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ADJUSTABLE MULTIPLE SWITCH MECHANISM

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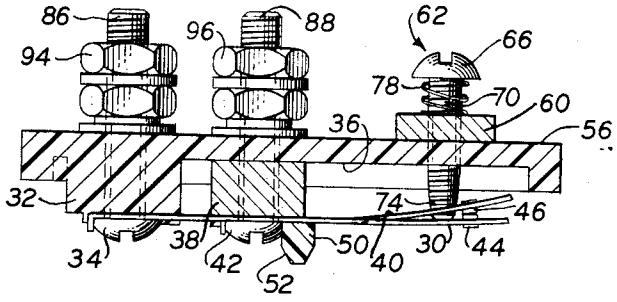


Fig.3

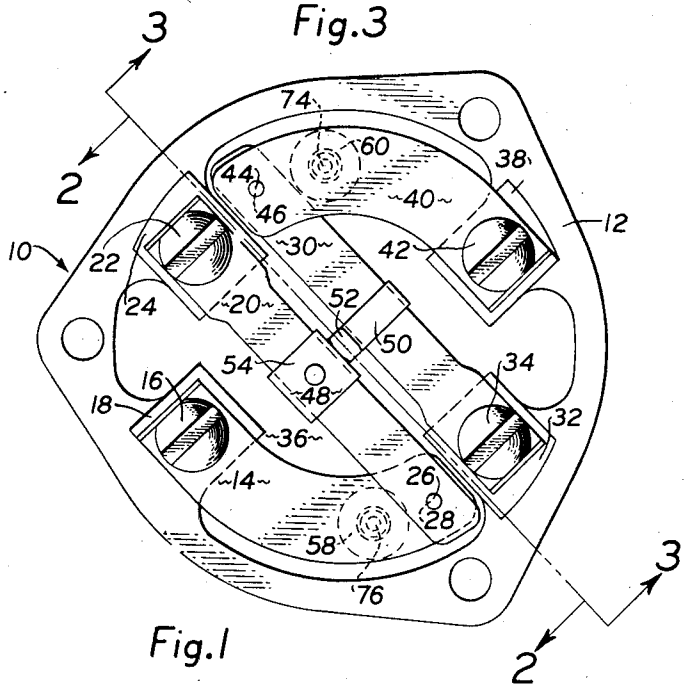


Fig.1

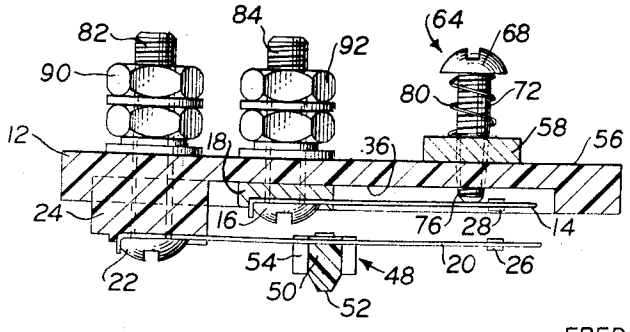


Fig.2

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ADJUSTABLE MULTIPLE SWITCH MECHANISM

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This invention relates to adjustable switch mechanism and more particularly to a novel sequentially operated switch means to be used in electrically operated apparatus.

The invention as such is best utilized in current operated units wherein there is a necessity of having switch means adaptable to be sequentially controlled.

The principal object of this invention is to provide a mechanism as above stated which is economical in design and can efficiently perform the specific functions necessary in fulfilling multiple switch requirements.

Further objects and advantages of this invention will appear from the following description taken in connection with the drawings forming a part of the specification, and in which;

Figure 1 is a top view of the adjustable multiple switch mechanism.

Figure 2 is a projected view of the mechanism taken in cross-section along line 2—2 of Figure 1.

Figure 3 is a projected view of the mechanism taken in cross-section along line 3—3 of Figure 1.

