

Sept. 22, 1936.

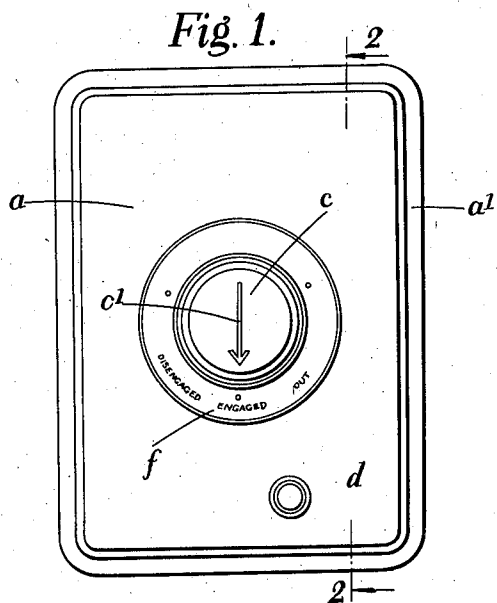
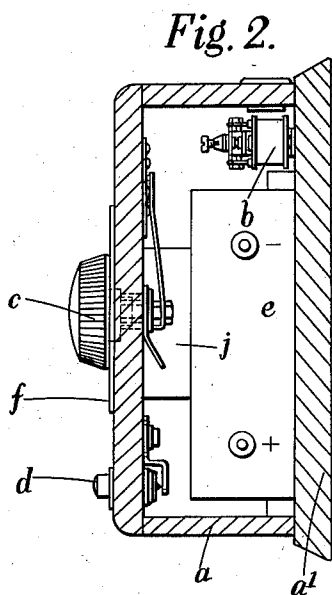
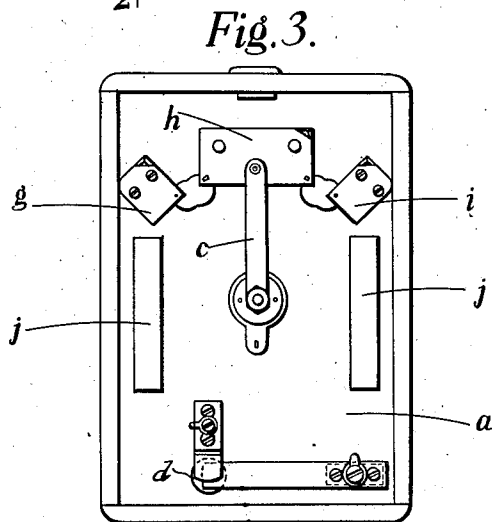
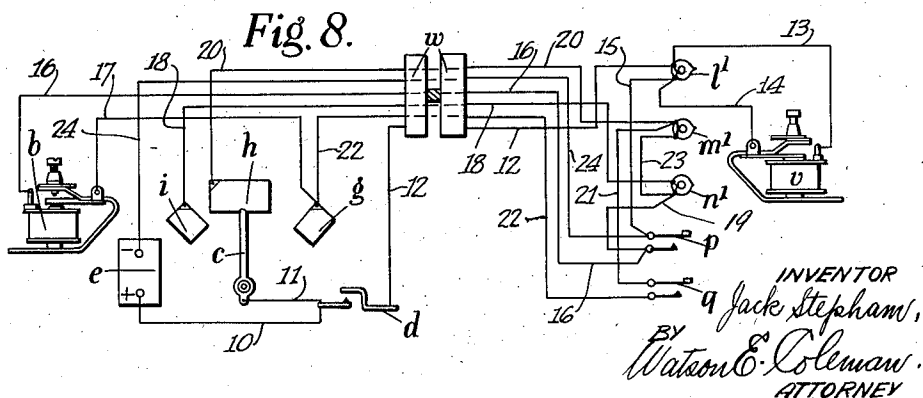
J. STEPHAM

