C. HENSCHEL.

SIGNALING DEVICE.

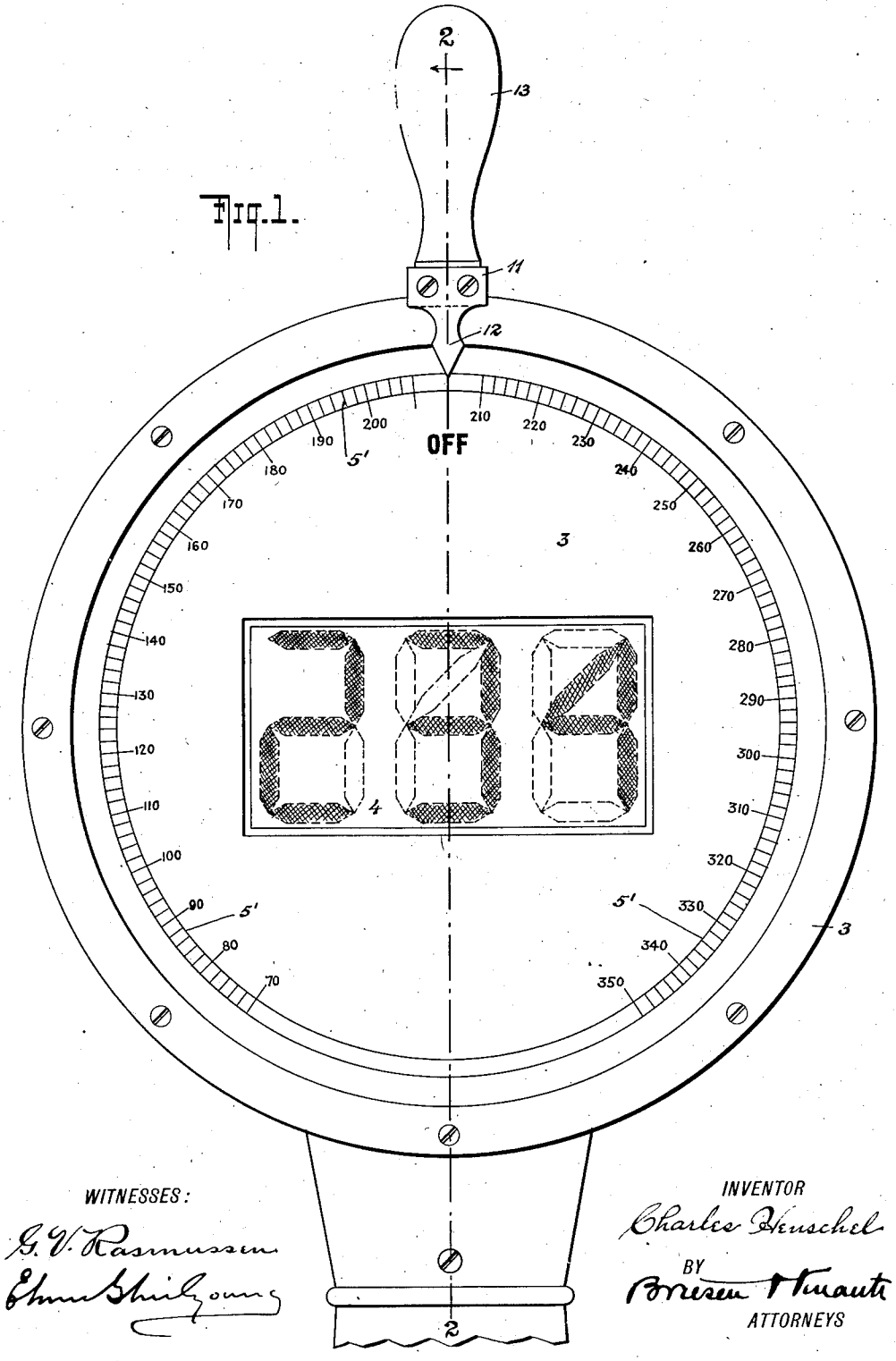
APPLICATION FILED APR. 18, 1910.

