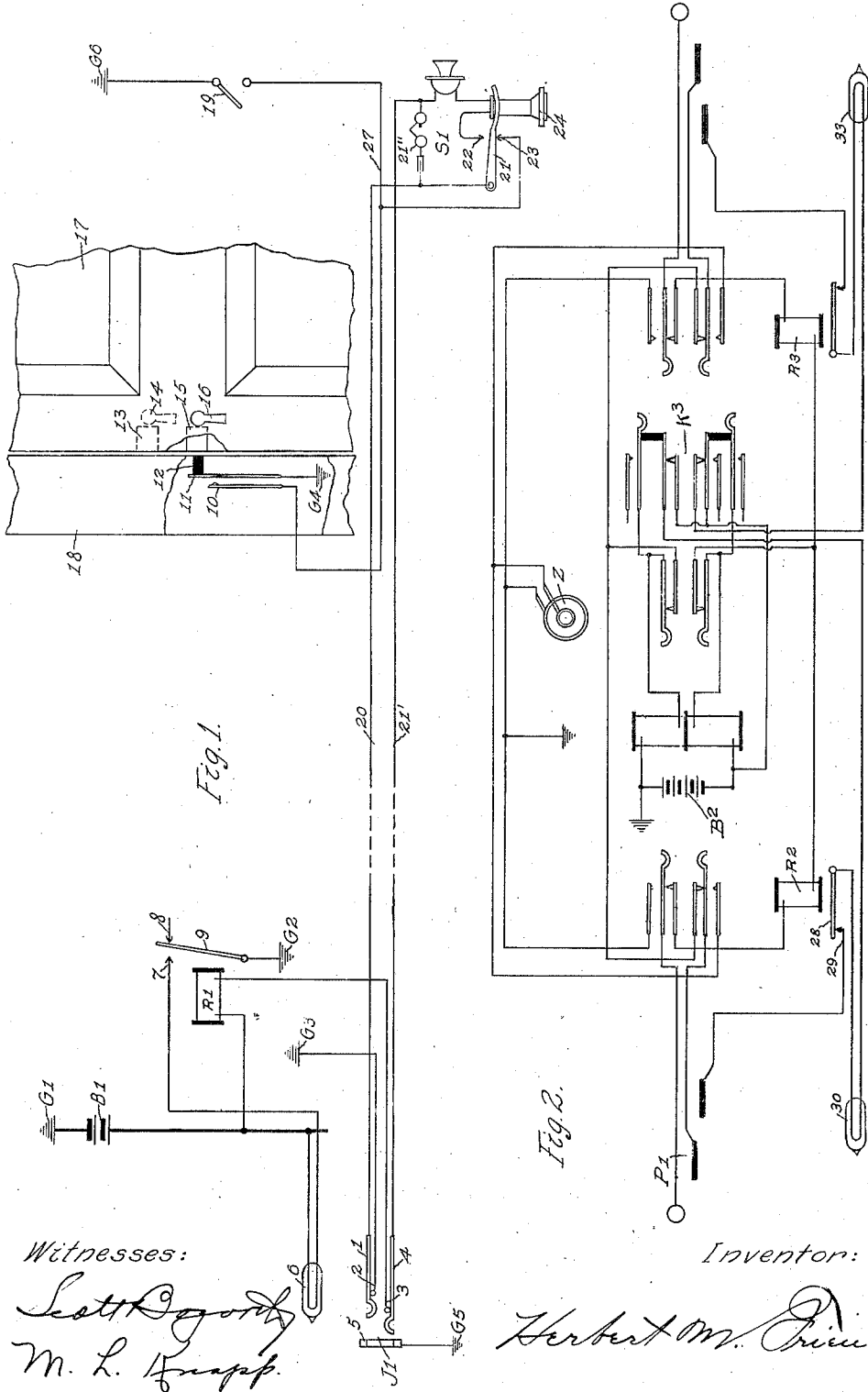


H. M. FRIENDLY,
SIGNAL SYSTEM AND APPARATUS.
APPLICATION FILED NOV. 23, 1915.

1,358,720.

Patented Nov. 16, 1920.

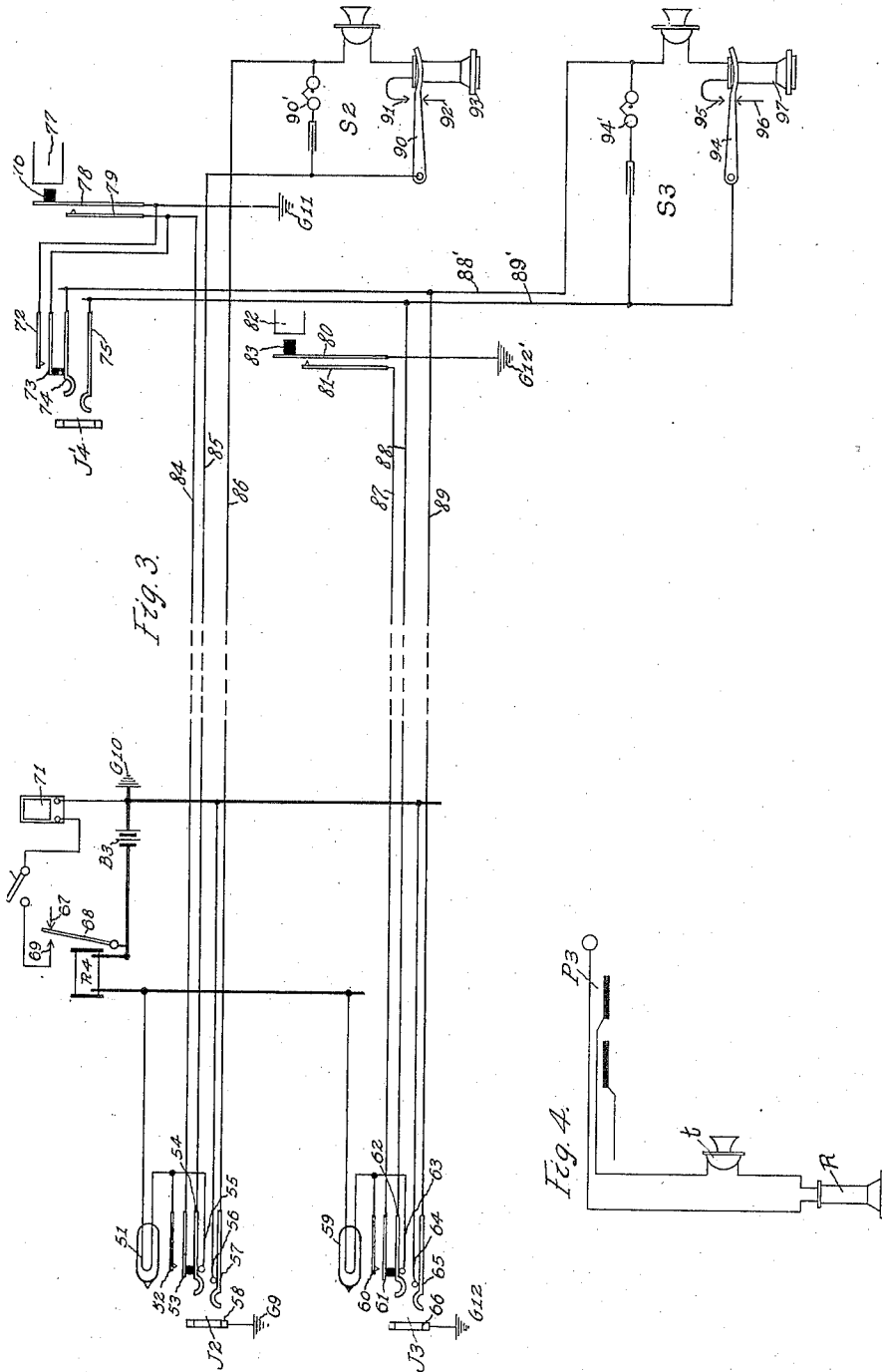
4 SHEETS—SHEET 1.



