April 8, 1947. F. C. WALLACE 2,418,564

SWITCH

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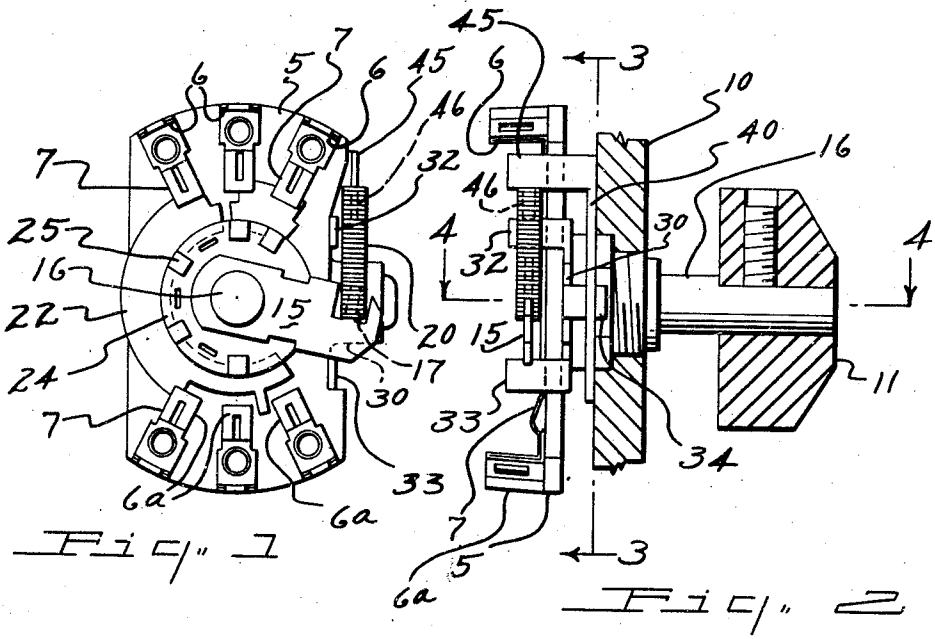


Fig. 1

Fig. 2

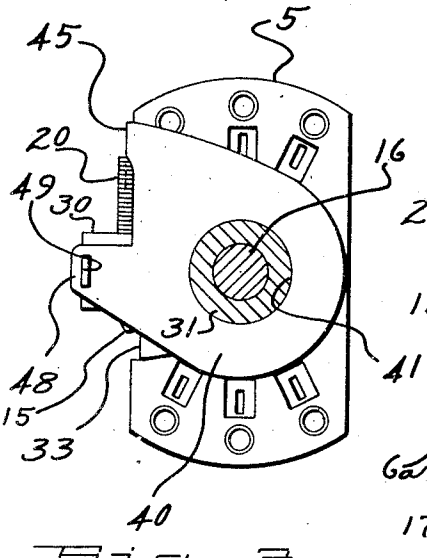


Fig. 3

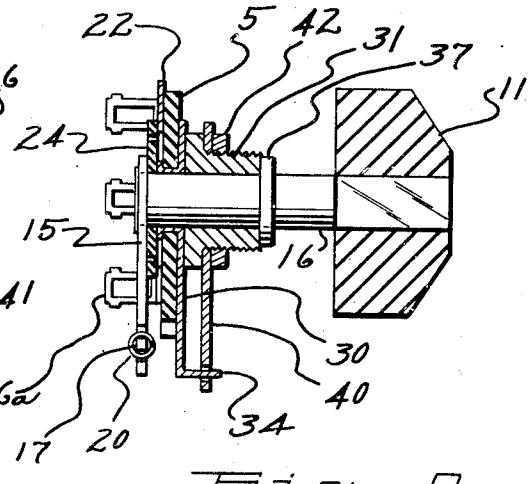


Fig. 4

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SWITCH

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3 Claims. (Cl. 200—6)

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My invention has to do with improvements in electrical switches.

In the construction and use of switches in certain types of apparatus, such as inter-communicating systems and the like, considerable difficulty has been experienced in providing a return spring for the switch arm which is strong enough and which will not be subject to too rapid crystallization. This difficulty arises chiefly because, due to the small space which can be provided for the switch, the switch must be extremely small and its component parts must be correspondingly small.

It is the primary object of my present invention to overcome those difficulties and to provide in such a switch a strong and durable arm-actuating spring which does not require frequent replacement.

It is also an object to provide in such a switch an arm actuated by a compression spring which may be readily applied and removed without disturbing the other parts of the switch.

A further object is the provision of a spring mounting for such switches which may be readily installed in a conventional switch as a substitute for the objectionable type of spring actuation.

To explain my invention I shall describe one of its adaptations, although, within its broader purview, the invention is not intended to be limited to the precise details of construction now to be described.

