Nov. 3, 1964 A. J. PARISSI ETAL 3,155,957

SIGNALING SYSTEM

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FIG. 1.

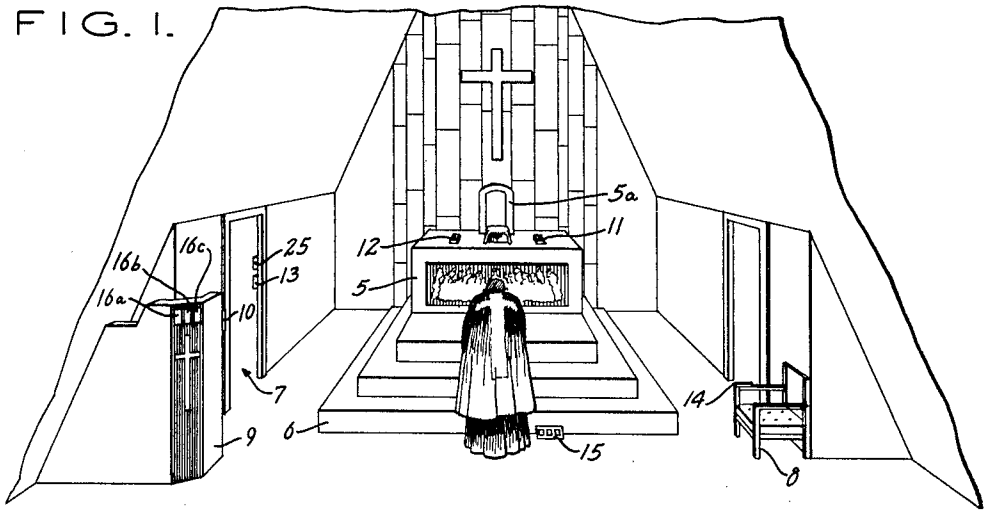
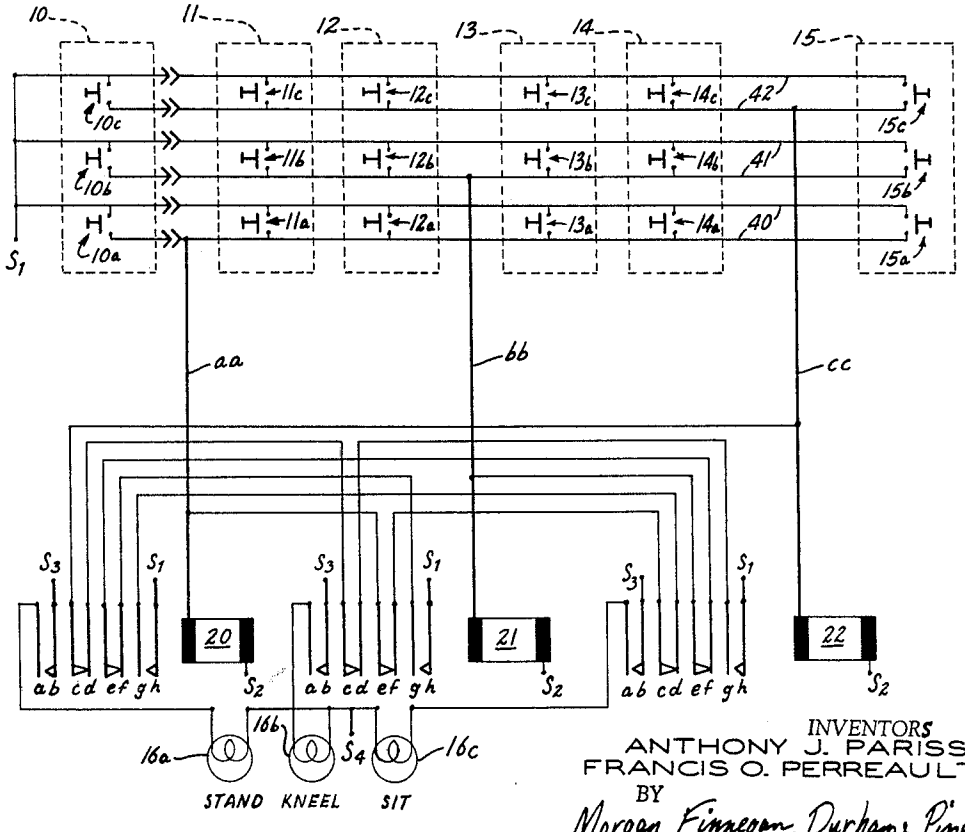


FIG. 2.



