Nov. 8, 1938. E. MICHEL 2,136,307

COMBINATION SWITCH MECHANISM

Original Filed Sept. 16, 1935

Fig. 1.

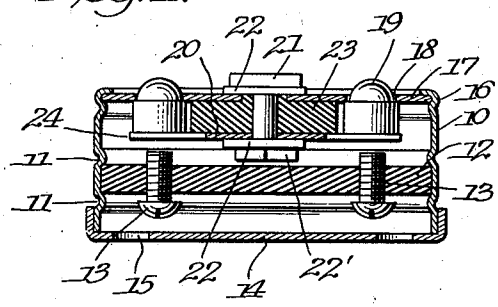
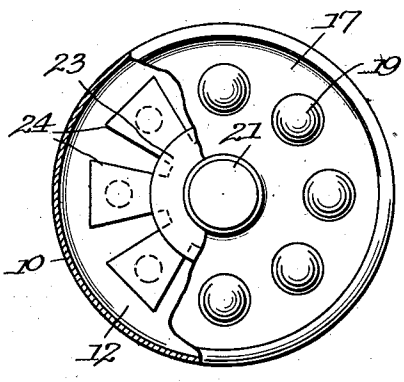


Fig. 2.



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COMBINATION SWITCH MECHANISM

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Original application September 16, 1935, Serial No. 40,844, now Patent No. 2,082,806, dated June 8, 1937. Divided and this application March 10, 1936, Serial No. 68,124

5 Claims. (Cl. 200—43)

The present invention relates to an improved electric combination switch mechanism and is a division of my copending application Serial No. 40,844, filed September 16, 1935.

Heretofore in switches of the type to which the present invention pertains, the contact arms or fingers have been usually curved or bent so as to engage yieldably the push buttons. When these contacts are subjected to constant usage or pressure, their resiliency gradually diminishes with the result that the efficiency of the switch is seriously impaired.

An object of the present invention is to overcome the defects of such a switch and this is effected by interposing, between the fixed contacts and the push buttons, a substantially flat member or disc having radiating from the center thereof spaced, resilient, flat arms which normally are disposed in the same plane as the disc and in substantial parallelism with the opposed surfaces of the fixed contacts and the push buttons. Consequently, when one of the arms is deflected by a push button and brought into engagement with its aligned fixed contact, it will, upon release of the push button, automatically return to its normal horizontal position and will not depend upon its resiliency to insure proper and uniform engagement with its associated push button.

A further object consists in providing a casing or panel which houses the contacts, with a movable cover or face plate to which the movable contacts and push buttons are connected so that, upon rotation of the cover plate, the movable contacts and push buttons may be selectively moved into registration with the fixed contacts, thus providing means, when a push button or plate shows evidence of wear or other marks which might betray the combination, for turning the cover plate to substitute other push buttons in place of the used push buttons without changing the combination of the circuit or the moving of the fixed contacts.

Another object of the invention comprehends the provision of a simple, efficient and durable switch mechanism in which the movable contacts are associated with the fixed contacts in such a manner that any one of the movable contacts may be moved selectively so as to engage any one of the fixed contacts to close a predetermined circuit, and in which several operable members may be conveniently actuated from a single switch mechanism.

A further object is to provide a dual control electric combination switch in which two electric combination switches are used in combination to operate one or more devices and thus make it more difficult for an unauthorized party to guess or obtain the proper combination necessary to operate the switch. Additionally, means may be associated with the dual control switch which requires the presence or consent of at least two different persons to operate the same.

Other objects and advantages of the invention will become apparent from the following description taken in conjunction with the following claims and drawing.

Referring to the drawing, in which are shown preferred embodiments of the invention,

Figure 1 is a transverse sectional view of my improved switch;

Figure 2 is a plan view of Figure 1 with parts cut away for clearness of illustration.

Referring to the drawing in which like numerals indicate like parts throughout the several views, 10 designates a casing or panel in which is housed the operative parts of the switch. The casing may be of any suitable size and shape and is shown as cylindrical. The wall of the casing is preferably formed with spaced annularly inwardly extending protuberances or beads 11 between which is secured a fixed insulated member or web 12 having spaced threaded openings for receiving the threaded bolts or binding screws 13 which constitute the fixed contacts. The inner end or bottom of the casing has a closure 14 provided with openings 15 through which extend the wires connected to the fixed contacts 13 and 21. The outer or exposed end of the casing is preferably provided with an annular groove 16 in which is rotatably secured the cover or face plate 17. The cover plate 17 has a plurality of openings 18 registering with the fixed contacts 13 and slidably carries the push buttons 19. A metallic plate or disc 20 is secured to the underside of the cover 17 by a medially disposed bolt 21, spaced washers 22 and a nut 22'. Between the plates 17 and 20 is preferably located a fiber washer 23.

