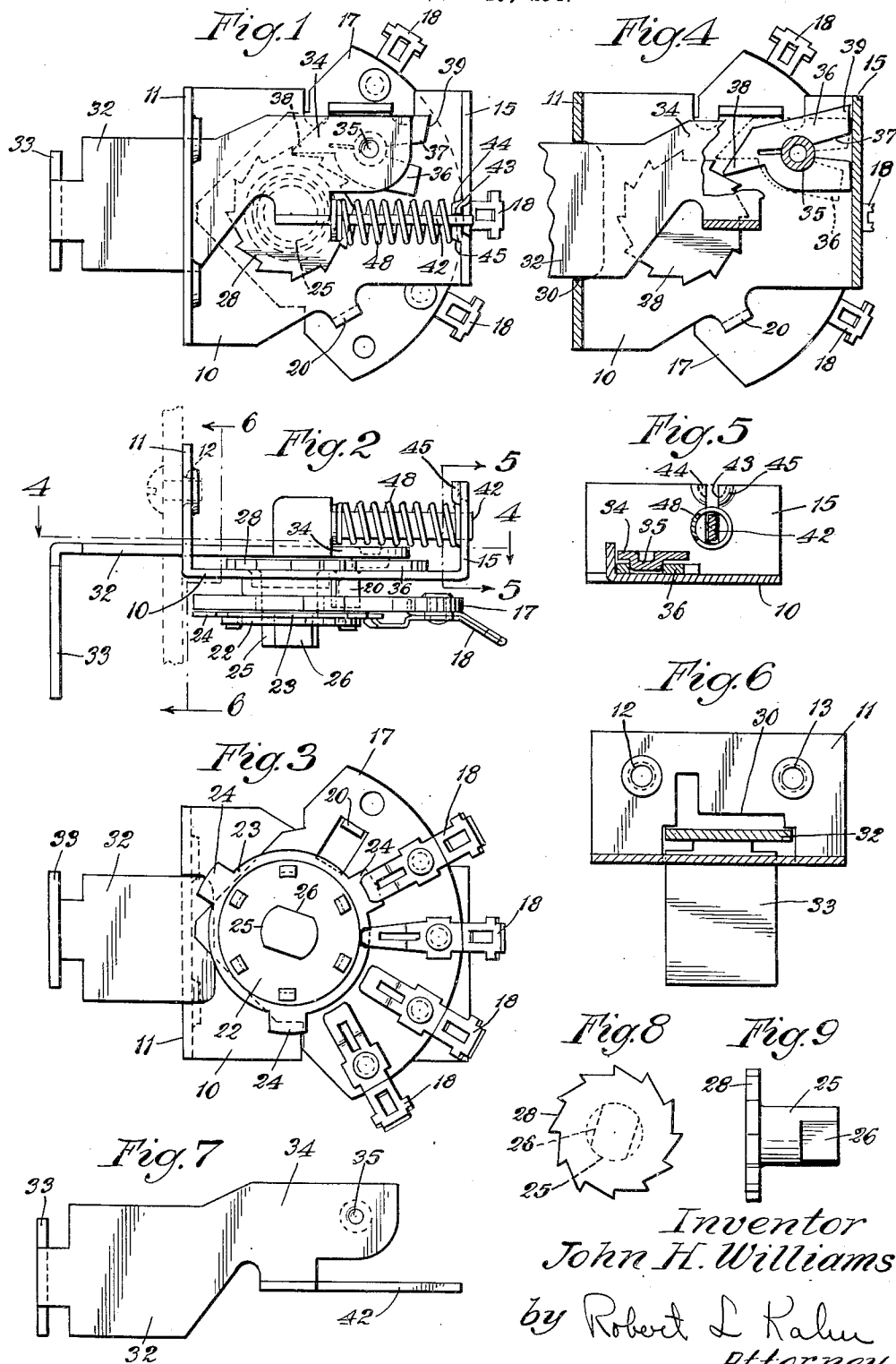


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ELECTRICAL APPARATUS

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ELECTRICAL APPARATUS

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4 Claims. (Cl. 200—6)

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This invention relates to an electrical apparatus and particularly to a rotary switch. This invention is particularly concerned with a rotary switch of the type having push button means for actuating the switch. Switches of this type generally provide a pawl and ratchet means whereby the switch may be advanced one step at a time in response to push button actuation. Where a switch provides a relatively light load, it has been found that conventional pawl and ratchet means are unsatisfactory. Thus a switch having a movable element which operates rather easily may be moved back and forth rather than be advanced.

A construction embodying the present invention provides a pawl and ratchet means for use with a switch whereby positive advance of the switch rotor is secured for each movement of the pawl. In order that the invention may be understood, a detailed description thereof in connection with the drawings will now be given.

Referring to the drawings, Figure 1 is a plan view of a switch embodying the present invention. Figure 2 is an elevation of the switch shown in Figure 1. Figure 3 is a plan view showing the other side of the switch of Figure 1. Figure 4 is a sectional view on line 4—4 of Figure 2 but showing the pawl in a retracted position. Figure 5 is a sectional detail on line 5—5 of Figure 2. Figure 6 is a sectional view on broken line 6—6 of Figure 2. Figure 7 is a detail of the movable part of the mechanism. Figures 8 and 9 are end and side views respectively of the ratchet wheel.

The switch comprises base plate 10 of sheet metal or the like having mounting flange 11 provided with suitable mounting apertures 12 and 13 for securing the same on a support. Base plate 10 has upstanding portion 15.