Briefly, the invention comprises a base member of insulator material or the like wherein a recessed portion and several projections are formed. The recessed portion provides adequate clearance between several movable contact arms of the switch mechanism and the base member. The projections support the switch arms and provide bolt mounting means to secure the switch arms to the base member. The securing means are provided with a nut and washer arrangement adaptable to secure switch lead in wires. The unsupported ends of the switch arms are provided with contact points adaptable to engage one another upon actuation of the switch mechanism.

Similarly disposed in the base member are adjusting means adaptable to lower or raise the contact point of the switch arms to effect sequential adjustment of the switches. Secured to one of the switch arms is a pad member adaptable to receive an actuating means and transmit a force to the switch arms.

Referring to the drawings for more specific details of the invention, the novel adjustable switch mechanism **10** comprises a principally flat insulated material base member **12** wherein a recessed portion and projections are formed therein varying from the basic thickness of the base member **12**.

The switch mechanism comprises multiple contact arms secured to the base member **12** in the following manner. Arm **14** is secured by a bolt means **16** to projection **18** formed integral with or attached to the base member **12**. Arm **14** extends in a plane substantially parallel to the base member.

Switch arm **20** is secured by a bolt **22**, in a similar manner as arm **14**, to a projection **24** adjacent a recessed portion **36** of the base member and substantially adjacent to projection **18**. Switch arm **20** extends in a plane substantially parallel to the plane of the base member with the remote end of the arm, extending from the secured

portion, provided with a contact point **26** adaptable to be engaged by a contact point **28** similarly formed on the remote end portion of switch arm **14**.

A switch arm **30** substantially identical to arm **20** is disposed substantially parallel to switch arm **20** and is secured to a projection **32**, extending from base member **12**, by a bolt **34**. A projection **38** oppositely disposed from projection **18** adjacent the recessed portion **36**, of the base member **12**, has an arm **40** secured thereto, with arm **40** disposed substantially opposite to arm **14** and secured in a manner as arm **14**. Switch arm **40** similarly extends in a plane parallel to the plane of the base member and has its outer peripheral edge curving in an arcuate manner similar to the outer peripheral edge of the recessed portion of the base member. Provided at the end of arm **40** remote from the secured portion thereof by a bolt means **42**, is a contact point **44** arranged so as to be engageable by a contact point **46** formed on the free end of switch arm **30**.

The pairs of switch arms, **14** and **20**, **30** and **40**, are made of resilient electrical current conductive sheet metal, the purpose of which will hereinafter appear.

Secured to previously described arm **20** is a pad member **48** having a lateral arm portion **50** which extends perpendicular to arm **20** as to overlap switch arm **30** and adapted to be engageable therewith upon actuation. Lateral arm portion **50** of pad member **48** has a projection **52** thereon extending in a direction normal to the plane of the base member **12**. Projection **52** is so arranged centrally of the switch mechanism and is adapted to be engaged by an actuating means from which the force applied thereto can be transmitted to end portion **50** or to central portion **54**. Figures 2 and 3 best illustrate the projection **52** extending from end portion **50** of pad member **48** indicating the direction of the extension.

Figures 2 and 3 further illustrate the location of projections **18**, **24**, **32** and **38** and the recessed portion **36**. Extending from a bottom portion **56** of the base member **12** are projections **58** and **60** which serve to house adjusting means or screws **62** and **64**. The adjusting screw means as shown project through the base member and open out through the recessed portion **36**. Adjusting screw means **62** and **64** are provided with slotted head portions **66** and **68** and shank portions **70** and **72**, respectively. End portions **74** and **76** of the adjusting means **62** and **64**, respectively, are adaptable to engage switch arms **14** and **40**, respectively. Disposed intermediate the head portions **66** and **68** of the adjustable means **62** and **64** and the surface of the respective projections **58** and **60** are resilient members or coil springs **78** and **80** which serve to maintain the adjusting means in a slack free position. Similarly illustrated in Figures 2 and 3 are the extended portions **82** and **84** of securing means **22** and **16**, respectively, as shown in Figure 2 and extended portions **86** and **88** of securing means **34** and **42**, respectively, as illustrated in Figure 3. Secured to said extended portions **86** and **88**, and **82** and **84** are holding means **90**, **92**, **94** and **96** comprising dual nuts and washers disposed intermediate thereof. The holding means being adjustable to vary the axial distance along the stem portions of the securing means between the nut and washer and is adaptable to receive and maintain current carrying lead wires.