1,090,816.

Patented Mar. 17, 1914.

4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

G. V. Rasmussen

Edmund Shilgoung

INVENTOR

Charles Henschel

BY

Briesen & Knauth

ATTORNEYS

C. HENSCHEL.

SIGNALING DEVICE.

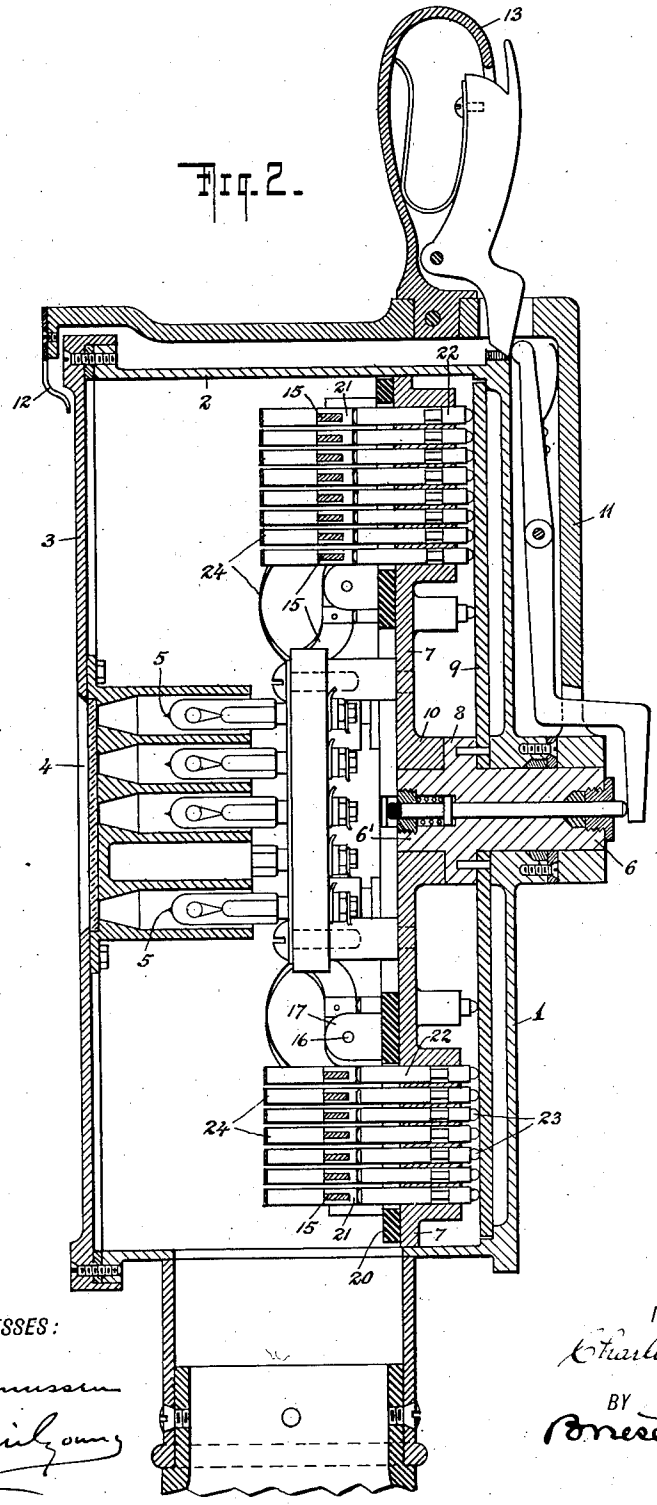
APPLICATION FILED APR. 18, 1910.

1,090,816.

Patented Mar. 17, 1914.