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4 SHEETS—SHEET 2.



Witnesses:

W. L. Bragg
W. L. Bragg.

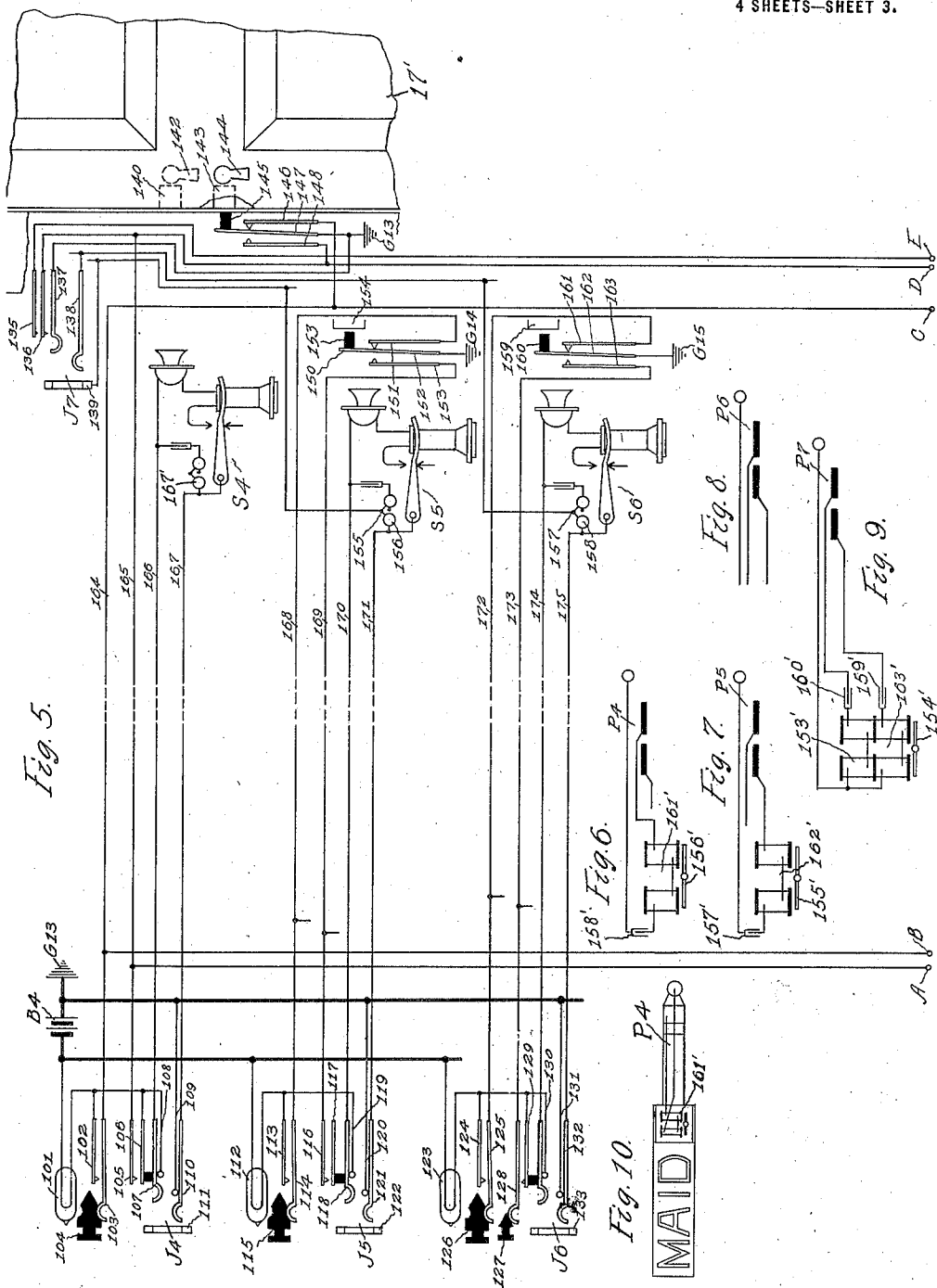
Inventor:

Herbert M. Friendly
Herbert M. Friendly.

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4 SHEETS—SHEET 3.