The plate 20 is formed with a series of spaced, radially disposed flexible arms 24 corresponding in number to the number of fixed contacts, said arms being arranged to be interposed between and in alignment with adjacent contacts 13 and push buttons 19 to constitute movable contacts for establishing predetermined circuits with their adjacent fixed contacts. The plate 20 and arms 24 preferably are of flat flexible metal so that when one of the arms is displaced by a push button to be brought into engagement with its adjacent fixed contact 13, it will, upon the re-

lease of the push button, return to its normal horizontal position without being distorted or detrimentally affected by constant usage. The retaining bolt 21 secures the face plate 17 and contact plate 20 to each other and also constitutes a centrally disposed fixed contact common to each of the movable contacts 24 by reason of its connection through the lower washer 22 with the plate 20.

As the plate 17 and its associated parts are rotatable relative to the casing 10 and fixed contacts 13, it will be seen that the push buttons may be turned without affecting the position of the fixed contacts 13 so that other push buttons may be substituted in place of the recently used push buttons. Thus, means are provided for preventing an unauthorized observer from detecting the proper combination necessary to be actuated in order to complete a predetermined circuit. In other words, under constant usage, the particular push button selected to close the operating circuit may be discernible under careful observation due to signs of wear, lack of dust, finger marks, or the like, and thus enable an unauthorized person to operate the lock without knowledge or consent of the proper parties. Such a possibility as this is precluded due to the fact that the push buttons and movable contacts may be periodically turned to be brought into registration with different fixed contacts. In other words, any of the push buttons may be conveniently moved so as to actuate any of the fixed contacts without requiring access to the interior of the casing and at a minimum expenditure of time and effort. The fixed contacts 13 and the central contact 21 constitute terminals to which wires leading from the operable member may be detachably connected.

The contacts selected to be connected to the various operable members may be readily interchanged when desired. Moreover, as the cover plate in each of the switch panels or casings is rotatable relative to the fixed contacts, the movable contact may be turned so as to register with any of the fixed contacts whenever the surface of the cover plate or the push button show evidence of wear or other marks which might betray to a close observer the proper combination necessary to establish a circuit to one of the operable members for actuating the latter.

It is to be understood that the form of the invention shown is illustrative of a preferred embodiment and that such changes may be made as fall within the purview of one skilled in the art without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. A switch of the class described including a plurality of fixed contacts, a plate having movable contacts arranged to engage adjacent fixed contacts to close a predetermined circuit, said plate and movable contacts being rotatable relative to the fixed contacts whereby the movable contacts may be selectively brought into registration with the fixed contacts, and means for actuating the movable contacts to bring them into engagement with their adjacent fixed contacts to close the circuit.

2. A switch of the class described including spaced fixed contacts, a metallic member having uniformly spaced resilient arms extending outwardly therefrom in a right line and in the same transverse plane as said member, said arms being formed from the metallic member without being subjected to any permanent deformation or set out of their transverse plane and without detrimentally affecting the original elasticity of the metal and constituting movable contacts arranged to engage adjacent fixed contacts and normally disposed in a plane parallel to the fixed contacts, means for actuating each of the movable contacts for engagement with an adjacent fixed contact to close a predetermined circuit, the resiliency of each of the arms acting to return the same to its normal right line position when the actuating means is released and without acquiring any permanent deformation when subjected to constant usage, and means for rotating the movable contacts relative to the fixed contacts whereby the movable contacts may be selectively brought into registration with the fixed contacts without disturbing the circuits connected to the fixed contacts.

3. A switch of the class described including a plurality of fixed contacts disposed in substantially the same horizontal plane, a member having flat yieldable arms constituting movable contacts normally disposed substantially parallel to said horizontal plane and arranged to engage adjacent fixed contacts to close a predetermined circuit, and means for actuating the movable contacts to bring them into engagement with adjacent fixed contacts to close the circuit, said plate and movable contacts being rotatable relative to the fixed contacts whereby the movable contacts may be selectively brought into registration with any of the fixed contacts.

4. An electric switch device of the class described including a casing having fixed contacts mounted therein, a face plate closing one end of the casing and provided with openings registering with adjacent fixed contacts, movable contacts mounted in the casing and registering with the fixed contacts, means extending through the openings in the face plate for moving the movable contacts into engagement with their adjacent fixed contacts to close an electric circuit, and means revolubly connecting the face plate to the casing whereby the movable contacts may be selectively brought into registration with the fixed contacts.

5. An electric combination switch of the class described including a casing having spaced circumferentially disposed fixed contacts, a face plate closing one end of the casing and provided with openings in alignment with adjacent fixed contacts, a member secured to the underside of said face plate and having a series of flat yieldable arms extending outwardly from the center of the plate to constitute movable contacts, push buttons extending through openings in the face plate and arranged to move said arms into engagement with their adjacent fixed contacts to close an electric circuit established by said contacts, and means revolubly connecting the face plate to the casing, whereby the movable contacts and push buttons may be selectively moved into registration with the fixed contacts.

EDMOND MICHEL.