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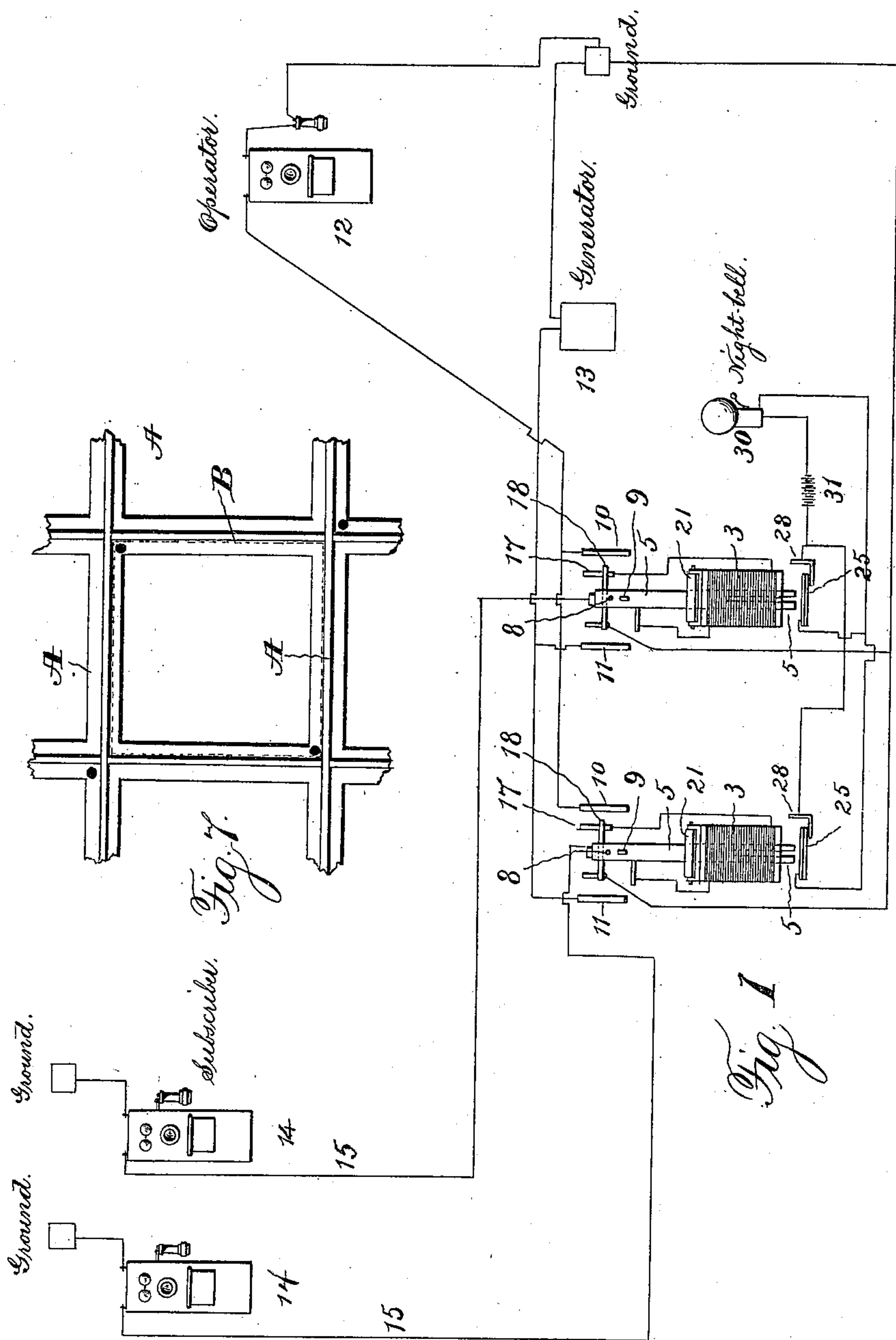
Patented Jan. 10, 1899.