Witnesses:

Scott D. Boyd
M. L. Knapp

Inventor:

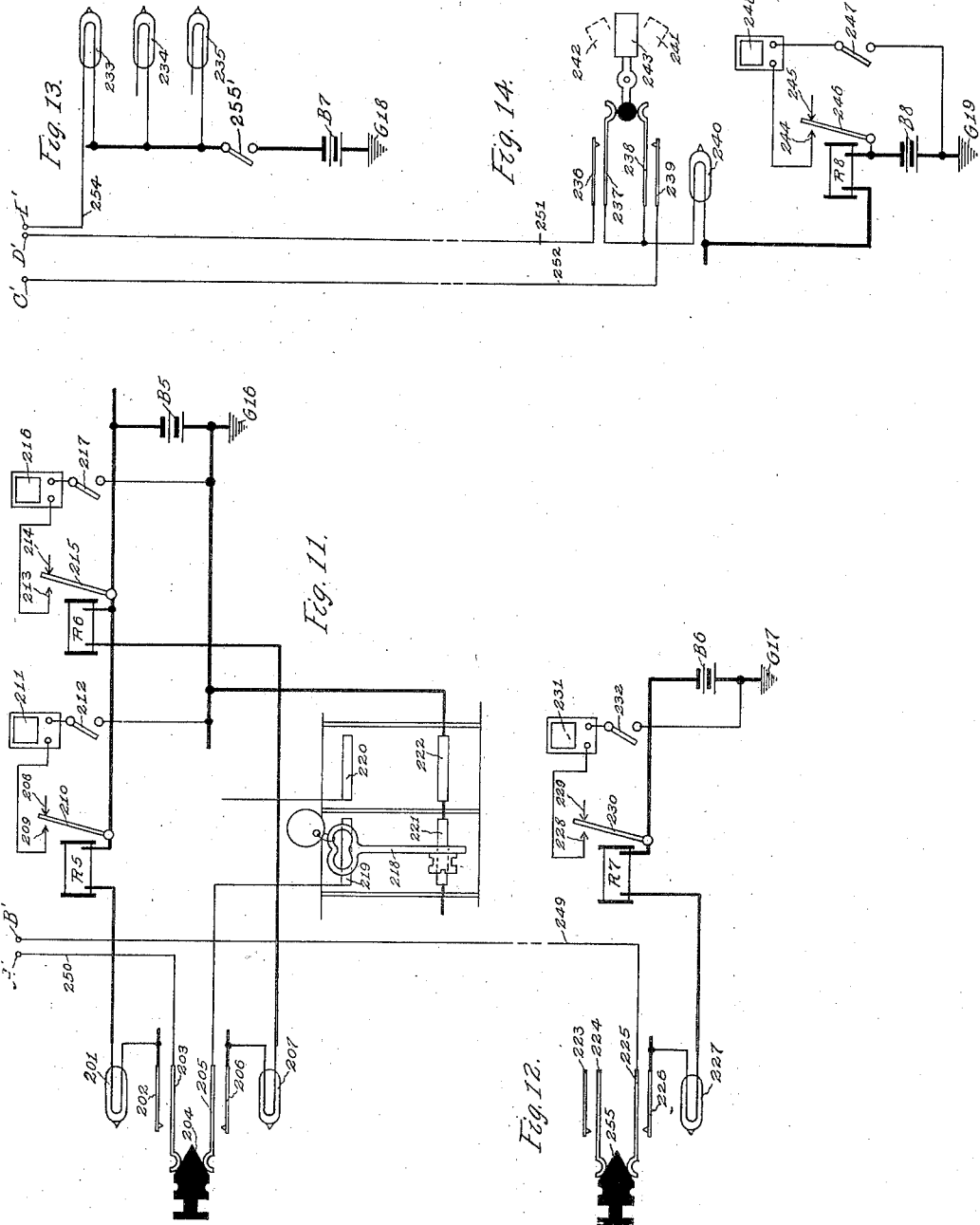
Herbert M. Friendly

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4 SHEETS—SHEET 4.



Witnesses:

Scott G. Gandy
M. L. Snapp.

Inventor:

Herbert M. Friendly.

UNITED STATES PATENT OFFICE.

HERBERT M. FRIENDLY, OF PORTLAND, OREGON.

SIGNAL SYSTEM AND APPARATUS.

1,358,720.

Specification of Letters Patent. Patented Nov. 16, 1920.

Application filed November 23, 1915. Serial No. 63,028.

To all whom it may concern:

Be it known that I, HERBERT M. FRIENDLY, a resident of Portland, Multnomah county, Oregon, have invented new and useful Improvements in Signal Systems and Apparatus, of which the following is a specification.

My invention refers more particularly to applications in connection with telephone lines and private branch telephone exchanges, and its objects are:

To enable telephone operators to ascertain if the station to be called is responsive to a call.

Further, an object of this invention is to enable a private branch exchange operator, located, for instance, in a hotel wherein connection is made to guests' rooms, to be apprised, upon inserting a switching plug into a springjack to ring a guest's room, that the said room is locked from the outside, the inference being that the guest is without.

Further, an object of this invention is to enable attendants to remotely ascertain if a guest's room door is locked from without.

Further, an object of this invention is to enable attendants to remotely ascertain the location of other attendants, who may be renovating guests' rooms.

Further, an object of this invention is to enable attendants to remotely ascertain if the guest's door key is in its compartment in the door key case.

Further, an object of this invention is to allow signals to be extended from quarters of attendants to guests' rooms where a housemaid may be renovating.

Further, an object of this invention is to enable switchboard operators, or other attendants, to be apprised, upon a guest's door being unlocked from the outside.

Further, an object of this invention is to enable switchboard operators, or other attendants, to be apprised, upon a guest's door being locked from the outside.

There are many other applications and modifications belonging to and subordinate to this invention, which those skilled in the art to which it belongs will be able to adapt.

In the accompanying drawings and descriptions I have chosen such applications and organizations of my invention as I deem necessary to elucidate its principles, con-

struction, combinations and operation. The descriptions and illustrations are by no means exhaustive, and further, it is manifest that the features of my invention can be employed as an amplification or without their adoption as an entirety, and that the details of construction, operation and application can be varied and applied within wide limits without departing from its scope.