4 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

G. V. Rasmussen

Edmund Shilgoway

INVENTOR

Charles Henschel

BY

Breese Newman & Breese

ATTORNEYS

C. HENSCHEL.

SIGNALING DEVICE.

APPLICATION FILED APR. 18, 1910.

1,090,816.

Patented Mar. 17, 1914.

4 SHEETS—SHEET 3.

Fig. 3.

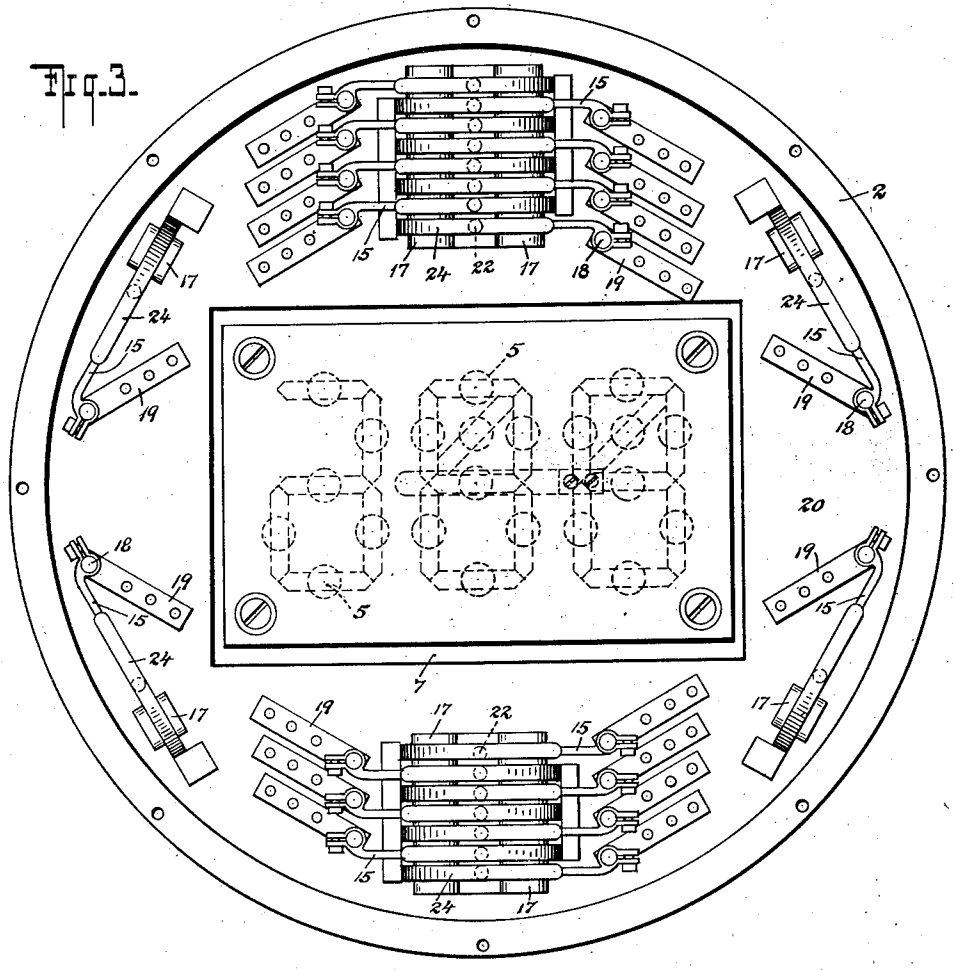
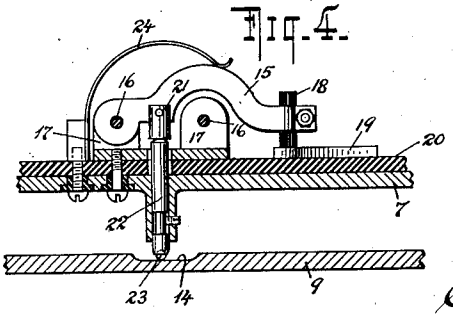


Fig. 4.



