT, *Assistant Examiner.*