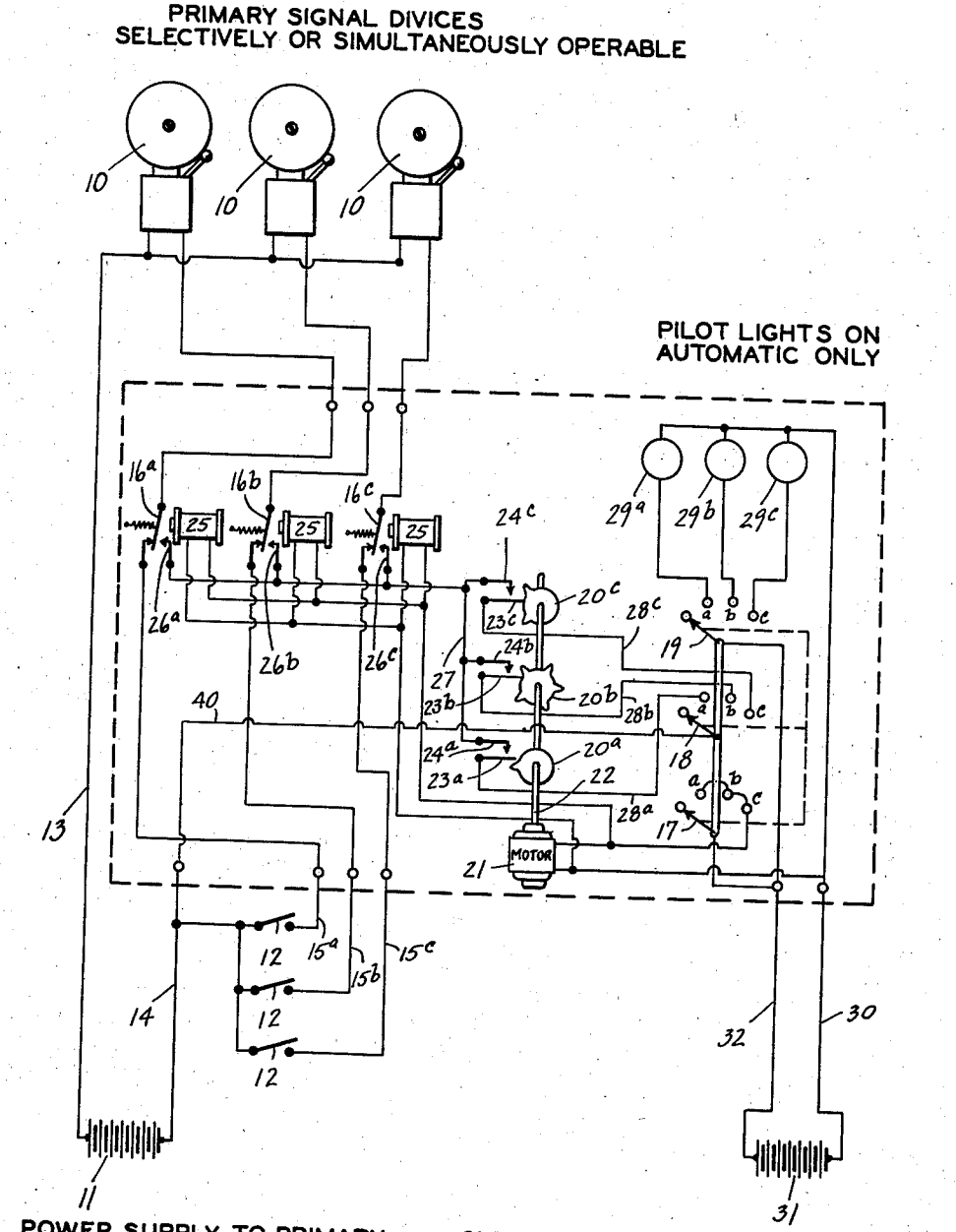
Dec. 4, 1945. A. N. MONTGOMERY 2,390,449

ALARM SYSTEM

Filed June 29, 1942



INVENTOR.
ARVID N. MONTGOMERY.

BY Lockwood, Goldsmith & Galt.
ATTORNEYS.

Patented Dec. 4, 1945 2,390,449

UNITED STATES PATENT OFFICE

2,390,449

ALARM SYSTEM

Arvid N. Montgomery, Owensville, Ind.

Application June 29, 1942, Serial No. 448,941

6 Claims. (Cl. 177—380)

This invention relates to an alarm system for public buildings, schools, stores and the like, and more particularly, to an automatic electric control therefor adapted to simultaneously cut out the normal run of various routine of signals, such as any siren or horn circuits, and cut in preselected coded signals, such as may be employed as fire or air raid alarms, and the like.