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FIG. 3.

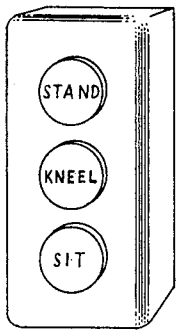


FIG. 4.

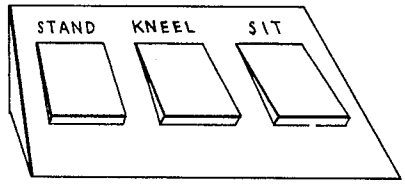


FIG. 5.

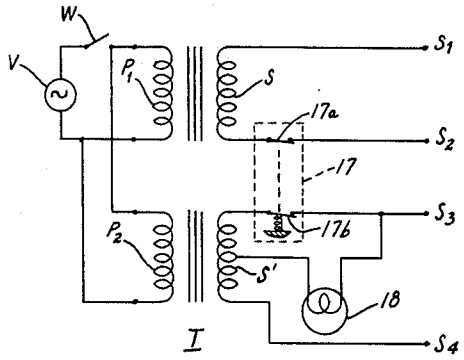
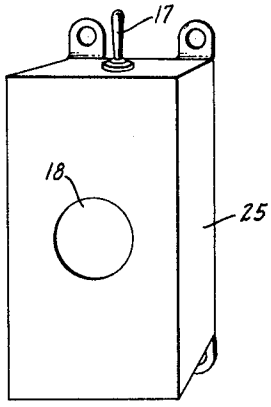


FIG. 6.



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SIGNALING SYSTEM

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10 Claims. (Cl. 340—286)

This invention relates to a signaling system and particularly to a system for signaling commands to audiences, congregations and the like. Many ceremonies involve considerable audience participation. Members of the congregation attending Sunday services, weddings and funerals are required to sit, stand and kneel at various stages of the ceremony. Whether the reason be inattention, procedural complexity, distractions or simple ignorance, there is no doubt that procedural participation at most ceremonies and rites leaves much to be desired particularly in the participant's lack of synchronism. Moreover, the demands placed on the participants in a rite to sit, stand and kneel at precise stages is in itself distracting since speculation on the proper posture detracts from full mental participation in the ceremony.

The invention accordingly contemplates a signaling system which will obviate the above-described difficulties. Such a system involves the requirements that indicators be provided to signal the congregation to assume the correct posture and the further requirement that these indicators be controlled by the celebrant from anyone of a plurality of stations. The latter requirement avoids the need for a special signaling operator.

Illuminated signs directing a group to perform certain acts have been utilized in the past, but these arrangements have suffered from a number of significant defects.

In one case, the signaling system can only be actuated from a single control station. In another case a signal can be controlled from a number of stations but has only two conditions, either "On" or "Off." Other systems provide multiple indications from a plurality of sources but special arrangements in the control switches such as solenoids, detent mechanisms and the like are required so that control over the indicators is properly transferred to the operated station while the stations unused for the instant are disabled. These systems are complicated, expensive and bulky, frequently requiring extensive cabling. This cabling complicates the installation procedure and in some cases is completely unacceptable in that it impairs the aesthetic appearance of the altar, pulpit, platform or the like.

It is accordingly an object of the invention to provide a system for selectively signaling audiences, congregations and the like from any one of a plurality of control stations.

Another object of the invention is to provide such a signaling system in which the signaling switches are of a simple nature and devoid of complicating ancillary equipment such as lock-in solenoids and the like.

A still further object of the invention is to provide a signaling system of the character described in which any one of three or more indications may be transmitted from any one of a plurality of control stations regardless of the previous condition of any of the control stations.

An additional object of the invention is to provide such a signaling system which is characterized by a simple circuit arrangement of inexpensive, safe and reliable components.

A still further object of the invention is to provide a signaling system whereby the celebrant at a religious ceremony may transmit procedure commands to the congregation from any one of a plurality of stations.

Another object of the invention is to provide a signaling system of the character described having means for correcting erroneous commands and means for resetting the system to a reference condition.