WITNESSES:

G. V. Rasmussen

Edmund Shirkyoung

INVENTOR

Charles Henschel

BY

Breese & Kinnaird

ATTORNEYS

C. HENSCHEL.

SIGNALING DEVICE.

APPLICATION FILED APR. 18, 1910.

1,090,816.

Patented Mar. 17, 1914.

4 SHEETS—SHEET 4.

Fig. 5.

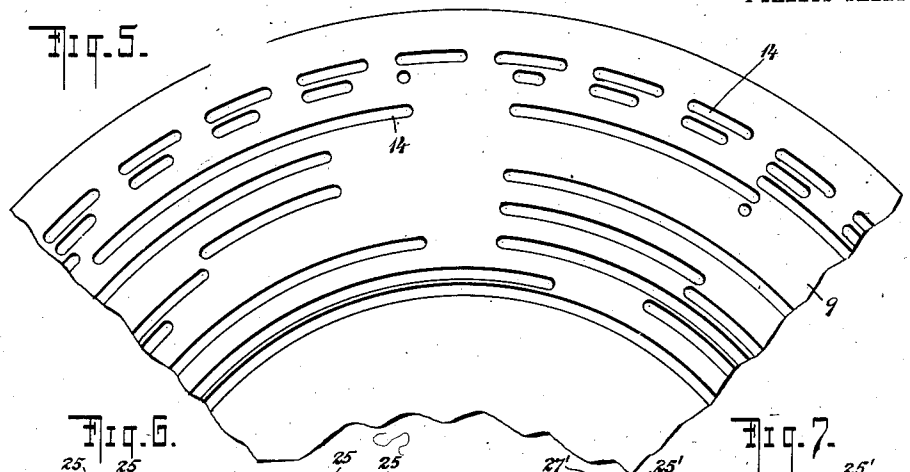


Fig. 6.

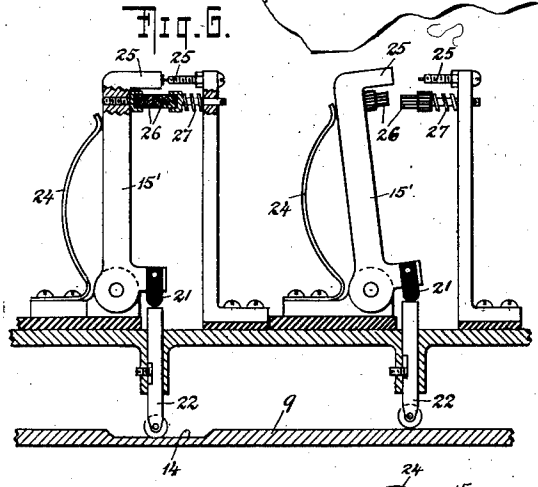


Fig. 7.

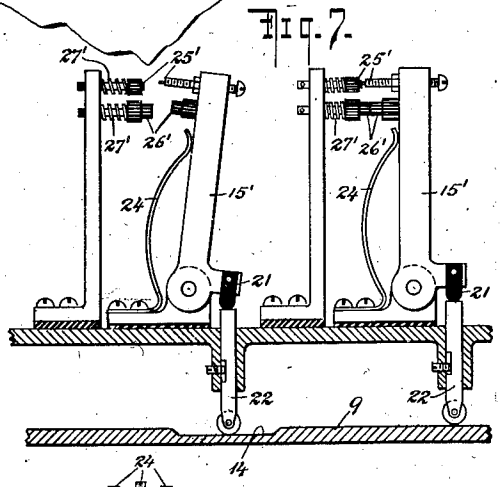


Fig. 8.

