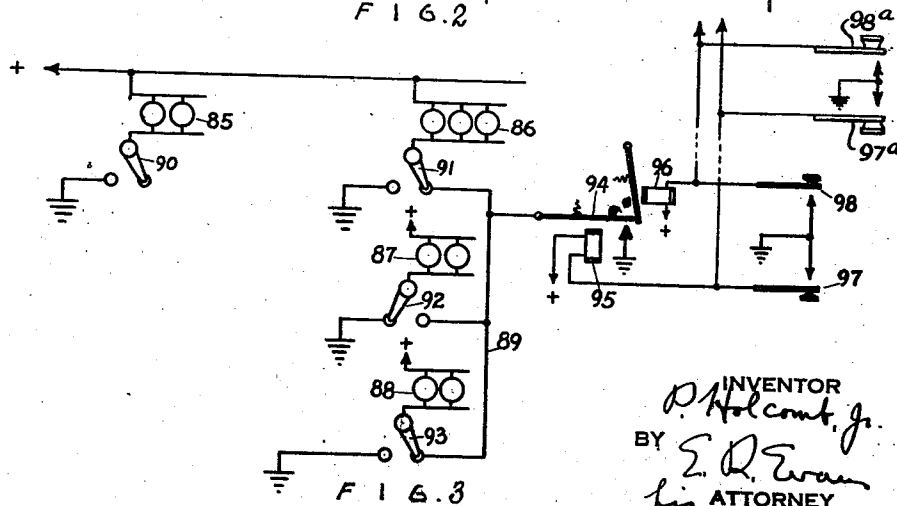
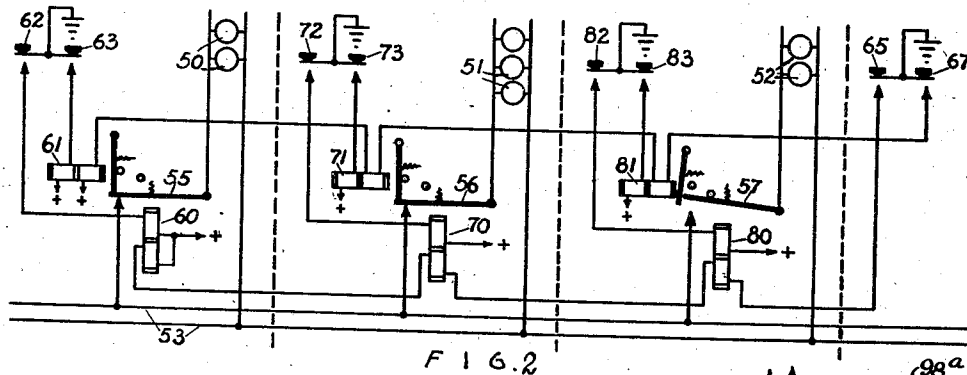
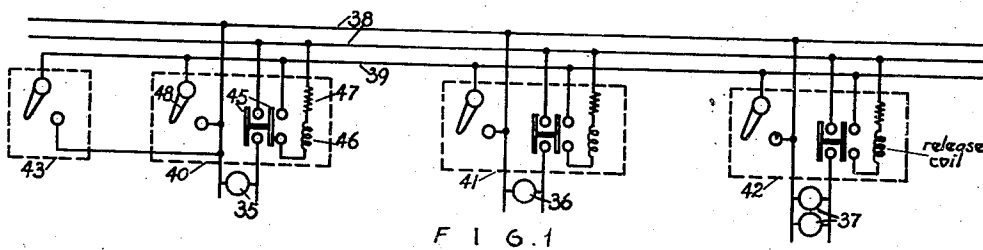


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P. HOLCOMB, JR
LIGHTING CONTROL SYSTEM

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LIGHTING CONTROL SYSTEM

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6 Claims. (Cl. 176—8)

This invention relates to electrical control systems and more particularly to remote control systems for house, office or factory lighting circuits.

In accordance with the invention, a simple and improved system is provided whereby the lights in a home or other building, in addition to being controlled by the individual control switches for each lamp cluster or set of lamps in the usual manner, may be turned "on" or "off" in groups from one or more master control stations or conveniently located switches.

In a factory, office building or warehouse, the customary location of lighting controls makes it impractical or difficult for the watchman to make efficient use of the electric lights in the building while making his round at night. Ordinarily the lighting installation is not used but the watchman carries a portable lantern or flashlight in order to avoid the labor and delay of operating a large number of individual switches and retracing his steps frequently to turn "off" lights that he has turned "on" for inspection of the premises in spite of the fact that the effectiveness of his work would be greatly enhanced if the entire area were flooded with light from the regular lighting fixtures. By utilizing the invention, the control of the lights either individually or in groups is rendered possible from convenient locations in accordance with the watchman's requirements and for other purposes. Preferably the system is arranged not to disturb or affect the lighted lamps, for example in occupied rooms or spaces, but only those that have been turned "off" by their individual switches.