2,054,955

ELECTRICAL SIGNALING AND INDICATING MEANS

Filed Oct. 19, 1934

2 Sheets-Sheet 1



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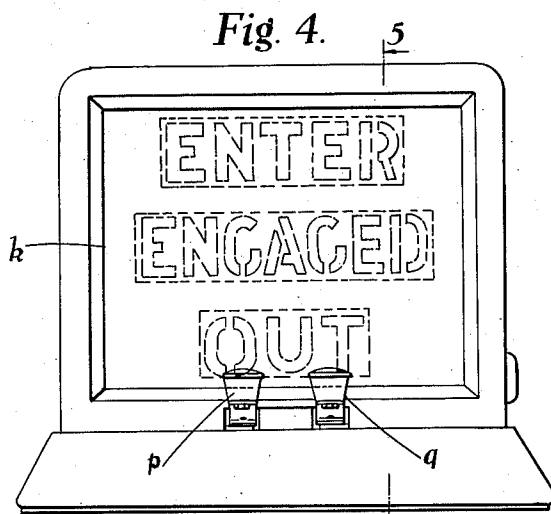
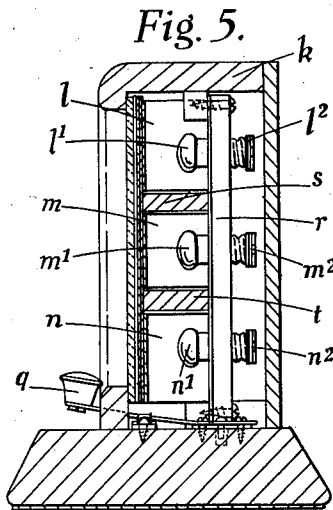
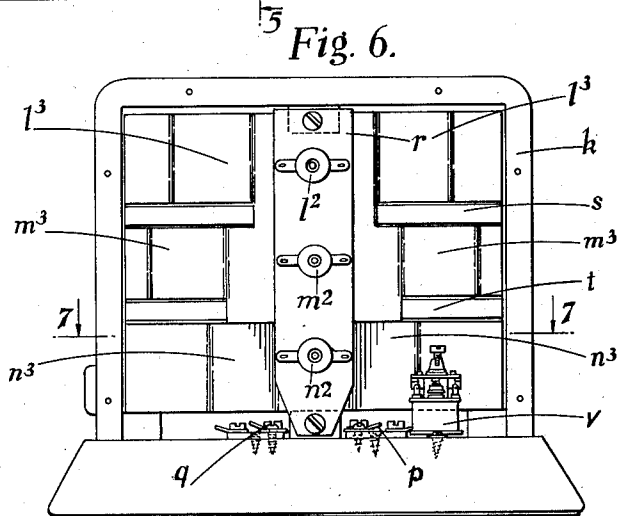
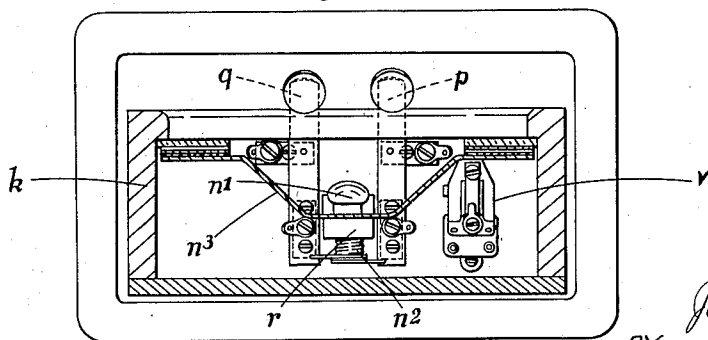
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ELECTRICAL SIGNALING AND INDICATING MEANS

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2 Sheets-Sheet 2



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ELECTRICAL SIGNALING AND INDICATING
MEANS

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Application October 19, 1934, Serial No. 749,115
In Great Britain October 19, 1933

4 Claims. (Cl. 177-339)

In order to enable a person calling upon the occupant of a room, office or apartment, or the clerk of the occupant to apprise the occupier of his desire to enter and at the same time receive an intimation as to whether the occupier is for the time being "engaged", "disengaged" or "out" electrical signaling and indicating apparatus have already been devised. Such apparatus has usually comprised, externally of the room, a compartmented indicator box having a press button and a series of electric lamps adapted when the press button is actuated to illuminate one of a number of texts such for example as "engaged", "disengaged" or "out" according to the particular setting of a multi-way switch located within the room, said switch being under the control of the occupant and associated with a signal device responsive to the press button outside.