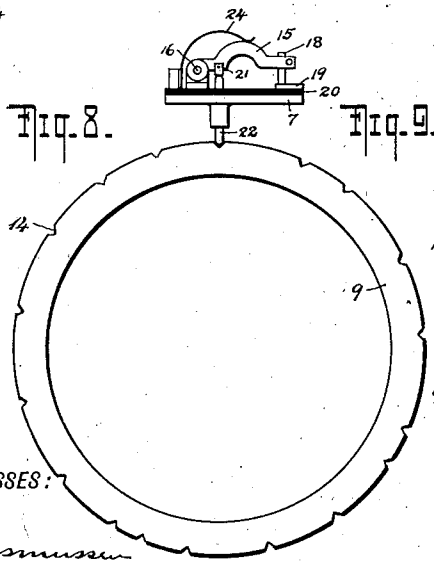


Fig. 9.

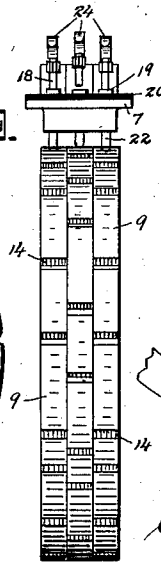
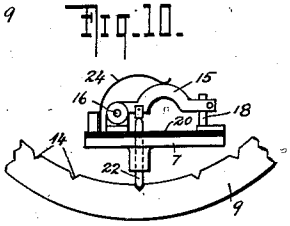


Fig. 10.



WITNESSES:

G. V. Rasmussen

Edmund Shilgoung

INVENTOR

Charles Henschel

BY

Brenner Wright

ATTORNEYS

UNITED STATES PATENT OFFICE.

CHARLES HENSCHEL, OF NEW YORK, N. Y., ASSIGNOR TO CHAS. CORY & SON, INC., A CORPORATION OF NEW YORK.

SIGNALING DEVICE.

1,090,816. Specification of Letters Patent. Patented Mar. 17, 1914.

Application filed April 18, 1910. Serial No. 556,009.

To all whom it may concern:

Be it known that I, CHARLES HENSCHEL, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Signaling Devices, of which the following is a specification.

My invention relates to signaling devices in which signals are formed at a receiving station by lighting certain electric lamps selected from a suitably arranged group of such lamps, the lamps selected being determined by the setting of a suitable device at the transmitting station.

My invention relates more particularly to such devices when used on shipboard for the purposes of transmitting signals to those engaged in operating the ship or the guns.

The object of my invention is to provide an improved arrangement of switches or contacts for closing the circuits of the various signal lamps together with an improved means for manipulating such switches, so that the operation of the switches is positive and certain without risk of burning out contact points or short circuiting.

Other objects will appear as the specification proceeds.

Referring to the drawings accompanying, which are made a part of this specification, Figure 1 is a view in elevation of a preferred form of transmitter (or receiver) embodying my invention; Fig. 2 is a section taken along the line 2—2 of Fig. 1; Fig. 3 is an elevation similar to Fig. 1 but with the dial plate removed to show the arrangement of switches with reference to the signal lamps; Fig. 4 is a section, partly in elevation, showing one form of contact switch used in my invention in its closed position; Fig. 5 is a plan view, somewhat enlarged, of a part of the control disk used to operate the various switches; Fig. 6 is an elevation, partly in section, showing a modified form of switch in closed position (at the left) and in open position (at the right); Fig. 7 shows still another modification of the switch in open position (at the left) and in closed position (at the right); Fig. 8 shows, diagrammatically, an arrangement of my invention in which the control disk is equivalented by a cylinder; Fig. 9 is a view in elevation of Fig. 8; and Fig. 10 is a diagrammatic view showing how the control cylinder of Fig. 8 could be replaced by a similar cylinder arranged to operate the switch from its inner instead of from its outer surface.

