

Aug. 26, 1930.

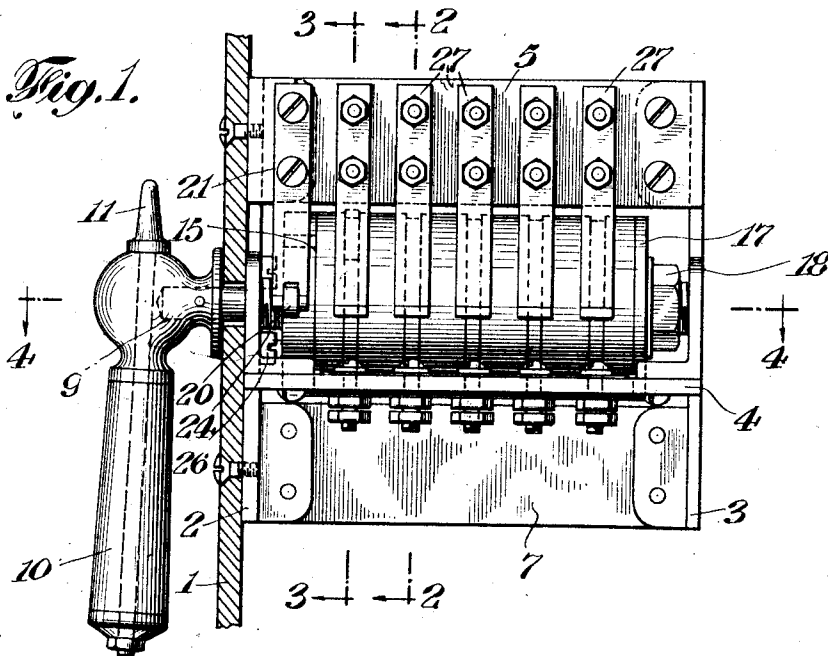
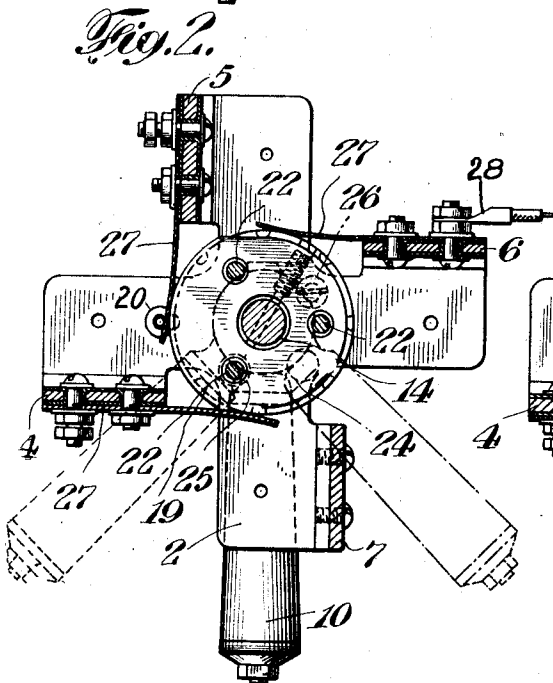
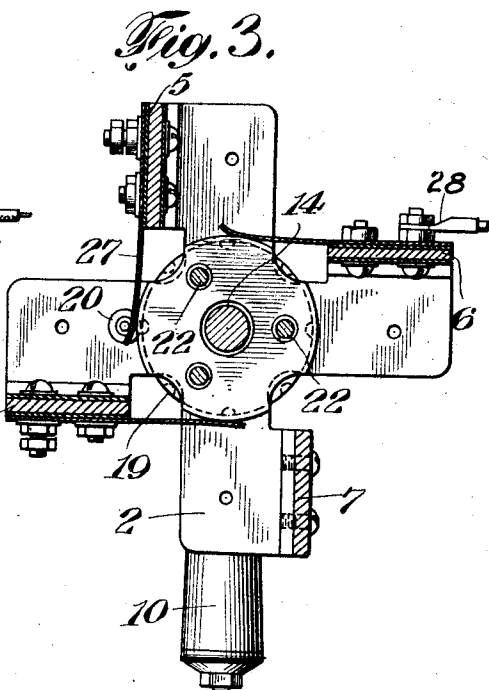
W. L. WALKER

1,773,830

MULTIPLE CONTROL SWITCH

Original Filed Sept. 5, 1925

2 Sheets-Sheet 1



INVENTOR
William L. Walker.