In the accompanying drawings:

Figure 1 shows the essential line and auxiliary equipments on a switchboard as commonly used in common battery telephone operation, together with a subscriber's station, S1, on a line extending from said switchboard, and means, automatic and manual, whereby the circuits at the subscriber's station may be so altered as to evidence an understood condition to the operator at the switchboard, upon her making connection with, or making suitable manipulation of, the switchboard equipment associated with the said line extending to the said subscriber's station.

Fig. 2 shows the essential parts of a common form of connecting cord circuit such as might be found on a private branch exchange switchboard suitable for use at a hotel, or for such similar service.

Fig. 3 shows the essential equipment on a switchboard as commonly used in common battery telephone operation in hotels, together with wires running to guests' rooms where connection is made to a telephone and to a contact device in connection with the door bolt, an additional wire being run to the said contact wire from the switchboard springjack corresponding to the said telephone.

Fig. 4 shows a diagrammatic circuit of a plug adaptable to use to obtain access to the line running to the employees' quarters shown in Fig. 3.

Fig. 5 shows a modification of the organization shown in Fig. 3, enabling a multiplicity of functions to be incorporated.

Fig. 6 shows diagrammatically a signal device. A signal device may be used to receive calls intended for the servants' quarters at a point remote therefrom.

Fig. 7 is a modification of the apparatus shown in Fig. 6.

Fig. 8 shows diagrammatically a plug

suitable for use in connection with the switchboard equipment shown in Figs. 3 and 5.

Fig. 9 is a modification of the apparatus shown in Figs. 6 and 7.

Fig. 10 is a partial assembly view of the apparatus shown diagrammatically in Figs. 6, 7 and 9, also comprising a display sign.

Fig. 11 shows a part of the system associated with Fig. 5 joined on to the lower portion of the latter figure. The apparatus shown is to enable an attendant to ascertain if a guest's room door is locked from the outside; and also to ascertain if the guest's door key is in its compartment in the door key case.

Fig. 12 shows a part of the system associated with Fig. 5 joined on to the lower portion of the latter figure. The apparatus shown is to enable an attendant to remotely ascertain when a guest's door may become unlocked.

Fig. 13 shows a part of the system associated with Fig. 5 joined on to a lower portion of the latter figure. The apparatus shown is to enable an attendant to remotely ascertain the location of attendants that may be renovating rooms.

Fig. 14 shows a part of the system associated with Fig. 5 joined on to the lower portion of the latter figure. The apparatus shown is to enable an attendant to remotely ascertain if a guest's room door is locked from the outside and also to ascertain when a guest's room may become unlocked from the outside.

Referring to the figures in detail:

In Fig. 1, J1 represents a springjack as commonly used on switchboards; R1 is a relay commonly known as a line relay associated therewith; 6 is the companion lamp to J1 in a local circuit relay R1. Completing a circuit between the springs 1 and 4, or between the line conductors 20 and 21' leading therefrom, will cause relay R1 to become energized by virtue of its deriving current from battery B1 through its helix, through contacts 3—4 and 1—2, to ground G3. This will cause said lamp 6 to glow, it thus acting as a calling signal. It will be observed that the closing of the limbs 20 and 21' of the line through the substation set S1 at contact between hook 21 and spring 22, as by removing the receiver 24, will cause a similar function.

Springs 10 and 11 are parts of a contact device and are adapted to be closed by a door bolt, 15, engaging insulated member 12, which is attached to spring 11. The said doorbolt may be actuated as commonly by the application of a lock key applied in the keyhole 16, or it may be a common door bolt or a moving member otherwise operated. In the drawing a so-called double lock in common use is shown, the bolt actuating the

contact members 10 and 11, being adapted to be operated from one side of the door only, while a second bolt, 13, is adapted to be actuated independently as by applying a lock key in keyhole 14 from the opposite side of the door. However, this second bolt is not essential and but one bolt actuated from either or both sides of the door is all that is required to carry out this phase of my invention. It will thus be observed that, should the application be made to a hotel guest room, for instance, and the keyhole 16 considered as on the outside of the door, the guest upon locking his door from the outside will cause contacts 10—11 to be closed, thereby causing the line conductor 20 connected to the jackspring 1 to become grounded through the gravity hook 21, and its engaging spring 23. A similar grounding action would ensue if switch 19 were closed. The latter switch may be closed by designed mechanical movement or automatically. If either contact 10—11 or the switch 19 are closed and hook switch of substation set S1 is in normal position and a plug, as P1, Fig. 2, is applied into springjack J1, relay R2 will become energized, opening contact 28—29, thus precluding the glowing of lamp 30. The lamp 30 can only glow when plug P1 is inserted into springjack J1 under the conditions that relay R2 would not be energized, as would be the case if contacts 10—11 were open and switch 19 was open. Upon the insertion of said plug P1 into said springjack J1, the nonglowing of lamp 30 will indicate to the operator that either the guest's room door is locked from the outside (provided that the contact device is adapted to be actuated by the outside bolt) or that the switch 19 has been closed. In either event the operator would understand further that the guest was not available, or did not wish to be called.

While the description above has been specific as regards a guest's room in a hotel, it is manifest that this may with equal facility be adapted to general exchange operation wherein the substation and the contact device or switch are many feet or many miles remote from the switchboard. The contacts 10—11, while shown actuated by a door bolt, may be with equal facility actuated by the closing of a rolltop desk, for example, thus the opening of a desk or the closing of a desk would cause the contacts 10—11 to be closed, whereupon the insertion of a plug into the associated springjack J1 would give a predesigned indication to the operator located remotely. The conductor leading from spring 10 and from switch 19 leads to a spring 23, making contact with a hook device 21 of the substation S1 in the normal position, allowing electrical connection with a conductor 20 leading to jackspring 1. The tip of plug P1 registers with jackspring 1.