In the home it is often desirable to control all of the lamps from one control point, or from any one of several points, as for example to flood the house with light in an emergency or to make certain that all the lights have been extinguished upon retiring. In case of attempted burglary or the presence of prowlers in the grounds surrounding a home, it is often possible to frighten the intruders away, even after entry has been effected, by lighting the rooms and porches of the house. It is obviously desirable to do this quickly and by means of a master control switch located upstairs or far removed from the point at which entry is being effected or attempted. If a master control switch is also arranged to extinguish all of the lights or those likely to be left "on," it is possible to insure against the common occurrence of lights left "on" in the cellar or elsewhere until accidentally discovered. It is also possible with a system of this character for a

person to turn "on" the lights in several rooms, for example when he enters or leaves the house late at night, and then extinguish all of the lights from the upper hall or porch as the case may be, thereby avoiding the necessity of traversing darkened rooms or hallways as at present. Other advantages of a lighting installation embodying the invention will be apparent.

It is an object of the invention to provide flexible lighting control systems whereby the value and usefulness of electric illuminating systems for homes, office buildings and the like may be enhanced as pointed out above and in other ways, and substantial economies obtained.

Another object of the invention is to provide a lighting control system having simplified, low-voltage control circuits to facilitate installation and reduce fire-hazard, to mention only a few of its advantages.

Other objects and advantages of the invention will appear from the following description of the preferred embodiments thereof shown on the accompanying drawing, wherein

Fig. 1 is a circuit diagram of a system embodying the invention arranged to turn "off" all lights that are "on";

Fig. 2 is a similar diagram of a system embodying the invention arranged to turn lights "on" or "off" either individually or in groups by means of separate low-voltage control circuits; and

Fig. 3 is a circuit diagram of a system in which the lights which are turned "off" at their individual switches may be turned "on" or "off" collectively, as desired, from one or more master control stations.

The advantages of the invention may be realized in various systems designed to meet the varying requirements of different lighting installations. For example, the control switches may be arranged to turn "on" and "off" the local lights in the conventional manner and, in addition to turn "off" collectively all of the lights arranged for remote control. In the home this system will insure against lights being left "on" in the cellar or in unused rooms for indefinite periods, and in the factory or office building, it will enable a watchman to use the regular lighting fixtures during his rounds without having to retrace his steps to turn "out" the lights. A control system of this character is shown in Fig. 1, wherein lights 35, 36 and 37 are arranged to be supplied with current from a supply circuit 38. A control conductor 39 of a second or auxiliary supply circuit parallels the supply circuit 38. Switches at the control stations 40, 41 and 42 are

provided for controlling the lights 35, 36 and 37 either individually or in groups, and auxiliary master or group control switches such as the switch 43 are provided wherever desired for the purpose of extinguishing all of the lights that may be turned "on." The control stations 40, 41 and 42 are similar and therefore a description of the control station 40 will suffice. The individual control switch 40 comprises a double-pole switch, which may be similar to the standard wall switch, having switch members 45 arranged to make and break the circuit of the lamp or set of lamps 35 and also control the circuit of a release coil 46 connected in series relation with a resistor 47 to one side of the supply circuit 38. When the switch members 45 have been closed to turn on the associated light and the release coil 46 is energized as described hereinafter, the said members are released or unlatched and return to the open-circuit position as in the conventional latched circuit-breaker. The release coil 46 may take the form of a solenoid for a magnetic latch mechanism or of a heating coil for a thermostatic release.

The circuit of the release coil 46 includes the right hand switch member 45, the conductor 39 and the master control switch 48 or any of the other parallel master control switches, including the switch 43, whereby the closure of any of the last-mentioned switches energizes the release coil 46 to open the switch 45 and extinguish the lamp 35. Since the release coils of the other switches at control stations 41, 42, etc., are in parallel with the release coil 46, these release coils will also be energized by the closure of any of the master control switches to extinguish the lamps 36 and 37 if these lamps are lighted. Thus all of the lights which are turned "on" are simultaneously turned "off" upon the closure of any of the master or group control switches. If it is desired that certain lamps of the system be not subject to remote control, the associated switches are not of the latched type or the release coils thereof are rendered inoperative in any desired manner.

In the modified system shown in Fig. 2, the control circuits are independent of the lighting circuits. This arrangement has the advantage that the control switches may conveniently be located at one or more panel boards, for example on the fuse panel of the power supply system, and low-voltage control circuits may be employed. Thus the wiring to the control switches is inexpensive, may be run on or under the surface of walls or ceilings and may be extended or altered at any time at little cost. Since the circuit is of low potential, concentric wiring may be used. This wiring comprises a central conductor insulated from a second surrounding conductor which is grounded, both conductors being enclosed in a protective sheath of lead or other suitable material. In the specific embodiment shown, separate groups of lamps 50, 51 and 52 are energized from a supply circuit 53 through magnetically operated switches 55, 56 and 57, respectively. The switch 55 is provided with a closing coil 60 and a release coil 61 connected to the "on" and "off" individual control switches 62 and 63, respectively. If desired, each of the operating magnets of the switch 55 may be provided with two windings as shown, one of which is controlled by the individual control switches 62 and 63, and the others by master control switches 65 and 67. The switch 56 is operated by the coils 70 and 71 when the individual control switches 72 and 73