These and other objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

Briefly and generally the system according to the invention comprises a plurality of physically separated control stations, a plurality of indicators and a circuit arrangement interconnecting the stations and indicators, the circuit including a plurality of multi-contact relays, together with energizing networks, relay energizing means and a plurality of hold-transfer circuits whereby actuation of a particular switch at a particular station causes operation of the corresponding indicator and at the same time cancels control operations previously instituted at the same or any of the other stations. The invention also provides means for correcting erroneous commands and means for resetting the system to a reference condition.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

Serving as illustrations of an exemplary embodiment of the invention are the drawings, of which:

FIGURE 1 is a perspective view illustrating the installation of the system of the invention in a church;

FIGURE 2 is a schematic diagram of a circuit for operating the signaling indicators from any one of the control stations;

FIGURE 3 is a perspective view illustrating one of the control switch arrangements at certain of the control stations;

FIGURE 4 is a perspective view illustrating a control switch arrangement employed at the foot of the altar;

FIGURE 5 is a schematic diagram of the circuit of a multiple voltage power source which may be employed in conjunction with the system of FIGURE 2.

FIGURE 6 is a perspective view illustrating the resetting and pilot indicator means.

Employment of the system of the invention is illustrated in FIGURE 1 in a church comprising an altar **5** surmounting altar steps **6** and accessible from sacristy entrance **7**. The altar includes a tabernacle **5***a* a chair **8** and a pulpit **9** are also included in the church arrangement. At the pulpit **9** there is provided a control station **10** illustrated in more detail in FIGURE 3. Similar stations **11** and **12** are provided at the epistle and gospel sides of the altar, respectively, while stations **13**, **14** and **15** are mounted adjacent sacristy entrance **7**, on chair **8**, and at the foot of altar **5**, respectively. The latter station comprises a switch arrangement as illustrated in FIGURE 4.

The pulpit control station **10** is conveniently provided with three control switches **10***a*, **10***b* and **10***c* and, like switches at the other control stations, these serve to control respective indicator lamps **16***a*, **16***b* and **16***c*. The lamps in conjunction with corresponding indicia, "Stand," "Kneel" and "Sit" respectively, or by a color code, serve to direct the members of the congregation in the proper procedures. The control stations **11–15** are similar to station **10**, being provided with respective switches **11***a*, **11***b*, **11***c*; **12***a*, **12***b*, **12***c*, etc.

The switches **10***a*, **10***b*, **10***c*, **11***a*, etc., are of the momentary, nomally-open type. By appropriate cabling the switches of stages **10–15** and the indicator lamps **16***a*, **16***b*, **16***c* are connected to form a signaling system circuit as illustrated in FIGURE 2.

As seen in FIGURE 2, the switches in group "*a*," viz., **10***a*, **11***a*, **12***a*, . . . **15***a* at the respective station **10–15**

are connected in parallel by a network of leads 40. Other networks which include additional lead pairs 41 and 42, serve to respectively connect in parallel "b" switches 10b, 11b, 12b, . . . 15b, and "c" switches, 10c, 11c, 12c, . . . 15c, at the respective stations 10–15. Any switch in the "a," "b" and "c" switch groups operates the respective indicators 16a, 16b, and 16c by means of the arrangement described below.

Each switch group "a," "b" and "c" of the networks 40, 41 and 42 provides a particular indication and there is accordingly associtated with each group a multi-contact relay 20, 21 and 22, respectively, of the A.C. type. This association is reflected in the connection of relays 20, 21 and 22 to the respective switch groups "a," "b" and "c" via the leads aa, bb and cc which are connected respectively to one lead of each network 40, 41 and 42 and to one terminal of the respective field of each relay 20, 21 and 22. The other terminal of each relay field is connected to power source terminal S_2 while the other lead in each network group 40, 41 and 42 is connected to power source terminal S_1.

It may be seen from the foregoing that each energizing circuit aa, bb and cc serves to place the corresponding switch group "a", "b" and "c" in series with the associated relay 20, 21 and 22 and in series with the power source defined by terminals S_1 and S_2. By this arrangement, actuation of a switch in any group energizes the associated relay. Thus, actuation of switch 11c in network 42 results in the flow of current from terminal S_1 through one lead of group 42, through switch 11c to the other lead of group 42, thence via lead cc to relay 22 and to return terminal S_2. Analogous circuits may be traced from the other switches to the respective relays.