The switch 19 may be located at any convenient point, as for instance on the top of a telephone where its position would be readily observed. Such a switch might be used in case a subscriber was leaving his place of business and would desire to have the operator at the central office know that he was not available and could thus so report to calling parties or could transfer his call to another telephone, understood by pre-arrangement.

In Fig. 3, J2 and J3 respectively represent springjacks in a switchboard such as are commonly used at private branch exchanges, however, with auxiliary contacts 52 and 53 and 60 and 61 respectively. Relay R4, switch 70, buzzer 71 and battery B3 comprise the usual so-called night alarm circuit equipment common to all line signals as employed in usual practice. 78 and 79 represent springs of a contact device adapted to be actuated by lockbolt 77. Similarly 80 and 81 represent springs of a contact device adapted to be actuated by lockbolt 82.

S3 represents a usual type of substation telephone set as may be located in the maids' quarters of a hotel. The contact device, springs of which are designated 80 and 81, is so disposed in the doorjamb of said room that when the lockbolt 82 is actuated, as by locking the door with a key or other equivalent means, the said springs are flexed into electrical contact. It is a very common practice in hotels and such establishments to use double locks, one bolt of the lock being actuated by applying a key at the outside of the door and the other bolt being actuated by the key being applied from the inside of the door, the preferred arrangement being that the bolt 82 and also the bolt 77 referred to are actuated from the outside of the door. The contact device represented by springs 78 and 79 is located in the doorjamb of a guest's room, for instance, so that when the guest locks his door upon leaving, the bolt 77 will flex the springs 78 and 79 into electrical contact. Springjack J'4 is preferably located on the outside door casing of the said guest's room. In addition to being provided with the usual tip and sleeve springs 74 and 75 respectively this springjack has auxiliary contacts 72 and 73.

Ordinarily, on each floor, there would be one set, as S3, together with its associated contact device represented by springs 80 and 81. There would be as many sets as S2, with its associated contact door bolt device, as are represented by springs 78 and 79 and the associated springjack J'4, as there are guests' rooms or other equivalent rooms on each floor.

By referring to Fig. 2 it will be observed that, of a plug, as P1, is inserted into a springjack J3, the switchboard operator can

effect any of the usual connections with substation S3. Incidentally contacts 62—63 and 64—65 are opened; also springs 60—61 will be flexed into contact. Should the contact 80—81 be open, due to the doorbolt 82 being in normal position, the usual circuit conditions will prevail. If, however, contact 80—81 should be closed, as by the bolt 82 being in the locked position as if the room were unoccupied and locked from without, current would flow from grounded battery B3, through lamp 59, contact springs 60—61, over conductor 87, through contact 80—81 to ground G12', causing said lamp 59 to glow, indicating to the operator that the door of the room in which substation S3 is located, is locked from without and is therefore unoccupied. It would thus be unnecessary to signal. If, however, said plug P1 were inserted in jack J2 to ring guest's substation set S2 and the room containing said set were locked from the outside, indicating that it was unoccupied, lamp 51 would glow by deriving current in a similar manner to the previous case by way of contacts 52—53, conductor 84, contacts 79—78, to ground G11.

In order to reach the attendant, who may be absent from the room containing substation set S3, and who may be renovating a guest's room, such as the one containing substation set S2, a set consisting of a plug P4 and sounding device 161', as shown in Fig. 6 and in assembly in Fig. 10, may be employed. The latter device comprises a sign and a signal device, thus, at the time the maid enters said guest's room, she may insert the plug P4 into springjack J4. This will place the sounding device 161' into multiple relation with the sounding device 94' of substation set S3. The insertion of said plug P4 into jack J4 will also cause the springs 72 and 73 to be flexed into electrical contact, supplementing or performing the same circuit conditions as the flexing of springs 78 and 79. The object of this latter function will be shown later. It will be noted that, if the operator proceeds to ring substation set S3, the attendant will receive the signal as extended to device shown in Fig. 10. The attendant can then respond by using the telephone in the room being renovated, containing substation set S2. It will be observed that, since contacts 72—73 are in electrical continuity and contacts 78—79 are open, due to the fact that the attendant has unlocked the guest's room door, the conductor 84 is extended to ground G11, thus the lamp 51 will continue to glow after the operator has responded by inserting a plug, as P1, into springjack J2, in response to the attendant's response. The fact that the lamp 51 glows, while a plug is inserted in springjack J2, would normally indicate

to the operator that the guest's room door must be locked from the outside and that the guest is therefore without. However, since the lamp 51 first glowed as a calling signal, she knows that such cannot be the case and infers that the call must be the attendant's response to the call initially transmitted to station S3.

A further object in the multiple relation between springs 78 and 79 and 72 and 73 is that, should the operator desire to signal a guest's room while same is being renovated, the contact 78—79 being incidentally opened during that period, under her insertion of the switching plug into jack J2, the operator will observe the glowing of lamp 51, thus indicating to her that the guest is without.

Where desired the attendant may be given a set as shown in Fig. 4, consisting of a plug P3, a transmitter *t*, and a receiver R. She may respond to the call sent to substation set S3, by withdrawing the plug shown in Fig. 10 and inserting the plug P3 shown in Fig. 4. The object of the combined sign and signal is that supervising attendants, or others interested, may easily find the room that the attendant may be renovating, in case the attendant may be wanted in person.

Fig. 5, in conjunction with Figs. 11, 12, 13 and 14, shows a modified organization of my invention, as applied to such establishments as hotels wherein jack J4 represents the switchboard termination of a guest's, or other equivalent, room, of which there may be a multiplicity on each floor. J5 and J6 indicate the switchboard terminations of two attendant's room substation sets, which may be on one floor.

If it is desired to signal the guest's room substation set S4 to gain the response of the occupant, plug, as P1, would be inserted into springjack J4. This will incidentally close contact springs 105—106. If contact springs 147—148 are in electrical continuity as by the guest's room door 17' being locked from without, for instance, lamp 101 will glow by virtue of deriving current from battery B4, through contacts 105—106, over conductor 165, to ground G13.