The general type of signaling device which I have shown in the drawings above referred to is well known in the art and comprises essentially two identical instruments connected by suitable wiring to one another and to a source of electrical energy, one of said instruments being used as a transmitter and one as a receiver. Each instrument consists of a group of electrical elements (lamps in the particular apparatus shown) a plurality of switches controlling the circuits of said elements, and a control disk arranged to operate said switches so as to actuate selected elements according as the control disk is rotated into one position or another as the case may be. In the form of signaling device which I have selected for the purposes of illustration, the signals are given in the form of numbers and a dial plate is connected with the control disk so that with the aid of a suitably disposed fiducial mark the control disk may be set to any desired number, which number is indicated by the signal lamps. The lamps on transmitter and receiver are either joined in series so that the sending station may have ocular evidence that a correct signal is transmitted, or the lamps on each instrument may be connected to the sending switches of the other instrument, in which case each instrument may be used to form signals at the other instrument independently.

Signaling instruments, as here referred to, and as previously made, have commonly and generally, so far as I am aware, embodied a control disk (or its equivalent cylinder) carrying segments which actually become part of the several lamp circuits as said circuits were actuated. The usual form of control disk has been a disk composed of insulating material with contact segments of copper upon or let into its surface. In the operation of such a control disk, sparking when electrical contact has been made or broken has been difficult to avoid. The result of such sparking is, as is well known, cumulative, making the contact segments ragged at an increasingly rapid rate. Another difficulty often met with in arrangements of this kind is the liability of a film

of metal to be dragged from the contact segments and deposited upon the insulating surface, thus leading to short circuits and general disarrangement of the apparatus.

My invention is particularly directed to the overcoming of these difficulties, and consists in substituting for the usual control disk as just described a disk which has no function, except to mechanically catch the switches, which latter are themselves completely removed from the control disk, so that said disk forms no part of the electrical circuits.

The invention consists also in the means and manner by which and in which the switches are actuated; also in the arrangement of the switches and in the character of their construction. In this way the switches can be located at any convenient place and the best principles of switch construction can be utilized without serious compromises due to special character of the controlling mechanism. The control disk, since it has a purely mechanical function to perform, can be made of metal and is thus much more rigid, durable and permanent. A further advantage of my improved arrangement is that by suitably constructing the switches, any particular switch or part of a switch may easily be removed and replaced in case of trouble.

Referring to the drawings in detail, the essential parts of the instrument, aside from the connecting wires, are contained in a head 1, comprising a shell 2, having a back and provided with a removable cover or dial plate 3 at the center of which is a rectangular opening 4 covered with ground glass behind which is the group of lamps 5, various combinations of which lamps are to be determined by the device. The dial plate 3 is provided with a circumferentially arranged system of graduations 5′ comprising numbers from 70 to 350 inclusive and covering about 300° of arc. The back of head 2 is provided with a boss extending both inwardly and outwardly, which is bored to form an outer bearing for a short spindle 6. The other end 6′ of this spindle is finished to work in a suitably bored bearing at the center of the disk or switch plate 7 upon which are mounted the various switches as well as the group of signal lamps. Spindle 6 is formed with a collar 8 against one side of which is pinned the control disk 9, while its other side bears against the faced boss 10 formed on plate 7 through which is bored the bearing for the spindle end 6′.

Fixed to spindle 6 at the rear head 2 is a setting lever 11, which passes up and to the front over the head so as to overhang the same and is provided with an index 12 to cooperate with the dial plate. A handle 13 enables the lever to be moved and control disk 9 set in any desired position.

The control disk 9 is preferably made of a single plate of chilled iron or hardened steel. In its front face are cut shallow concentric grooves 14 of varying lengths and spaced at varying distances from the center. These grooves are preferably semi-circular in section and should be sloped gradually up to the surface of the disk at their ends for reasons which will presently appear.

Figs. 2 and 3 show a preferred arrangement of switches upon the switch plate 7. The type of switch used in these two figures is shown in enlarged detail in Fig. 4. As drawn there are eight switches placed side by side at the upper part of the switch plate and seven switches at the lower part; two more switches are arranged above and below on each side there being thus provided 19 switches in all.