The present invention which concerns signaling and indicating apparatus of the kind just mentioned has for its object to provide an improved combination of components so arranged as to furnish a compact, simple and efficient appliance with which two-way signaling can be effected positively and visual indications given to a caller or attendant as to the condition of the occupant whether "engaged", "disengaged" or "out". It is also an object of the invention to provide such an apparatus wherein the actuation of a signal within the room of occupant will normally be suppressed in the event of the occupant being "engaged", supplementary means being also provided whereby such a signal can however be transmitted in the event of circumstances rendering it desirable or imperative.

The invention is hereinafter more fully described with reference to the accompanying drawings, wherein:—

Fig. 1 is a plan view of one of the fittings comprised in the improved arrangement for indicating and signaling.

Fig. 2 is a transverse section of the same taken on the line 2—2 in Fig. 1.

Fig. 3 is an inverted plan view of the case with the base detached in order to show certain internal parts.

Fig. 4 is a front elevation of the indicator fitting comprised in the arrangement.

Fig. 5 is a transverse section of the same taken on the line 5—5 in Fig. 4.

Fig. 6 is a rear elevation of the same with the back removed and Fig. 7 is a sectional plan taken on the line 7—7 indicated in Fig. 6.

Fig. 8 shows diagrammatically the various parts included in the installation and the manner in which they are interconnected electrically.

The arrangement illustrated in these drawings may of course be usefully applied in many different situations but for convenience in description it is proposed to consider the installation as one applied for signaling between an occupant hereinafter called the principal, and his secretary, hereinafter called the attendant. The fitting shown in Figs. 1 to 3 inclusive is located within the principal's room whilst the apparatus shown in Figs. 4 to 7 inclusive is located in the attendant's quarters.

Referring now to Figs. 1 to 3 of the drawings it will be seen that the principal's fitting comprises a casing *a* of wood or other suitable material, which encloses an electro-magnetic buzzer *b* or bell, a three position selector switch *c*, a press button switch *d*, and if desired a dry battery *e* constituting the source of energy for operating the installation.

An indicating plate *f* affixed externally of the casing *a* and bearing markings such for example as the words "disengaged", "engaged" and "out" is arranged to co-act with an index mark *c'* on the operating knob of the selector switch *c* in showing the various active positions of the latter. The selector switch *c* which in its three operative positions engages one or other of three contact plates *g*, *h*, *i* and the press button switch *d* may for convenience be mounted in the top wall of the casing *a* as shown while the buzzer *b* may be affixed to the base *a'* of the casing which is preferably removable to enable the battery to be replaced by a new one when necessary, said battery being held in position between the base *a'* and two fixed blocks *j j* which latter serve also to limit the angular motion of the selector switch arm.

This combination of components is connected through a multi-way cable in the manner indicated diagrammatically in Fig. 8 to a complementary appliance as shown in Figs. 4 to 7 provided for the use of the attendant. This latter appliance comprises a glass fronted casing *k* divided internally into three superposed com-

partments *l*, *m* and *n*, each of which is occupied by a miniature electric lamp, *l*¹, *m*¹, and *n*¹, adapted to give a distinctive indication as for example by illuminating an indicative marking cut in a stencil plate arranged behind the glass front. For the purpose in question it will be found convenient if the lamps be arranged to illuminate and display separately on the glass front the words "enter" "engaged" and "out" respectively. For this purpose a stencil sheet with appropriate lettering cut in it may be disposed behind the glass front of the casing *k*, a sheet of thin white paper or like material being interposed between the stencil and the glass to render the indicia invisible except when illuminated from behind.

The lamps may for convenience be supported in holders *l*², *m*², *n*², mounted upon a common batten *r* which is secured within the casing to the rear of two partitions *s* and *t* which separate the adjacent compartments one from another. Moreover, the separate compartments may be closed at the rear by reflecting walls *l*³, *m*³ and *n*³, composed of white card or other appropriate material.