In case the operator has attempted to call the guest over his said telephone and upon inserting the said switching plug P1 obtained the glowing of the said lamp 101, indicating that he was without, the operator may then withdraw the pushbutton 104, thus allowing the contact springs 102 and 103 to close. Then upon the guest unlocking his room door to enter, the contact springs 146 and 147 will become reflexed into electrical continuity, thereby completing a circuit from battery B4, through said lamp, over conductor 164, to ground G13. This will cause the said lamp 101 to glow and attract the attention of the operator, who will proceed to respond to the signal and inform the

guest of any message that may be left for him.

Should the operator desire to ascertain if the room, containing substation S6, is occupied by the attendant she may desire to summon, or otherwise, she may do so by inserting plug, as P1, into springjack J6. If the room door is locked from without the contact springs 162 and 163 will be in electrical continuity and the lamp 123 will thereupon glow by virtue of obtaining current from battery B4 through contact 128—129 over conductor 173 to ground G15. If however, the operator so desires, she may depress pushbutton 127 in lieu of inserting the said plug P1 as above described. This will perform the same circuit relation as regards lamp 123, conductor 173 and contact spring 163. The use of pushbutton 126, also the use of pushbutton 115, would be the same as above described for pushbutton 104.

Springjack, as per J7, is associated with and is a part of the telephone equipment of each guest's room and is preferably installed on the outside door casing of a corresponding room and performs a similar function to that described in connection with Fig. 3. However, it has the additional function of permitting special signal devices to be used for selective calling. For instance, the attendant, having headquarters at the room containing substation set S6, would carry a signal device plug wired as per Fig. 6, while the attendant having headquarters at the room in which substation set S5 is installed, would have a signal device wired, as per Fig. 7, or they may use a signal device wired as per Fig. 9, thus should ordinary alternating current signaling be attempted over jack J5, any plug, as per Fig. 7 or Fig. 9 inserted in jack J7, would be responsive; similarly such signaling current applied to jack J6 would actuate a signal device wired as per Fig. 6 or Fig. 9. Bearing in mind that a jack, as per J7, is installed associated with each guest's room, and that all the springs corresponding to 138 and 139 respectively are in multiple relation as regards each floor, for instance, and that certain attendants having headquarters at the room containing substation S5 or substation S6, as the case may be, will be provided with plugs, as per Fig. 6, certain attendants with plugs, as per Fig. 7, and certain attendants with plugs, as per Fig. 9, it will be seen that, upon the operator signaling on either jack J5 or J6, will extend her signal to the corresponding attendants, who may be renovating a guest's room and be provided with the prearranged signal device as above mentioned.

It is convenient to have means at the clerk's desk, so that he may ascertain if a guest's room door is locked from without,

without calling the room over the telephone or having some other attendant do so for him. I, therefore, provide pushbuttons, as per 204, Fig. 11, one corresponding to each
 5 room. Upon depressing one of said push-buttons, say the one corresponding to the line terminating on springjack J4, and bearing in mind that A and A' are identical and that B and B' are identical, and that C
 10 and C' are identical, and that D and D' are identical, and that E and E' are identical, it will be observed that, if the guest's room door 17' is locked from without, the closing of contacts 202—203 will cause lamp 201 to
 15 derive current from battery B5, over conductor 250, conductor 165, to ground G13, by way of contacts 148—147. Relay R5, buzzer 211 and switch 212 comprise an alarm circuit common to all similar push-
 20 buttons that may be on the clerk's desk. Coincident with the closing of contact 202—203, contact 305—206 will become closed. Guest's room door key 218 is in key compartment in the office or other point.
 25 219 and 221 are metallic plates that serve to allow an electrical connection to be made from spring 205, through the door key, to ground G16. Relay R6, buzzer 216 and switch 217 comprise equipments in an alarm
 30 circuit associated with lamp 207.

Should the clerk depress push button 204, as above mentioned, and the guest's room referred to is locked from without, the guest's key being in its place in the key case, lamps
 35 201 and 207 will glow, indicating to the clerk the positive condition. The said lamps 201 and 207 may be common to all pushkeys in the installation, all corresponding springs 202 and 206 being connected in multiple relation. Pushkey 204 is a locking key and may, therefore, be depressed and mechanically held thus. Then if the controlling switches 212 and 217 of the pilot circuits are closed, their respective buzzers will sound
 40 upon current being derived through their respective relays.

The circuit and equipment shown in Fig. 12 is for the purpose of enabling the clerk to not only ascertain if the room door is un-
 50 locked from the outside, indicating that the guest is probably within, but it is to enable him in the event that he finds the guest has his door locked from without to depress button 255 to its locked position. Upon the
 55 guest unlocking his door current from battery B6 will be derived through relay R7, through lamp 227, causing it to glow, through contacts 226—225, over conductor 249, through contacts 146—147, to ground
 60 G13. Provided switch 232 is closed, the clerk will be apprised by the sounding of the buzzer 231 immediately upon the guest unlocking his door from without. But one lamp, as 227, would be used common to any

number of buttons, as per 255. All corre- 65
 sponding springs 226 may be connected in multiple relation to enable the lamp 227 to be used as a common lamp.

Fig. 13 shows only three lamps of as many lamps as there may be guests' rooms on any
 70 floor, for instance, controlled by switch 255'. Said lamps and switch may be located at the housekeeper's quarters, or convenient to the switchboard operator. By closing said switch, lamps will glow corresponding to
 75 every guest's room into the doorcasing springjack, as J7, of which may be inserted a plug, the battery B7 obtaining ground through the corresponding lamp and the contacts corresponding to 135—136, to
 80 ground G13. It will be observed that when a plug, as P4, Fig. 6, is inserted into springjack, as J7, the spring 137 registers with the tip conductor of the plug. Also springs 135, 136 and 137 are flexed into electrical
 85 contact with each other.