The object of the invention is to provide a system having incorporated therein the usual signal devices as commonly used in schools, factories, stores and the like, and which is generally continuously and automatically operated at predetermined time intervals, and further including a coded alarm, which, when placed into operation, simultaneously cuts out the signaling system to selectively operate a series of coded alarms.

More particularly, by means of this system, in installations having a plurality of different circuits with widely separated signal devices, all of said signal circuits may be cut out, and a selected code alarm sent thereover to all signal devices as a unit.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims.

The drawing is a diagrammatic illustration of the signal and alarm system.

There is herein illustrated for purposes of example an electrically-actuated signal and alarm system wherein there is employed a plurality of bells, horns, sirens or the like, indicated at 10, utilized normally for paging or giving out signals. Such audible signal devices are each normally included in a plurality of individual electric circuits which may have a common source of current indicated at 11 and be selectively controlled by automatic contacting devices or hand switches, indicated at 12. The controlling switches 12 may be at any desired location, whereas the signal circuits and devices 10 of any desired number or character, may be distributed throughout the building or buildings. The signal circuits, including the aforesaid signal devices, source of current and control switches, include the common line 13 leading from the source of current to the respective signal devices, the line 14 leading from said source to the several control switches, and the individual circuit lines 15*a*, 15*b* and 15*c* leading through the spring biased normally closed switches 16*a*, 16*b* and 16*c* to their respective signal devices 10. Said last mentioned switches may be either electrically or mechanically actuated.

In operating the alarm through all signals the control switches 12 are not closed and selected code-operated switches are placed in circuit. For this purpose there is placed at a convenient location a master alarm switch 17 operating over contacts *a*, *b* and *c*. Said master switch is mechanically connected with a selector switch 18 similarly operating over corresponding contacts *a*, *b* and *c*. Also, mechanically connected therewith there is a pilot switch 19 similarly operating over corresponding contacts *a*, *b* and *c*. Obviously, as many additional contacts in each switch may be provided as necessary, and said several switches 17, 18 and 19 may be embodied in a single manually operated selector switch structure.

For purposes of illustration there are three contacts herein shown, switch 17 being moved to close the circuit through contact *a* for giving an "alert" signal, contact *b* for an "alarm" signal, and contact *c* for an "all clear" signal. In circuit with each of these contacts there is a series of motor driven coding disks indicated at 20*a*, 20*b* and 20*c*. Said disks are of insulation and driven by an electric motor 21 through shaft 22. Said coding disks are formed to operate their respective contact arms 23*a*, 23*b* and 23*c* to make and break a circuit through contact 24*a*, 24*b* and 24*c*, respectively, in accordance with the character of the alarm to be given.

Associated with each of the switches 16*a*, 16*b* and 16*c* there are suitable electromagnetic relays indicated at 25 adapted when energized to break the circuit through the lines 15*a*, 15*b* and 15*c*, and cause said switches 16*a*, 16*b* and 16*c* to close the circuit through the contacts 26*a*, 26*b* and 26*c*, respectively, whereby the line 27, common to the coding disc switches, will be placed in circuit with the signal devices 10 and the normally closed control switches will be cut out of said circuit. The line 27 includes in said circuits with the signal devices the coding disk circuits, through the contacts 24*a*, 24*b* and 24*c*. The contact is made in accordance with the particular lobal character of each coding disk through their lobe actuated arms 23*a*, 23*b* and 23*c* which are connected in circuit by the lines 28*a*, 28*b* and 28*c* with the corresponding contacts of the selector switch 18. Connected with each of the contacts *a*, *b* and *c* of the pilot switch 19 there are pilot lamps 29*a*, 29*b* and 29*c*, said circuits including a line 30 leading to a power source 31, the other line 32 of said power source leading back to said pilot lamps through the switch 19 and the contacts *a*, *b* and *c* thereof. The motor 21 is in circuit with the power source 31 through the switch 17 through any contact *a*, *b* or *c* thereof, as are also the relays, since they are each connected in parallel and with the motor 21.

In normal operation of the system, the control

switches 12 operate through a program clock or any other well known automatic type of contact device, push buttons, or the like, as employed in paging or normal working signals as commonly practiced. In normal operation, the switches 16a, 16b and 16c close the several circuits through the lines 15a, 15b and 15c to the several signals 10.