The function of the adjusting means as described above is primarily to vary the sequential operation of the switch mechanism.

The mechanism operates in the following manner: An actuating force is applied to the pad member **48**. The applied force is transmitted from the pad member to the arms **20** and **30** which react according to the setting of the adjusting screws. The adjusting means can be set in a manner as to sequentially engage and disengage the

contact points of the switch arms at a desired time variable. In the illustrations shown, the adjusting means are preset as to react when the force is applied to the pad member in a manner to disengage contact points 46 and 44 from switch arms 40 and 30, respectively, and after a predetermined time interval engage contact points 26 and 28 on switch arms 20 and 14, respectively.

Further modifications of the described invention can be made by additional resettings of the adjusting screws to the desired contacting sequence obtainable within the capacity of the switch mechanism. The pad member 48 receives an actuating force directing the engaging and disengaging of the contact points on the switch arms. Adjusting screws 62 and 64, by their resetting, can vary the switching sequence as follows. Adjusting screw 62 can be set as to provide contact between switch arms 30 and 40 whereby actuation of the pad member will maintain engagement between switch arms 30 and 40 and produce an engagement between arms 14 and 20. Adjustment screw 62 can be further set to maintain switch arms 30 and 40 in disengagement prior to pad actuation. With the aforesaid adjustment upon pad actuation, switch arms 30 and 40 remain disengaged and switch arms 14 and 20 can become engaged.

Adjustment screw 64 can be preset as to maintain switch arms 14 and 20 in engagement prior to pad actuation. With this setting of screw 64 and adjustment screw 62 positioned to maintain switch arms 30 and 40 in engagement as shown in Figure 3, actuation of the pad member results in switch arms 14 and 20 remaining engaged while switch arms 30 and 40 become disengaged.

As can be seen from the illustrations and the above description, the mechanism is simple in operation and construction, yet this simplicity does not detract from the novelty and usefulness of the mechanism. While this invention has been described in connection with certain specific embodiments the mechanism involved is susceptible to numerous other applications that will readily occur to men skilled in the art. Therefore, the invention is limited only as indicated by the scope of the appended claims.

What I claim is:

1. A multiple switch mechanism comprising dual contact switch means each including a pair of elongated resilient arms, one arm of each pair being substantially straight and the other arm thereof being generally arcuate, means for supporting adjacent end portions of each pair of arms to a support member with the respective other end portions thereof being movable into and out of engagement with each other, a contact defined by the other end portion of each arm, said one arms extending from the respective supporting means in opposite directions relative to each other, and means extending between the intermediate portions of said one arms to enable common actuation of the dual contact switch means.

2. A multiple switch mechanism comprising dual contact switch means each including a pair of elongated resilient arms, one arm of each pair being substantially straight and the other arm thereof being generally arcuate, means for supporting adjacent end portions of each pair of arms to a support member with the respective other end portions thereof being movable into and out of engagement with each other, a contact carried by the other end portion of each arm, said one arms being disposed substantially parallel and extending from the respective supporting means toward each other, means extending between the intermediate portions of said one arms to enable common actuation of the dual contact switch means, and means for independently adjusting the position of the other end portions of the arms to enable sequential operation of the dual contact switch means in desired time intervals.

3. A multiple switch mechanism comprising dual contact switch means, each of said switch means including a pair of elongated resilient arms, one arm of each pair being substantially straight and the other arm thereof being generally arcuate, means for supporting adjacent end portions of each pair of arms to a support member with the respective other end portions thereof being movable into and out of engagement with each other, a contact carried by the other end portion of each arm, said one arms being disposed substantially parallel and extending from the respective supporting means in opposite directions toward each other, a pad member mounted on one of said arms having a laterally extending portion selectively abuttable with the other said one arm to enable conjoint operation of the dual contact switch means, and adjustable means engageable with each of the other arms to independently control the other arms to enable sequential engagement of the respective contacts in preselected time intervals.

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