The casing also contains an electro-magnetic buzzer or bell *o* and two press button switches *p* and *q* hereinafter referred to as primary and secondary push buttons respectively, these being adapted and arranged for manipulation as later described. For convenience in use each of the two casings mentioned is connected by way of a multi-wire flexible conductor (not shown) to a wall box or plate indicated at *w* in Fig. 8, and the two appliances are connected together by a cable extending between these wall boxes or plates. It should here be mentioned that the connection between the appliances may in some cases be permanent whereas in other instances, as for example where a single attendant waits upon two or more principals, it may be more convenient to introduce a system of change-over switches or plugs and jacks to enable the connections to be modified as and when required.

Fig. 8 shows clearly the electrical connections made between the various components comprised in a system, the parts on the left-hand side of the diagram being those included in the principal's appliance whereas those on the right-hand side of the diagram represent those included in the attendant's appliance.

It will be seen from Figure 8 that one element of the push button switch *d* is connected by wire 10 to the battery *e* and by the wire or conductor 11 to the selector switch arm *c*, this arm *c* being thus connected to the positive pole of the battery. The other element of the switch *d* is connected by wire 12 through the wall box *w* and cable to one electrode of lamp *l*¹ which indicates the word "enter" and this wire 12 is connected by wire 13 to the buzzer or audible signal *v*, the other side of the buzzer *v* being connected by wire 14 to the other electrode of lamp *l*¹. This electrode of lamp *l*¹ is connected by a wire 15 to one element of the switch *p* and by wire 24 to the negative terminal of battery *e*. The contact *i* is connected by wire 18 to the lamp *n*¹ (indicating "out") which lamp is connected by wire 19 to one element of the switch *p*. The contact plate *h* is connected by wire 20 to one side of the lamp *m*¹ (indicating "engaged") and by wire 21 to one element of the switch *q*, the other element of the switch *q* being connected to contact plate *g* by a wire 22 and thence to the buzzer *b* by wire 17. The lamps *m*¹ and *n*¹ are connected in series by a wire 23. From the junction of wire 15 with switch *p* ex-

tends a return wire 24 which leads to the negative pole of the battery *e*. The other pole or point of switch *p* is connected by wire 16 to one side of buzzer *b*, the other side of the buzzer *b* being connected by wire 17 to contact *g*.

In the operation of this signaling mechanism, we will presume that the principal is either "engaged" or "disengaged", that consequently, he has set the switch arm *c* on contacts *h* or *g*. Assuming the selector switch *c* is on contact *h*, then if the principal wishes to call the attendant or clerk, he presses the button *d*. A circuit will then be completed from the battery *e* through switch *d* by wires 12 and 13 to the buzzer *v*, by wires 14 and 15 to one point of the switch *p* and back by wire 24 to the battery *e*. The same circuit will be completed if the switch arm *c* be on the contact *g*. Thus the principal can communicate with the clerk in the other room by the buzzer *v* whether the switch arm *c* is on contact *h* or on contact *g*.

Presuming that the principal is "disengaged" and wishes to indicate to the clerk that he is disengaged in case a caller comes in or in case the clerk desires to communicate with him, the principal sets the switch arm *c* on contact plate *g*. Now if the clerk desires to introduce a caller or see the principal himself, he closes switch *p* which closes the circuit from the negative pole of the battery by wire 24 through wire 16 to the buzzer *b* and through wire 17 to the contact *g* and from contact *g* through contact arm *c* to the positive pole of the battery through return wire 24 and back to the switch *p*. This energizes the buzzer *b* and thus gives an audible signal to the principal that someone desires admission. Now if the principal is willing to have the caller or clerk admitted, he presses button *d* which closes the circuit from the battery through wire 12 to lamp *l*¹, (illuminating the word "enter") thence to switch *p* which the clerk is holding depressed, and back to the battery by conductor 24.

Presuming that the principal is engaged, he places the switch arm *c* on contact plate *h*. If now the clerk closes the switch *p*, the buzzer *b* does not sound because the circuit through the buzzer is open at switch *q*, but the closing of switch *p* closes the circuit from battery *e* through conductors 10, 11, switch arm *c*, plate *h*, wire 20 to lamp *m*¹ (illuminating the word "engaged") through wires 23 and 19 through closed switch *p* and back through the wire 24 to the battery. Thus, the word "engaged" is displayed upon the indicator but the principal is not annoyed by the sounding of any buzzer or by any indication that a caller is waiting.