Operated by relay 20 are four pairs of contacts 20a–b (normally open), 20c–d (normally closed), 20e–f (normally closed) and 20g–h (normally open). The other relays have similar contact arrangements. Contact 20h in the last named pair is connected to power terminal S_1, while companion contact 20g is connected in series with normally-closed transfer contacts 22c–d of relay 22, which contacts are serially connected in turn with normally-closed transfer contacts 21e–f of relay 21. (All elements of FIGURE 3 are shown in their deenergized states.) This hold-transfer circuit, comprising the series combination of holding contact pair 20g–h and transfer contacts 22c–d and 21e–f, connects one terminal of the field of relay 20 to terminal S_1 of the power source, provided relay 20 is energized and relays 21, 22 are deenergized.

It is evident from the above that this hold-transfer circuit is effectively in parallel with the energizing network comprising network 40 and the "a" group of switches. The relay is accordingly maintained in an energized state after its momentary energization by any of the related switches in the "a" group until the switch of another switch group is energized. In this event one pair of the normally-closed contacts 22c–d or 21e–f is opened by virtue of the momentary operation of one of the other relays 21 or 22, thus breaking the transfer-hold circuit of relay 20 and causing deenergization of the latter. The trasfer-hold circuit 21g–h, 20e–f and 22e–f, or 22g–h, 21c–d and 20c–d of the newly-operated relay 21 or 22, now functions to maintain that relay in the actuated state. It may be seen from the foregoing that the transfer action accompanies the operation of any switch in a switch group different from the group embodying the previously-actuated switch. This action may be initiated from a new station or by operation of a different switch at the same station.

Operation of a particular relay 20, 21 or 22 results in operation of the associated normally-open indicator contacts 20a–b, 21a–b or 22a–b. The energized pair serially connects the power source defined by terminals S_3, S_4, and the associated indicator 16a, 16b or 16c, thereby energizing the selected one of the latter. Thus, operation of relay 22 results in closure of contacts 22a and 22b and actuation of indicator 16 from source S_3, S_4, the terminal S_3 being connected to contact 22b and the terminal S_4 being connected to lamp 16c. An analogous arrangement is provided for each of the other indicators.

For providing a source of current for energization of the system described above, a circuit such as illustrated in FIGURE 5 may be used. Thus a transformer T is provided having a pair of parallel-connected primary windings P_1 and P_2. These windings are energized from power source V, e.g., the 60 cycle/115 volt commercial mains, via a switch W that serves to turn the entire system on and off by energizing and deenergizing transformer T. On the core of transformer T are two secondary windings S and S'. In the preferred embodiment these windings each provide a stepdown voltage of approximately 6 volts. Winding S is connected via the conact 17a of a switch 17 to the terminals S_1 and S_2. Secondary winding S' is connected via the contact 17b of switch 17 to the terminals S_3 and S_4. The terminals S_1–S_4, as described hereinbefore, connect to the corresponding points of the system circuit as indicated in FIGURE 2.

Connected from terminal S_3 to a tap on winding S' is an indicator lamp 18, which is energized whenever switches W and 17 are closed. The installation of switch 17 and indicator 18 in a suitable control box 25 is illustrated in FIGURE 6 while the installaiton of the control box adjacent sacristy entrance 7 is illustrated in FIGURE 2.

It may be observed from FIGURE 5 that with the main power switch W in its closed position, transformer T is energized. However, if switch 17 is moved to its open position, then the relays 20, 21 and 22 will be deenergized and the corresponding indicators 16a, 16b and 16c will be extinguished. Accordingly, switch 17 serves as reset means which may be operated at an appropriate time to cancel whatever indication last prevails. With switch 17 in its open position, the contacts 17a and 17b are both open. Accordingly, in addition to deenergization of relays and indicators, pilot indicator 18 is also extinguished, thereby serving as a warning that the signaling system is temporarily inoperative. The switch is closed prior to the celebrant's entry to the altar through the sacristy entrance.

An example of operation of the system is provided, it being understood that in general the sequence is completely variable and dependent upon the nature of the rites performed.

Assuming the celebration of a Roman Catholic mass, the priest as he enters through sacristy entrance 7 actuates switch 13a at control station 13, thereby energizing "Stand" lamp 16a to signal the congregation to rise. After arranging the gospel book and placing the chalice on the altar, the priest actuates switch 15b at control station 15, thereby energizing the "Kneel" lamp 16b which signals the audience to kneel in preparation for the prayers at the foot of the altar. The congregation remains in the kneeling position through the "Prayers," the "Introit," the "Gloria," the "Collect" and the "Epistle." At the conclusion of the "Epistle" the celebrant actuates switch 12a at control station 12, in which event the "Stand" lamp 16a is energized signaling the audience to rise for the first recitation of the "Gospel."