Fig. 14 represents one of as many keys, the cam of which is designated 243, as there may be guests' rooms. It has with it an associated lamp 240 and a common pilot cir-
 90 cuit comprising relay R8, buzzer 248 and controlling switch 247. Key cam 243 has three positions—the normal position shown, position 241, which incidentally closes contact 236—237, and position 242, which inci-
 95 dentally closes contact 238—239. The equipment shown in said Fig. 14 may be located at the floor attendant's quarters or other suitable place, and it is to enable said attendant to remotely ascertain the locked or unlocked
 1 state of the guest's room door as regards the outside lockbolt. If the door is unlocked, meaning that contact 146—147 is closed, current from battery B8 will flow through
 105 relay R8, lamp 240, contact 238—239, over conductor 252, to ground G13, by way of said contact 146—147, glowing the said lamp 240, and thus indicating to the attendant manipulating the said key cam 243 that the
 110 guest's room door is unlocked with relation to the outside doorbolt, the conclusion being that the guest must still be in his room. If it is desired to know when the guest has left his room and in the usual order locks his
 115 door from the outside, key cam 243 will be moved to the position 241 and allowed to lock in that position, thus permanently closing contacts 236—237. Upon the guest locking the door from the outside, incidentally closing contacts 147—148, current from bat-
 120 tery B8 will flow through relay R8, through lamp 240, through contact 237—236, over conductor 251, through contact 148—147, to ground G13, glowing lamp 240, and incidentally energizing relay R8, closing con-
 125 tacts 244—246 and causing buzzer 248 to sound, switch 247 being assumed closed.

Having thus described these specific ap-

plications of my invention, what I claim is new and desire to secure by United States Letters Patent, is:

1. In a signal system the combination of
5 a springjack with conductors leading there-
from to a substation set; a plug of a switch-
ing set adapted to register with said spring-
jack, said switching set having indicating
elements so related to said plug that a closed
10 or open-circuit condition through said sub-
station set may be determined; a contact de-
vice controllable by a switch adapted to
close a ground connection with one only of
said conductors so the said indicating ele-
15 ments will respond as if the path through
said substation set were closed.

2. In a signal system the combination of
a springjack with conductors leading there-
from to a substation set; a plug of a switch-
20 ing set adapted to register with said spring-
jack, said switching set having indicating
elements so related to said plug that a closed
or open-circuit condition through said sub-
station set may be determined; a contact
25 device controllable by a switch operated by
a door-bolt adapted to close a circuit path
to one only of said conductors so the said
indicating elements will respond as if the
path through said substation set were closed.

3. A springjack on a telephone switch-
30 board with conductors leading therefrom to
a substation set; contact points which nor-
mally make connection from said conduc-
tors through said springjack to signal equip-
ment adapted to actuate upon path of said
35 conductors becoming closed through said
substation set; a third conductor closable to
a common conductor to said signal device
through the agency of a circuit-closing de-
vice at a remote point and a contact de-
40 vice in said springjack adapted to close said
conductor to the free terminal of said signal
equipment upon a switching plug regis-
tering with said springjack.

4. A springjack with conductors leading
45 therefrom to a substation set; contact points
which normally make connection from said
conductors through said springjack to signal
device equipment adapted to actuate
50 upon path of said conductors becoming
closed through said substation set, said con-
tact points opening connection upon a
switching plug registering with said spring-
jack; a third conductor closable through
55 said signal equipment to a common termi-
nal of said signal equipment through the
agency of a circuit-closing device at a re-
mote point and an auxiliary contact device
in said springjack adapted to close said
60 conductor to the free terminal of said signal
equipment upon a switching plug regis-
tering with said springjack.

5. The combination of a telephone line
65 leading from a springjack on a switchboard;
a substation set on said line; an independ-

ent conductor, a contact device companion
to said springjack adapted to connect said
independent conductor to a terminal of a
signal equipment normally connected to said
line and which will actuate upon line-circuit
70 closing; contacts in said springjack adapted
to disassociate said signal equipment from
said line upon a switching plug registering
with said springjack; a second conductor
common to said contact device and said signal
75 equipment, a contact device adapted to com-
plete a circuit over said conductor and over
said second conductor common to said con-
tact device and said signal equipment to ac-
tuate said line-signal equipment and means
80 independent of the substation for operating
said contact device.

6. The combination of a line springjack
having two line springs normally in con-
85 tact respectively with two anvils, one of
which anvils is electrically connected to
ground and the other of which anvils is elec-
trically connected to the free terminal of a
signal equipment whose other terminal is
connected to a grounded current source, the
90 said anvils designed to disengage said line
springs upon the registry of a switching
plug with said springjack; a first and a sec-
ond conductor leading from said line springs
respectively and extending to a substation
95 set; a third conductor leading to a first ter-
minal of a contact-making device controlled
by the bolt of the door to the room contain-
ing said substation set, and extending to
ground; a fourth conductor leading from
100 the companion terminal of said first termi-
nal of said contact-making device to a first
of a set of two auxiliary contacts on said
springjack, said contacts being normally dis-
engaged with respect to each other but adapt-
105 ed to engage upon registry of a switching
plug with said springjack, the second of
said auxiliary contacts electrically connected
with the free terminal of said signal equip-
ment.

7. The combination of a line springjack
and an associated calling signal device hav-
ing one terminal connected to a common
current source terminal, said springjack
having a set of auxiliary contacts adapted
115 to be closed incidental to the normal inser-
tion of a switching cord plug into said
springjack; a first conductor from one aux-
iliary contact of said set leading to the free
terminal of said signal device, a second con-
120 ductor from the other auxiliary contact of
said contact set extending to a contact-mak-
ing device operative from a door-bolt which
said contact device is adapted to effect a
connection from said second conductor to
125 ground upon the door-bolt being turned to
locked position; a second springjack mount-
able companion to said door-bolt and having
a set of contacts in multiple relation with
contacts of said contact-making device, the
130

said latter contacts adapted to be closed upon the insertion of an adapted plug into said second springjack, the closing of said latter springjack contacts forming the same circuit function as the said contacts operative from said door-bolt.