If now the clerk, notwithstanding that the principal is engaged, wishes to call the attention of the principal to the fact that an important caller is waiting who should be seen, if possible, he not only holds switch *p* depressed or again depresses switch *p*, but he also simultaneously depresses or closes switch *q* and this closes the circuit through the buzzer *b*, which circuit includes the battery, wires 10 and 11, switch arm *c*, plate *h*, wire 20, wire 21, switch *q*, wires 22 and 17, through the buzzer and by wire 16 to closed switch *p*, and then by wire 24 back to the battery, thus causing the buzzer to sound.

If now the principal is about to leave the office, he shifts contact *c* to the plate *i*, then if the clerk closes the switch *p*, a circuit is completed from the battery *e* to switch arm *c* to contact *i* by wire 18 to the lamp *n*¹ (which illuminates the

word "out") by wire 19 to switch *p* and back by wire 24 to the battery.

In consequence of the arrangement of the connections the following effects are obtained. Regardless of the positions occupied by the selector switch *c*, depression of the principal's push button switch will operate the attendant's buzzer or bell *v* and at the same time light the lamp *l* rendering visible the indication "enter". The selector switch *c* on the principal's appliance is however intended to be pre-set in one of its three positions according to whether he is for the time being disengaged, engaged or out, and although the setting of this switch does not itself give rise to any noticeable effects it serves to ensure the required indications being obtained at the attendant's appliance when the primary push button *p* thereon is depressed.

Thus assuming the selector switch is set to the "disengaged" position, in which case its arm will engage the contact plate *g*, and subsequently the primary push button *p* on the attendant's appliance be depressed, this action will result in the principal's buzzer or bell *b* being sounded, whereupon he may signal back to the attendant by depression of his own push button *d* if he is prepared to admit. If, on the contrary, the selector switch *c* be set to the "engaged" position, viz. with its arm engaged with the contact plate *h*, depression of the attendant's primary push button *p* will cause the illumination of the "engaged" indicator by lighting the lamp *m*¹, but will not operate the principal's signaling device *b*. In this way the attendant is at once informed of the principal's engaged condition and without causing any disturbance to the principal. If in these circumstances the attendant in view of the urgency of the matter finds it imperative to signal the principal the secondary push button *q* is depressed simultaneously with the push button *p*, whereupon the "engaged" indication is given to the attendant as already described but the principal's signaling device *b* is also sounded.

When the selector switch *c* is set to the "out" position, viz. with its arm engaged with the contact plate *i*, operation of the attendant's primary push button *p* will merely cause the illumination of the lamp *n*¹, bringing the attendant's "out" indicator into view while the principal's signaling device *b* will remain inoperative.

One of the particularly advantageous features of the arrangement which I have illustrated and described, is that the principal when engaged is not in any way disturbed by audible signals, even though the clerk closes the button switch *p*. Nevertheless, if the clerk realizes the business of the newcomer is urgent and it be imperative that the principal be warned, a ringing signal can be transmitted to the principal by the depression of both button switches *p* and *q* simultaneously. It will be seen that the principal's buzzer, bell or other audible signal is free to be operated by the normal switch key *p* only in the event of the selector switch standing at the disengaged position. When the principal is already engaged, he can be left undisturbed while the clerk, by operating the switch *p* ascertains that this is the case and thus, under ordinary circumstances, callers arriving while the principal is engaged and seeing the word "engaged" displayed, are satisfied and readily induced to wait. Where, however, a caller's business is of sufficient urgency to warrant an interruption, a signal can be transmitted to the principal by the use of both switches *p* and *q* simultaneously.

While I have particularly designed this mechanism to be so used that a clerk or attendant is in charge of the indicator mechanism shown in Figures 4 and 7, yet it is obvious that a caller might, if he is familiar with the system, secure the signal himself without the intermediation of a clerk, and that this system might also be used between an employer and an employee, so that the employee can find out whether the employer is engaged or disengaged or out, or whereby the employer may find out whether the employee is engaged or disengaged or out. Thus, there are many uses to which this signaling system may be put.