are closed as well as by the closure of the master control switches 65 and 67. Likewise the switch 57 is operated by the coils 80 and 81 upon the closure of either the individual control switches 82 and 83 or the master control switches 65 and 67. In a system of this character, since the control switches are of the simple push-button type and the control circuits carry only a low voltage (10-20 volts), additional switches may be installed at convenient locations at negligible additional expense. Among other variations may be mentioned the possibility of using portable switches which may be connected to extension cords plugged into wall or baseboard receptacles for use by invalids or for greater convenience under any circumstances. Arrangements of this character where the switch directly controls the lighting circuit as in the conventional lighting system are neither inexpensive nor safe, since the high voltage conductors may become exposed after a comparatively short time.

Another system embodying certain features of the invention is shown in Fig. 3, wherein the sets of lamps 85, 86, 87 and 88 are adapted to be controlled by the individual control switches 90, 91, 92 and 93, respectively. The switches 91, 92 and 93 differ from the switch 90 in that when they are thrown to the "off" position, or to the right as shown in the drawing, the associated lamps are connected to an auxiliary supply circuit conductor 89 adapted to complete the circuits of said lamps through a remote-control switch 94. Thus when the switch 94 is closed, any of the lamps 86, 87 and 98, which are turned "off" at their individual control switches are turned "on." The lamps 85 however are not affected by the master control switch 94. This arrangement is advantageous where the lighting load is heavy or the lamps are widely scattered since the auxiliary circuit conductor 89 does not extend to the various master control stations. The master control switch 94 is provided with a closing magnet 95 and a release magnet 96 connected to the master control stations, of which one is represented by the push-buttons 97 and 98, and another by the push-buttons 97a and 98a.

Various other modifications of the invention will occur to those skilled in the art and may be made without departing from the scope of the invention as indicated in the appended claims. The claims of the present application are directed to a system including remote-control or electromagnetic switches, broad claims being embodied in my copending application, Ser. No. 265,480, filed April 1, 1939.

I claim:

1. An electric lighting system comprising lamps or sets of lamps for lighting different areas, a supply circuit, switches for individually connecting said lamps or sets of lamps to said supply circuit, an auxiliary supply circuit to which certain of said lamps or sets of lamps are connected by their associated switches when the same are disconnected from said first-mentioned supply circuit, and electrically controlled means including manually operable master control switches and an electro-responsive switch operatively associated therewith, and with said auxiliary supply circuit to turn "on" and "off" as a group the lamps which are connected at any moment to said auxiliary supply circuit by said first-mentioned switches.

2. An electric lighting system comprising lamps or sets of lamps for lighting different areas, a supply circuit, a plurality of individual control

switches for individually controlling the connection of the lamps or sets of lamps to said supply circuit, electro-responsive switch means for group control of said lamps and means including said electro-responsive switch means and a common control circuit having convenient control points whereby the lamps that are turned "on" at any one of the convenient control points on said common control circuit can be extinguished from the same or any other control point on said control circuit.

3. An electric lighting system comprising a supply circuit, lamps or sets of lamps for lighting different areas, individual control switches one for each lamp or set of lamps, remote-controlled electro-responsive switch means for turning "on" or "off" as a group those lamps or sets of lamps which have been turned "off" by said individual control switches without affecting the lamps or sets of lamps which are "on", and manually operable master control switches arranged to control said electro-responsive group switch means to light said group of lamps from any one of two or more convenient points and then extinguish the same from any one of said points.

4. An electric lighting system comprising a supply circuit, lamps or sets of lamps for lighting different areas, individual switch means for individually controlling the connection of the lamps or sets of lamps to said supply circuit, a second circuit extending to certain of said individual switch means, an electro-responsive master control switch operatively as-

sociated with said second circuit, means including said second circuit and master control switch for simultaneously controlling as a group the lamps associated with said certain individual switch means and means whereby the operation of said group control means is dependent upon the positions of said certain individual switch means whereby the effectiveness of said group control depends upon the positions of the individual switch means.

5. An electric lighting system comprising lamps or sets of lamps for lighting different areas, a supply circuit, a parallel control circuit, a plurality of switches for controlling the connection of said lamps to said supply circuit, each of said switches being provided with an actuating coil connected to said parallel control circuit for opening the switch, and means including said control circuit for simultaneously energizing said coils to extinguish the lamps which have been manually turned "on."

6. An electric lighting system comprising lamps or sets of lamps for lighting different areas, a supply circuit, switches for controlling the connection of said lamps or sets of lamps individually to said supply circuit, each of said switches embodying manually operable and electro-responsive elements whereby the same are both manually and automatically operable, and means including a second circuit extending to certain of said switches for simultaneously actuating said last-mentioned switches.

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