The switch itself (Fig. 4), comprises a lever 15 pivoted at 16 to a suitable lug 17. At the end of the lever is a carbon contact point 18 adapted to close against a metallic contact segment 19. The lug 17 and segment 19 are both fixed to the switch plate 7, an insulating plate 20 being interposed.

Attached to lever 15 at about one-third its length from pivot 16 is a downwardly projecting pin 21 of insulating material. This pin is positioned to rest against an actuating pin 22 having at its lower end a loosely held friction ball 23 adapted to rest upon control disk 9, and which passes through the switch plate and has sliding fit with said switch plate. A spring 24 suitably supported presses downwardly upon lever 15 so as to keep the contact points 18 and 19 normally together. The length of pin 22 is so determined that when ball 23 rests upon the top of plate 9 the contacts 18 and 19 will be open while when it is in the bottom of a groove 14 these contacts will be closed.

To send any given signal the handle 13 is grasped and the dial plate moved so that the fiducial mark 12 rests upon the particular signal number to be transmitted. Thus in Fig. 1 to send the signal 234 shown by the hatching at the center the dial must be turned counter clockwise until the index 12 is upon the index line 324. This will bring certain particular grooves 14 under the particular pins 22 belonging to the particular switches controlling the particular lamps corresponding to the 14 different lamps required to make up the number 324 as indicated on the drawings.

In order that pins 22 may drop into and be raised out of the grooves 14 with a minimum of jar and wear the ends of said grooves are gently sloped to the surface of control disk 9; the ball or roller 23 aids to the same end.

In Fig. 6 is shown a modified form of switch in which lever 15′ is arranged ver-

tically instead of horizontally. In this switch also are embodied two sets of contacts in parallel with one another, viz., 25 and 26. Contacts 26 should be of carbon or some other substantially non-arcing and low conductivity material and a spring should be used to keep one member of contact system 26 pressed outwardly so that these particular contacts will be closed before and opened after contacts 25 as the switch is closed and opened.

The switch shown in Fig. 7 differs but little from that shown in Fig. 6 save that its contacts are closed when pin 22 is upon the surface of disk 9 and open when pin 22 is at the bottom of a groove instead of vice versa as in the latter figure. Both contacts 25′ and 26′ have here been provided with springs 27′, also instead of only one as in Fig. 6.

The form of switch shown in Fig. 4 may, of course, easily be arranged to use the particular type of contact points of either Fig. 6 and Fig. 7. It may also be arranged to open the circuit when pin 22 is at the bottom of a groove 14 as does the switch of Fig. 7.

In the form of my invention shown in Figs. 8 and 9, the flat control disk above described takes the form of an axially rotatable cylinder the grooves 14 being arranged around the periphery thereof and those for different individual switches being in different parallel planes spaced apart to correspond with the spacing of the switches themselves along the cylinder; as drawn the grooves 14 are simple V's instead of elongated grooves as in the case of the flat control disk previously described and the closure of the switch is, hence, correspondingly short.

In Fig. 10 I show exactly the same arrangement as is shown in Figs. 8 and 9 except that the grooves 14 and the switches are arranged on the inside of the cylinder instead of on the outside.

The peripheral width of grooves 14 in Figs. 8 and 10 corresponds to the circumferential length of the grooves in the flat disk and may be varied to suit requirements.

Variations of detail may be made in the control disk, in the switches and in various other features of the device as above described and shown in the drawings, without departing from the spirit of my invention which I have defined in the following claim.

I claim—

As an article of manufacture a signaling device comprising a rotatable control disk provided on a side thereof with a plurality of concentric grooves whose ends slope gradually to the surface of the disk, a switch plate adjacent to and parallel with said control disk, a plurality of circuit controlling switches mounted upon said switch plate, and a series of pins slidably supported in said switch plate adjacent to said switches, and normal to the control disk and adapted to have their ends received by said grooves so as to actuate said switches, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CHARLES HENSCHEL.

Witnesses:
ELMER G. WILLYOUNG,
FRANK F. KIRKPATRICK.