It should be remembered that the battery or other source of energy may be located at any point desired without affecting the invention and moreover if desired more than two fittings may be combined in a common system.

Thus for example it may in some instances be convenient to connect fittings in a number of rooms to indicators at a single point or vice versa and in other cases the fittings may be made portable and connected as required to a system of wiring extending throughout the premises where the apparatus is to be used.

I claim:—

1. A signaling apparatus for use between two separate rooms including a signal in one room having a plurality of signs, said signs indicating in effect, respectively, that a party in the other room is engaged, disengaged or out, an attention attracting indicator in the other room, a selector switch in the last named room adapted to be set to prepare a circuit through the lamps of any one of said signs and a source of current, means including a switch in the first named room which when closed completes said circuit through the lamp of the previously selected sign, and means including a second switch in the first named room which when closed at the same time that the last named switch is closed completes a circuit through the attention attracting indicator in the second named room and a source of current, said last named switch being incapable of closing said last circuit unless the other switch in the same room is closed and unless said selector switch is set to prepare that circuit which includes the lamp of the engaged sign.

2. A signaling apparatus for use between two separate rooms including a signal in one room having a plurality of signs, the signs indicating, respectively, that a party in the other room is engaged, disengaged or out, an audible signal in the said first named room, a selector switch in the second room to prepare a circuit through the lamp of any one of said signs, means in the second room for closing a circuit through the audible signal in the first named room without regard to the position of the lamp circuit controlling means, an audible signal in the second named room, means including a switch in the first named room which when closed completes a circuit through the previously selected signal lamp and a source of current to thus cause the display of the previously selected signal, and means including a second switch in the first named room which when closed coincidentally with the last named switch closes a circuit through the audible signal in the second room and a source of current, the second switch of the first named room being inoperative to close said circuit unless the other switch of the first named room has been closed and unless the selector switch

in the second room is closed to prepare that circuit which includes the lamp of the engaged sign.

3. A signaling apparatus for use between an office and an ante-room including a signal unit in the ante-room, the unit including three electrically energized signs, a pair of switches associated with said unit and each including a pair of relatively movable switch points, a selective switch in the office which includes a contact for each sign and a switch blade movable for selective engagement with one or the other of the contacts, a source of electrical potential having one side electrically connected with said blade, a second switch in said office having two relatively movable points, one of which is electrically connected with one side of the source of potential, an electrical connection leading from the other point of the last named switch through one sign to the other side of said source of potential and including one point of one of said pairs of switches, a signal in said office, an electrical connection from one side of the last named signal to one point of the other one of the pair of switches in the ante-room and including in said connection one selector contact, an electrical connection leading from the other point of the said other one of the pair of switches to one side of the second sign and to a second selector switch contact, an electrical connection leading from the other side of said last named signal to and through the other point of the first mentioned one of the pair of switches to one side of a third sign and to the other side of the second sign, and an electrical connection leading from the other side of the third sign to the third selector switch contact.

4. A signaling apparatus for use between an office and an ante-room, including three electrically energized signs in the ante-room, an audible electrically actuated signal element included in said unit which is electrically connected across one sign, a pair of switches associated with said unit and each including a pair of relatively movable points, a selective switch in the other room which includes a contact for each sign and a switch blade movable for selective engagement with the contacts, a source of electric potential having one side electrically connected with said blade, a second switch in said other room having two relatively movable points one of which is electrically connected with said one side of the source of potential, an electrical connection leading from the other point of the last mentioned switch through one sign to the other side of said source of potential and including one point of one of said pair of switches, a signal in said other room, an electrical connection from one side of the last signal to one point of the other one of the pair of switches and including one selector switch contact therein, an electrical connection leading from the other point of the said other one of the pair of switches to one side of a second sign and to a second selector switch contact, an electrical connection leading from the other side of said last signal to and through the other point of the first mentioned one of the pair of switches to one side of a third sign and to the other side of the second sign, and an electrical connection leading from the other side of the third sign to the third selector switch contact.

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