For purposes of the following explanation I shall refer to the accompanying drawings, in which:

Fig. 1 is a front elevational view;

Fig. 2 is a side elevation with some parts shown in section;

Fig. 3 is a view taken on line 3—3 of Fig. 2; and

Fig. 4 is a section taken on line 4—4 of Fig. 2.

In the drawing I show at 5 a plate made of any suitable insulating material and carrying wire terminals 6, 6a, each of which has a resilient contact element 7. The plate is adapted to be mounted on a wall 10, such as the wall of a cabinet.

An operating shaft 16 is journaled in a bearing 31 and is adapted to extend through the wall 10 and carry an operating knob 11 on its outer end. The shaft extends through the plate 5 and an arm 15 is secured on the opposite end of the shaft, the arm being provided with a recess in its top surface. A finger or lug 17 formed integral

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with the arm, projects into the recess to receive one end of a compression spring 20.

To open and close the circuits between the contacts 6, 6a upon rotation of the shaft 16, there is a contact element 22 which is secured by ears 25 to an insulating disc 24, the disc being secured on the shaft. As shown in dotted lines in Fig. 1, the contact element 22 is in two sections insulated from each other by the disc 24.

A retaining plate 30 is mounted between the enlarged diameter part of the bearing 31 and plate 5, being provided with spaced ears 32, 33 which limit the up-and-down swinging movement of arm 15, the plate being provided also with a lug 34 which projects into the wall 10 to positively hold the plate 5 against rotation. A flanged portion of plate 30 is secured in an opening in plate 5 and serves as a bearing for shaft 16.

A split retaining ring 37 which fits in an annular recess in the shaft 16 prevents longitudinal movement of the shaft relative to the plate 5 and its carried parts.

Up to this point I have described what more or less is conventional construction of a switch of the type employed in inter-communication systems, the switch being shown in position closing the transmitting circuit, which normally is resiliently maintained in closed condition. In such apparatus it is desirable to momentarily open the transmitting circuit and close the receiving circuit by means of rotating the knob 11 clockwise, after which the parts automatically return to the transmitting circuit closing and transmitting circuit opening position under the influence of a spring. Heretofore it has been deemed necessary to employ a relatively long tension spring to accomplish this automatic return, which type of spring when used in a switch of the described construction not only interferes with mounting and operation of the switch, but also rapidly crystallizes so that the entire switch must be removed from the apparatus for replacement of the spring.

I overcome this difficulty and provide a mounting which permits the utilization of a small compression spring and one of the embodiments by which I accomplish this result will now be described.

I provide a plate 40 which has an opening 41 so that it fits over the bearing 31 and may be held thereon by a nut 42 threaded onto the threaded exterior of the threaded bearing.

At the top left-hand end of the plate 40 (as viewed in Fig. 3) I provide an ear 45 having a depending lug 46, the ear 45 being bent at sub-

stantially right angles to the body of the plate **40** so that it is disposed at the side of the plate **5**, projecting beyond the plane of the front surface of the latter plate. At a point below the ear **45**, the plate is provided with a projection **48** which has a transverse hole **49** to pass the lug **34**, so that the plate **40** is positively held against rotation on the bearing **31**. I mount the compression spring **20** by inserting the depending lug **46** in one end of the spring and inserting the upstanding lug **17** in the opposite end of the spring, the latter lug being formed integral with the arm **15**. In this position the spring may not accidentally escape and may be readily installed and removed without dismantling the switch. Moreover such a spring mounting may be installed on any existing switch.

I claim:

1. In a switch having a body carrying a stationary contact element, a rotatable shaft carrying a movable contact element and a shaft-actuating arm presenting a spring mount, a plate carried by the body, said plate being mounted for separation from the body and having an angular portion presenting a lug and a compression spring having one of its ends fitting over said lug and its other end engaging said spring mount whereby to yieldably oppose movement of the arm towards said spring-anchoring member.

2. In a switch having a body carrying a stationary contact element, a rotatable shaft carrying a movable contact element and a shaft-actuating arm presenting a spring mount, a plate mounted against the body, means for retaining the plate against movement relative to the body, said plate being mounted for separation from the body and presenting a lug, and a compression spring having one of its ends fitting over said lug and its other end engaging said spring mount whereby to yieldably oppose movement of the arm towards said lug.

3. A switch comprising a wall plate having an opening therethrough, an operating shaft rotatably extending through the opening, stationary contact elements carried by the plate, movable contact elements carried by the front end portion of the shaft, an actuating arm secured to the front end of the shaft and projecting radially therefrom, said arm presenting a laterally projecting lug, a spring mounting plate having a bearing-receiving opening and disposed parallel to and rearwardly of the wall plate, said spring mounting plate being mounted for separation from the body and having an angular arm portion disposed beside and projecting beyond the plane of the front surface of the wall plate, a depending lug on the spring mounting plate, means securing the latter plate against rotation relative to the wall plate, and a compression spring having its respective ends fitting over said respective lugs whereby to yieldably oppose movement of the arm towards the depending lug.

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