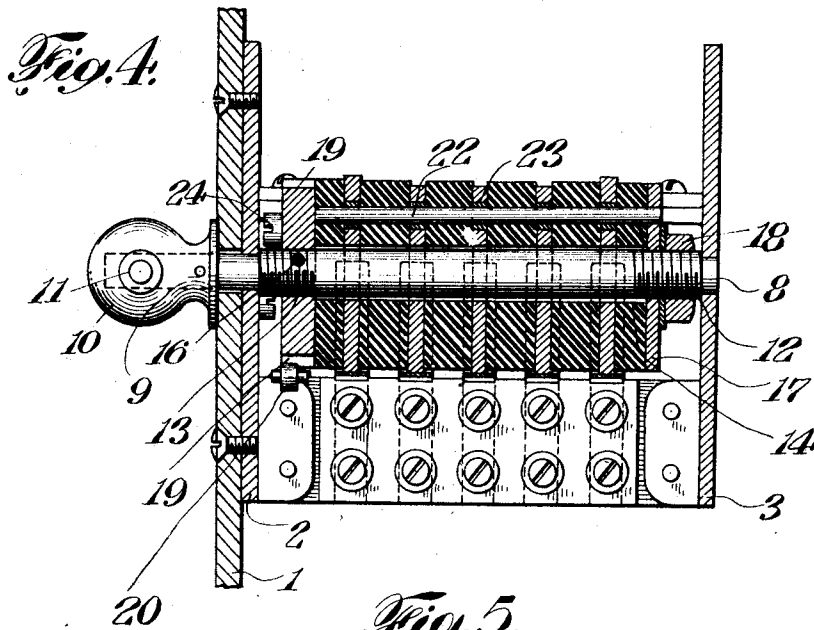
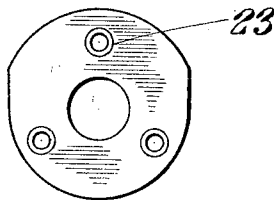
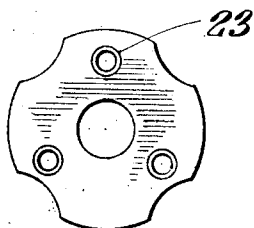
BY
Sheffield & Betts
HIS ATTORNEYS

W. L. WALKER

MULTIPLE CONTROL SWITCH

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2 Sheets-Sheet 2



INVENTOR,
William L. Walker.
BY *Sheffield-Betts*
HIS ATTORNEYS

UNITED STATES PATENT OFFICE

WILLIAM L. WALKER, OF NEW YORK, N. Y., ASSIGNOR TO WALKER SIGNAL & EQUIPMENT CORPORATION, A CORPORATION OF DELAWARE

MULTIPLE CONTROL SWITCH

Original application filed September 5, 1925, Serial No. 54,699. Divided and this application filed February 3, 1927. Serial No. 165,603.

This application is a division of application, Serial No. 54,699, filed by me September 5, 1925.

My invention relates to switches that are designed to control a plurality of electric circuits by the movement of a single switch handle into various positions including an off position depending upon the apparatus or devices designed to be placed in operation, but it is also applicable to other uses, such as sonic direction finders, fire control of guns and various intercommunicating systems.

Unusual conditions must be met in the design and installation of switches, such as are comprised in this invention, owing to their use on shipboard where they are often surrounded by moist and salty air and are subjected to very heavy shocks, in spite of which and other conditions the apparatus must be absolutely depended upon to function at the proper time with a minimum of attention and effort on the part of the operator.

In the present application I have described the details of a preferred form of switch which I have found to be very efficient and reliable in actual use, and which may comprise any number of poles with a relatively small number of parts so that it may be installed within a small cabinet or box, together with other apparatus constituting the instruments employed in receiving the submarine signals. The arrangement of the switches in relation to the other apparatus and instruments used is described and claimed in my copending application Serial No. 54,700, filed September 5, 1925.

For a detailed description of the preferred form of my invention, reference may be made to the following specification and to the accompanying drawings forming a part thereof, in which

Fig. 1 is a side elevation of my improved switch showing the panel on which it is mounted in section;

Fig. 2 is a horizontal or axial transverse sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a transverse sectional view taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a similar transverse sectional

view taken substantially on the line 4—4 of Fig. 1;

Fig. 5 is a side elevation of one of the switch contacting discs;

Fig. 6 is a side elevation of one of the short circuiting discs; and

Fig. 7 is a side elevation of one of the insulating washers which separate the contact discs.

Referring to Fig. 1, the numeral 1 indicates a supporting panel preferably made of insulating material, to which is attached one of the end plates or frames 2 of the switch structure; this frame is connected with the opposite end frame 3 by means of longitudinal supporting pieces 4, 5, 6 and 7. Passing through the central points of the end frames 2 and 3 is the longitudinal shaft 8 (Fig. 4). This terminates in the left hand end in a reduced portion 9 on which is secured the operating handle 10. The hub of said handle is preferably provided with a pointer 11 to indicate the positions of the handle. The shaft 8 is screw threaded on each end as indicated at 12 and 13, and is surrounded by insulating sleeve 14. On the screw threaded portion 13 is a disc 15 which is adapted to be retained rigidly in position by a pin 16 or other suitable means. The screw threaded portion 12 of shaft 8 also carries a disc 17 against which bears a retaining nut 18. The left hand disc 15 is provided on its periphery with a series of transverse grooves 19, shown in dotted lines in Figs. 3 and 4, and in section in Fig. 2. These grooves are adapted to receive a small roller 20, indicated in Figs. 1 and 2, mounted on the end of a spring arm 21 which is attached to the longitudinal supporting plate 5. This serves to indicate to the operator when the switch has been turned accurately to any one of the three positions in which it is intended to be placed, because the roller entering the grooves retards the rotation of the switch at definite points. The end discs or plates 15 and 17 are connected by longitudinal rods 22, which, passing through corresponding holes in the various contacts discs and washers, serve to hold them accurately in position on the shaft 8. These holes are equally