In event of a signal alarm, and for purpose of illustration, an "alert," the switch 17 is moved from its off position to contact a. This closes the circuit from the source 31 to the motor 21 which will start driving all of the coding disks 20a, 20b and 20c. At the same time it will mechanically move the selector switch 18 to contact a and thereby condition the circuit for operation through the coding disk 20a. Also, through the contact 17a, the circuit will be closed not only through the motor 21 but through each of the relays 25. Upon said relays being energized, the circuit will be broken through the normal signal system or lines 15a, 15b and 15c, by reason of the switches 16a, 16b and 16c being moved to engagement with contacts 26a, 26b and 26c.

Thus, upon throwing the switch 17 to contact a, the signalling system will be thrown out of normal circuit and the system will be placed in condition for operation through the special coding disk 20a. Said coding disk is so formed as to intermittently or otherwise close the alternate circuit to the signalling devices 10 from source 11, by branch 40 and through selector switch 18, line 28a, and the arm 23a according to the prearranged "alert" alarm. Said signalling devices will thereupon give such alarm until switch 17 is again operated. Also, upon operation of the alarm switch 17, through its mechanical connection with the pilot switch 19, the pilot lamp circuit will be closed through contact a so that pilot lamp 29a will be lighted to show that this particular or "alert" alarm is then being given.

If the alarm switch 17 is returned to inoperative or open circuit position, all circuits through the relays 25, motor 21, coding disc operable switches and pilot lights 29a, 29b and 29c will be disconnected and the normal signalling circuit initially described will again be placed in operation.

If a different and additional signal, such as an alarm, "all clear," is to be given, switch 17 is manually moved to the corresponding contact which is indicated at b or c. At contact b the motor 21 and relays 25 will similarly be actuated to disconnect the normal signal system and only the coding disk 20b will be placed in operation as would be indicated by operating the pilot lamp 29b. Similarly, if the switch 17 were moved to contact c, the alarm would be given only in accordance with the coding disk 20c operation as would be indicated by the pilot lamp 29c.

Whereas there is illustrated herein a single signal device 10 for each of the individual circuits 15a, 15b and 15c, it should be recognized that in practice each of said individual initial or primary circuits ordinarily may carry one or more of said signal devices.

The invention claimed is:

1. A signal and alarm system comprising in combination a plurality of electric signalling devices, a single circuit for each of said signal devices and including a control switch normally biased to closed circuit position, a similar number of manually operated switches, each included in a single circuit for rendering said single circuit effective to independently actuate said signal devices, electric current actuable means arranged to simultaneously open all biased switches, a control circuit for said means including a master switch, an alternative alarm circuit for the signal devices and including a switch actuated by a coding disc, a disc driving motor in said control circuit and controlled by the master switch thereof, and an electric energy supply for actuating said first mentioned means to open the biased switches when the said master switch is closed, the latter connecting the alarm circuit to all of said signal devices whereby the latter will be controlled and operated as a unit, and only through said coding disc actuated switch.

2. A signal and alarm system as defined by claim 1 wherein there is provided at least one additional alarm circuit and in parallel with the alternative alarm circuit, each additional circuit including a coding disc, all discs being motor operable, each alarm circuit including another switch, said last mentioned switches being selectively operable with the master switch for selectively conditioning for operation one of the alarm circuits.

3. An alarm system including an electric signal device, an alarm circuit for said signal device comprising a normally open switch in said alarm circuit, and a normally open, coding disc operated, switch also in said alarm circuit, a coding disc operably associated with said coding disc switch for closing same and permitting opening of the disc operable switch, a motor for driving said disc to determine the periodicity of the signal actuation, a primary circuit for the motor, a manually operable master switch in the primary circuit, electrically actuated means for closing the first mentioned switch, an electric circuit for said means and in shunt with the primary circuit and controlled by said master switch, and another switch in series with the coding disc switch and simultaneously movable with the master switch.

4. An alarm system, as defined by claim 3, wherein there is provided an alternative control circuit to the device and including a manually operable normally open switch, and a contact juxtapositioned to and normally contacted by the first mentioned normally open switch, said last mentioned control circuit being in shunt with the coding disc operable switch including circuit.

5. An alarm system as defined by claim 3 wherein there is provided a second signal device, a circuit therefor, a switch therein controlling same, said second device circuit being in multiple with the motor primary circuit but independent of master switch electrical control, and means operable in the master switch manual operation for second signal device switch operation.

6. An alarm system as defined by claim 3 wherein there is provided an alternative control circuit to the device and including a manually operable normally open switch, and a contact juxtapositioned to and normally contacted by the first mentioned normally open switch, said last mentioned control circuit being in shunt with the coding disc operable switch including circuit, a second signal device, a circuit therefor, a switch therein controlling same, said second device circuit being in multiple with the motor primary circuit but independent of master switch electrical control, and means operable in the master switch manual operation for second signal device switch operation.

ARVID N. MONTGOMERY.