Rigidly attached to base plate 10 is stator plate 17 of a switch. Plate 17 may be of insulating material such as Bakelite or fibre and has stationary contacts 18 secured thereto at spaced intervals. Stator plate 17 may be attached to base plate 10 in any suitable manner such as by ears 20 extending from base plate 10 through the stator plate. Stator plate 17 has a circular portion cut out therefrom in which is disposed rotor 22 of suitable insulating material. Rotor 22 carries movable contact 23 consisting of an annular flat member having contact projections 24 at spaced intervals. This type switch is more fully described and claimed in Patents 2,186,949 and 2,186,950 issued on January 16, 1940.

In order to actuate rotor 22, stub shaft 25 is provided. Shaft 25 has non-circular end 26

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engaging a correspondingly shaped aperture in rotor 22 whereby the rotor may be turned with the shaft. Shaft 25 carries ratchet wheel 28 at one end thereof. Ratchet wheel 28 may have as many teeth as desired and in practice will have adjacent teeth forming an angle therebetween equal to the angle through which the rotor must be moved for one switch movement.

Base plate 10 has a portion cut out at 30 for accommodating part 32 of a movable member. Part 32 may be formed of sheet steel and has finger piece 33. Part 32 extends through cut-out 30 and has portion 34 overlying ratchet wheel 28. Portion 34 carries pivot pin 35 upon which is loosely secured pawl 36. Pawl 36 has cut-out 37 so that it may be sprung over pin 35. Pawl 36 has tooth 38 and end 39. As seen in Figures 1 and 4, the pawl has the end and tooth so shaped, that when tooth 38 engages the ratchet as seen in Figure 1, end 39 forms an acute angle with upstanding portion 15 of the base plate. When the pawl is in a retracted position as seen in Figure 4, rear portion 39 of the pawl engages upstanding portion 15 and moves the pawl about this pivot into position to engage a new tooth.

Portion 34 carries finger 42 extending along the line of movement of member 32. Finger 42 passes through slot 43 formed in upstanding portion 15 of the base plate. The material of the base plate at the upper portion of slot 43 is mutilated or built up to provide retaining ears 44 and 45. As is evident from Figures 1 and 2, finger 42 at all times extends through slot 43 beyond upstanding portion 15 of the base plate. Spring 48 is disposed around finger 42 between the body of member 32 and upstanding portion 15. Spring 48 has the end coil fitting snugly below ears 44 and 45 and thus tends to lock finger 42 in position.

In order to assemble the entire device, the rotor and stator of the switch are assembled in the usual manner, this being more fully described and claimed in the patent previously referred to. Thereupon ratchet 28 is disposed in position with the shaft passing through the switch rotor. Member 32 is threaded through cut-out 30 and has the pawl disposed in proper position. Finger 42 now rests above slot 43. Spring 48 is compressed to clear ears 44 and 45 and finger 42 now drops into slot 43. Thereupon spring 48 is released and this locks the entire switch assembly.

Operation of the switch is obtained by pushing finger piece 33 toward the right as seen in Figures 1 to 3 inclusive. In the normal position of the switch as shown in Figures 1 to 3 inclusive, the

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pawl engages a tooth of the ratchet. When the finger piece is pressed to the right, the pawl is moved so that the tooth slides along the ratchet tooth. When the member is in the position shown in Figure 4, the pawl is moved around its pivot from the dotted line position to the full line position. Thereafter when the finger piece is released the tooth of the pawl engages a new ratchet tooth and moves the switch rotor counter-clockwise as seen in Figures 1 and 4.

What is claimed is:

1. A rotary switch comprising a base having an upturned portion at one end thereof, a stator and rotor mounted on said base, switch contacts carried by said stator and rotor respectively for cooperation during switching action, a ratchet wheel secured to said rotor for moving the same, a member mounted on said base for movement in a straight line and having a finger extending from an end thereof, said upstanding base portion having a slot extending to the edge thereof through which said finger passes, a spring mounted around said finger and extending between said member and upstanding base portion for biasing said member to one end position, a pawl pivotally mounted on said member for cooperation with said ratchet wheel, said pawl being in a ratchet engaging position when said member is in its one position, said pawl having a face shaped to cooperate with said upstanding portion and adapted to contact said upstanding portion when said member has been moved to its other position, said upstanding portion causing said pawl to move on its pivot so that the pawl tooth may engage a new ratchet wheel tooth.

2. The structure according to claim 1 wherein said upstanding portion has projections at the part adjacent the end of the slot and on the side facing the member whereby said spring is adapted to lock under said projections for maintaining the entire assembly intact.

3. A rotary switch comprising a base having

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an upstanding portion provided with a slot extending to the edge of said upstanding portion, said base having a cut-out at a portion thereof, a switch stator and rotor mounted on said base, a ratchet wheel secured to said rotor for moving the same, a member threaded through said cut-out and lying on said base and having a finger extending through said slot, said member being movable in a straight line along said base, a spring around said finger between said upstanding portion and the body of said member for biasing said member to one end position, projections at said upstanding portion at the side facing the member and disposed on opposite sides of the slot adjacent the free edge of the upstanding portion and adapted to lock the end coils of the spring between projections and base, a ratchet wheel secured to said rotor for moving the same, a pawl pivotally mounted on said member for cooperation with said ratchet wheel and adapted to engage a ratchet tooth when said member is in its one position, said pawl having a face opposite the tooth engaging portion of the pawl shaped to cooperate with said upstanding portion when said member is in its other position for moving said pawl around the pivot to engage a new ratchet tooth.

4. The structure according to claim 3 wherein said pawl is slotted to permit springing over a pivot pin.

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REFERENCES CITED

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

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