spaced from each other so as to permit the contact surface of the conducting discs to be placed in different angular positions about the shaft when so desired. The holes through the conducting discs have insulating bushings as indicated at 23, Figs. 5 and 6. The end disc 15 is provided with a screw 24 forming a stop to limit the rotation of the switch when contacting with the screws 25 and 26 on the end plate 2. The contact discs of the switches having been assembled in the desired relative positions, the same are thus mounted rigidly on the shaft 8 which is inserted between the end plates 2 and 3 so that the spring fingers 27 contact with the portions of said conducting discs which project above the insulating discs, as indicated in Figs. 1, 3 and 4. These spring fingers or brushes are mounted upon the longitudinal strips 4, 5 and 6, respectively, and are, of course, each insulated from said strips by suitable insulating sheets and bushings as indicated in Fig. 3. The machine screws which hold these brushes in position are provided with pairs of nuts which form the means for connecting the leads with the respective brushes as indicated at 28, in Figs. 2 and 3.

From the above description it will be appreciated that I have produced switches of compact, efficient and durable design which may be installed in a comparatively small space, such as in a receiving cabinet of a type indicated in my copending application Serial No. 54,700 above referred to.

Having thus described this form of my invention, I do not wish to be understood as being limited to the details of form and arrangement of parts shown for various changes may be made by those skilled in the art without departing from the spirit and scope of my invention as set forth in the accompanying claims.

What I claim and desire to protect by Letters Patent is:

1. A switch for controlling a plurality of circuits comprising, end members adapted to support a rotatable shaft, supporting members connecting said end members, a plurality of discs on said shaft provided with arcuate projections, insulating discs located between the first named discs and of slightly less radii than the radii of said projections but whose radii are greater than the radii of the main portion of said discs, a plurality of conducting brushes mounted on said supporting members and adapted to rest on said insulating discs and to contact alternately with said projections when said shaft is rotated, brushes mounted on one of said supporting members and contacting continuously with said projections, a disc on said shaft having a plurality of arcuate projections and brushes mounted on said supporting members adapted to contact with last said projections while

the circuits through the first named brushes are made and broken.

2. A switch for controlling a plurality of circuits comprising, end members adapted to support a rotatable shaft, supporting members connecting said end members, a plurality of discs on said shaft provided with arcuate projections, said discs being adapted to be placed in various angular positions with respect to said shaft, means extending through said discs to hold the same in position, a plurality of conducting brushes mounted on said supporting members and adapted to contact alternately with said projections when said shaft is rotated and brushes mounted on one of said supporting members and contacting continuously with said projections.

3. A switch for controlling a plurality of circuits comprising, end members adapted to support a rotatable shaft, supporting members connecting said end members, a plurality of discs on said shaft provided with arcuate projections, said discs being adapted to be placed in various angular positions with respect to said shaft, means extending through said discs to hold the same in position, insulating discs located between the first named discs and of slightly less radii than the radii of said projections but whose radii are greater than the radii of the main portion of the first named discs, a plurality of conducting brushes mounted on said supporting members and adapted to rest on said insulating discs and to contact alternately with said projections when said shaft is rotated, brushes mounted on one of said supporting members and contacting continuously with said projections, a disc on said shaft having a plurality of arcuate projections and brushes mounted on said supporting members adapted to contact with last said projections while the circuits through the first named brushes are made and broken.

4. A switch for controlling a plurality of circuits comprising, end members adapted to support a rotatable shaft, supporting members connecting said end members, a plurality of insulated discs on said shaft provided with arcuate projections, a plurality of conducting brushes mounted on said supporting members and adapted to contact alternately with said projections when said shaft is rotated, brushes mounted on one of said supporting members and contacting continuously with said projections, a disc on said shaft having camming grooves therein and a follower mounted on one of said supporting members adapted to engage in said grooves to indicate when the circuits through said brushes are made and broken.

5. A switch for controlling a plurality of circuits comprising, end members adapted to support a rotatable shaft, supporting members connecting said end members, a plu-

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said projections, a disc on said shaft having
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are made and broken, a disc on said shaft hav-
ing camming grooves therein and a follower
mounted on one of said supporting members
30 adapted to engage in said grooves to indi-
cate when the circuits through said brushes
are made and broken.

Signed at New York, N. Y., this 2nd day
of February, 1927.

WILLIAM L. WALKER.