8. A line springjack on a switchboard having conductors leading from its tip and sleeve springs to a substation set in a guest's room; an auxiliary conductor leading from an auxiliary spring of said springjack extending to a contact device operated by the door-bolt of said guest's room, the locking of said guest's room closing a circuit from said auxiliary conductor to a common terminal of a signal device the free terminal of which extends to a contact of said springjack companion to said auxiliary spring, which springs are adapted to engage upon a switching plug registering with said springjack on said switchboard similarly related to an attendant's room substation set and contact device controlled by door-bolt of said latter room; as many springjacks corresponding to guests' rooms as there may be guests' rooms in a group, all of the tip and sleeve springs respectively of the latter springjacks being in multiple relation with each other and with the tip and sleeve conductors respectively leading to said attendant's room and said second springjack; a plug comprising a signal device, said plug adapted to register with said latter springjacks.

9. The combination of a springjack on a switchboard with conductors leading from the tip and sleeve springs thereof to a substation set in a guest's room; anvils of said springjack normally registering with said tip and sleeve springs; a third conductor leading from one of said anvils extending to a common terminal of a signal device, a conductor leading from the other said anvil extending to the free terminal of said signal device; a set of auxiliary contact springs on said springjack one spring of which has a conductor leading to the said free terminal of said signal device and the companion spring of which has a fourth conductor which leads to the make spring of a set of three contacts in a contact device operative from the door-bolt of the said guest's room, the pivot spring of which is connected to said common terminal, the break contact normally registering leading to one of an auxiliary set of normally open switch contacts companion to said springjack, the mate contact of which is electrically connected to the said free terminal of said signal device; a switching plug adapted to register with said springjack and incidentally close said auxiliary contacts, the latter to the purpose of completing circuit to said signal device when door-bolt is in locked position; a means of effecting contact between elements

of said auxiliary switch contacts for the purpose of completing circuit to said signal device when said door-bolt is in normal position.

10. The combination of a springjack on a switchboard with conductors leading from the tip and sleeve springs thereof to a substation set in a guest's room; anvils of said springjack normally registering with said tip and sleeve springs; a third conductor leading from one of said anvils extending to a common terminal of a signal device, a conductor leading from the other said anvil extending to the free terminal of said signal device; a set of auxiliary contact springs on said springjack one spring of which has a conductor leading to the said free terminal of the said signal device and the companion spring of which has a fourth conductor which leads to the make spring of a set of three contacts in a contact device operative from the door-bolt of the said guest's room, the pivot spring of which is connected to said common terminal, the break contact normally registering leading to one of an auxiliary set of normally open switch contacts companion to said springjack, the mate contact of which is electrically connected to the said free terminal of said signal device; a switching plug adapted to register with said springjack and incidentally close said auxiliary contacts, the latter for the purpose of completing circuit to said signal device when door-bolt is in a locked position; a means of effecting contact between elements of a said auxiliary switch contacts for the purpose of completing circuit to said signal device when said door-bolt is in normal position; a second springjack with auxiliary contacts associated with the contacts of the device operated by said door-bolt and located contiguous to the said guest's room so related electrically that upon inserting a plug into said second springjack contacts therein will close forming the same circuit relations respecting the said third conductor as if the said door-bolt were in a locked position.

11. A line springjack having conductors extending from its two engaging springs to a substation set in a guest's room; a third conductor extending from an auxiliary spring of said springjack to a contact of a circuit-closing device adapted to be operated by the door-bolt of said guest's room; a second springjack similarly related to an attendant's room substation set and a contact-closing device controlled by the doorbolt of said attendant's room; springjacks corresponding to guests' rooms and contiguous thereto in groups, all the engaging springs respectively of said latter groups of springjacks being in multiple relation with each other and with the conductors respectively leading to the said attendant's room and

said second springjack; a plug comprising a signal device adapted to electrically register with the engaging springs of the said contiguous springjack; a set of auxiliary 5 contacts adapted to be placed into electrical connection between said third conductor and a terminal common to a signal device at said first springjack and the free terminal of said contact-closing device upon the regis- 10 try of said plug with a said contiguous springjack.

12. In a signal system adaptable to hotel guests' rooms and equivalent uses, a first contact device operative by the door-bolt 15 of a guest's room; a source of current, a springjack leading to a telephone set in said guest's room; a first conductor leading from said first contact device to a second contact device adapted to operate upon the 20 insertion of a switching plug into said springjack, the first said contact device completing an electrical connection between said first conductor and a common conductor and the said second contact device completing 25 operative electrical connection between said first conductor and a signal device one terminal of which is in electrical connection through said source of current to said common conductor.

30 13. In a signal system adaptable to hotel guests' rooms and equivalent uses, a first contact device operative by the door-bolt of a guest's room; a springjack leading to a telephone set in said guest's room; conduc- 35 tors leading from said first contact device to a second contact device adapted to operate upon the insertion of a switching plug into said springjack, the first said contact device completing electrical connection be- 40 tween said conductors and the said second contact device completing a connection through a signal device, and a source of current.

45 14. A hotel signal system comprising a central office switchboard having springjacks, telephone lines leading from the

springjacks to telephones in the guests' rooms, signal devices adapted to register with springjacks contiguous to and corresponding to the guests' rooms, a signal de- 50 vice at the switchboard for each line, and means whereby the connection of the first of said signal devices with the corresponding springjacks will actuate a signal device corresponding to the line and central office 55 springjack.

15. In a signal system a springjack connected by talking conductors with a substation set, a signal device, a set of auxiliary contacts on said springjack for closing the 60 free terminal of said signal device to a common conductor leading to the substation set, the other terminal of said signal device being connected to one pole of a common current source; a switch device operated by 65 a door-bolt which is adapted to close said common conductor to the opposite pole of said common current source.

16. In a signal system a springjack connected by talking conductors with a substa- 70 tion set; a signal device associated with said springjack which will actuate upon a closed circuit condition ensuing through said substation set; a set of auxiliary contacts on said springjack for closing the free terminal 75 of said signal device to a common conductor connecting the signal device and substation, the other terminal of said signal device being connected to one pole of a common current source; a switch device operated by 80 a door-bolt which is adapted to close said common conductor to the opposite pole of said common current source.

Signed by me at Portland, county of Multnomah, and state of Oregon, in the 85 presence of two witnesses, this 9th day of November, 1915.

HERBERT M. FRIENDLY.

Witnesses:

A. E. BURNS,
SCOTT BOZORTH.