At the conclusion of the "Gospel," the priest actuates switch 12c at control station 12 thereby energizing the "Sit" lamp 16c. The members of the congregation in response take their respective seats while the priest goes to the pulpit. After the usual announcements and just before the reading of the "Gospel" in English, the priest actuates control button 10a at control station 10 thereby signaling the congregation to stand. At the conclusion of the English recitation of the "Gospel" the priest may signal the congregation to sit or kneel by actuation

of the appropriate switch at control station **10** or, depending on the particular procedure practiced, he may go to the foot of the altar for the "Nicene Creed," in which event the congregation remains standing.

At the commencement of the "Offertory" the priest actuates switch **11***c* at control station **11** thereby signaling the congregation to sit. After the "Preface" and at the instant of the "Sanctus" the priest actuates switch **11***b* at control station **11** thereby signaling the congregation to kneel.

The method of operating the system according to the invention should be clearly evident from the foregoing example. The remaining operations corresponding to the terminal part of the mass will therefore not be described. After the mass is over, and as the priest leaves via sacristy entrance **7**, reset switch **17** is actuated thereby momentarily deenergizing the last-energized relay and extinguishing its associated indicator. The switch is spring returned to its normal position whereby the system is reset to the ready condition with all the indicators deenergized and the relays in readiness for energization upon actuation of a switch at the appropriate station.

If, during the service, the priest should inadvertently actuate the wrong control switch, this action may be canceled and the correct indicator signaled either by the priest at any station or by a monitor who operates the desired switch at control station **13**.

It will be evident in practicing the invention that a number of variations may be employed in accordance with the particular requirements associated with the use of the signaling system. Thus, the indicators **14** may include oral effects such as chimes or may employ illuminated lettering techniques. Moreover, the number of switches at any particular control station may be varied as illustrated, for example, by control station **13** of FIGURE 3 which employs but one switch, **13***a*.

Other modifications to the invention may include means for interrupting the indicators **14** so that they are operated for a relatively short period of time. Time delay relays and the like may be employed for this purpose.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What is claimed is:

1. A system for selectively signaling audiences and the like from different locations comprising a plurality of station means, indicating means having a plurality of indicators representing respective commands, momentary switching means at each station means having a plurality of contacts associated respectively with each of said indicators, a network, the contacts associated with a particular indicator at one station means being connected by said network to like contacts at said other station means, multi-contact relay means associated with each of said indicators, a source of current, energizing circuit means interconnecting each of said relay means with the associated network and said source of current, indicator contacts on each of said relay means interconnecting, when energized, the respective indicator and said source for energizing the respective indicator, holding contacts on each of said relay means, transfer contacts on each of said relay means, transfer-hold circuit means allocated to each of said relay means comprising the holding contacts on said relay means and transfer contacts on said other relay means connected to said holding contacts, said transfer-hold circuit means interconnecting the selected relay means and said source of current for holding said relay means energized when said relay means is momentarily energized from the respective network by operation of the respective switch contacts at the operated station means, said hold-transfer circuit means of said other relay means being conjointly deenergized by energization of said transfer contacts on said selected relay means.

2. A system according to claim 1, in which each of said networks comprise the parallel connection of pairs of like contacts at each station and means associated with each pair for connecting the same.

3. A system according to claim 1, in which said holding contacts comprise a pair of normally open contacts on each of said relay means.

4. A system according to claim 1, in which said transfer contacts comprise normally closed contacts on said relay means.

5. A system according to claim 1, in which each of said hold-transfer circuit means comprise normally closed holding contacts on the associated relay means serially interconnected with normally open contacts on said other relay means.

6. A system according to claim 1, in which each of said energizing circuit means connects the associated relay means across the series combination of said source and said switches of the respective network.

7. A system according to claim 1, in which said momentary switching means comprise a plurality of momentary push button switches each having a pair of said contacts.

8. A system according to claim 1, in which each said energizing circuit means serially interconnects said relay means, said associated network and said source of current.

9. A system according to claim 1, in which said source of current includes a reset switch for deenergizing the residually energized relay means, said switch being of the momentary type.

10. A system according to claim 9, in which a pilot indicator for indicating the readiness of the system for operation is provided, said indicator being normally energized via said reset switch.

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