J. M. OVERSHINER.  
TELEPHONE SWITCHBOARD.

(Application filed Aug. 4, 1896.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses

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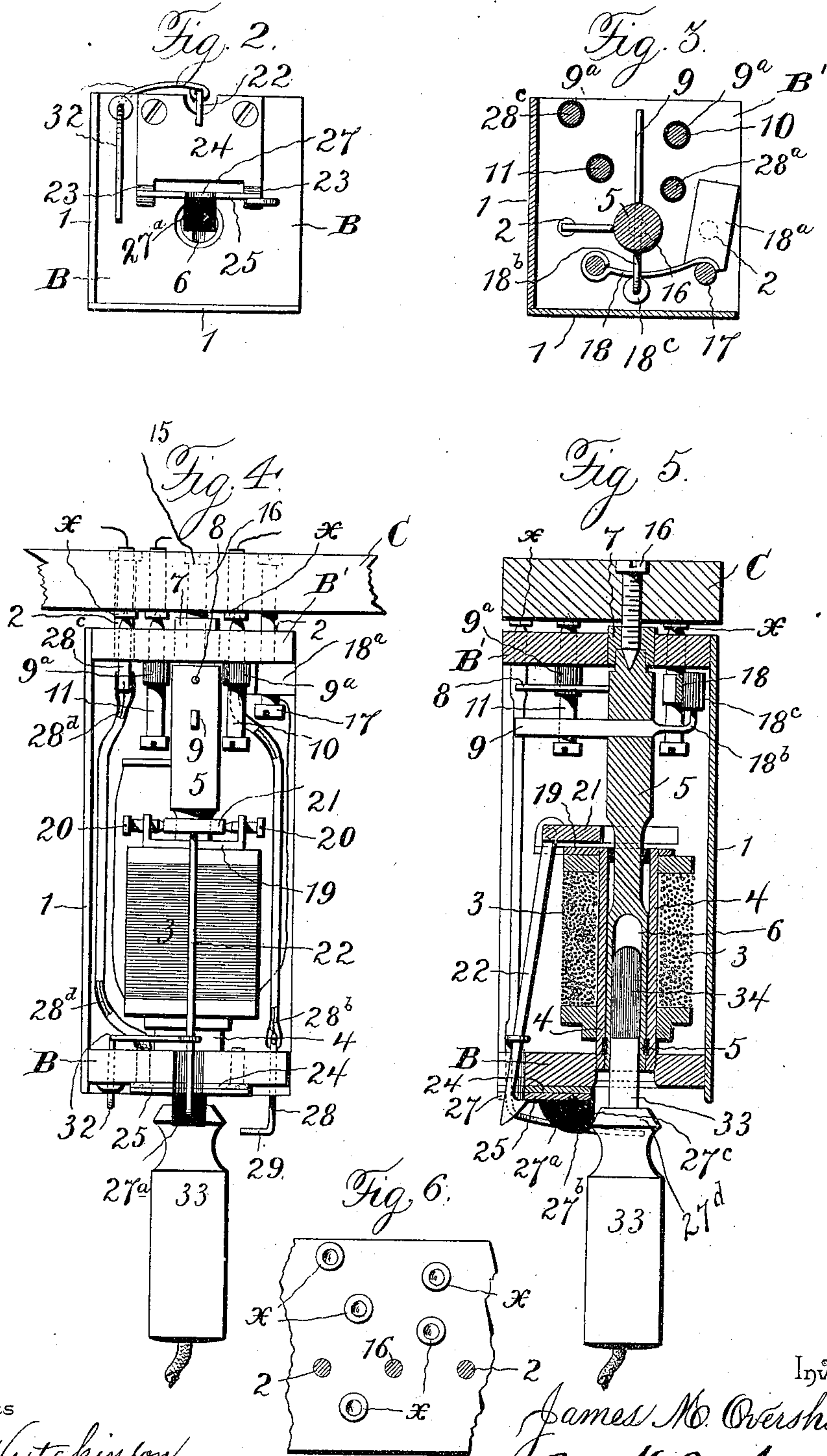
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# UNITED STATES PATENT OFFICE.

JAMES M. OVERSHINER, OF ELWOOD, INDIANA.

## TELEPHONE-SWITCHBOARD.

SPECIFICATION forming part of Letters Patent No. 617,691, dated January 10, 1899.

Application filed August 4, 1896. Serial No. 601,622. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES M. OVERSHINER, of Elwood, in the county of Madison and State of Indiana, have invented certain new and useful Improvements in Telephone-Switchboards; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in telephone-switchboards, the object of the invention being to simplify and speed the work at the central office of answering calls, making connections, &c.

A further object is to so construct a telephone-switchboard as to economize space.

A further object is to so construct a switchboard that the parts thereof can be easily and quickly assembled or disassembled without the necessity of soldering or unsoldering any of them.

A further object is to construct a switchboard in such manner that a single jack, magnet, and drop can be readily and quickly removed without disturbing any other set of devices or other part of the switchboard and without the necessity of detaching any wires except the main wire leading to a subscriber's instrument.

A further object is to provide means whereby to prevent a drop from falling when a subscriber is being called by the operator at the central office.

A further object is to provide means whereby to prevent noise in the receiving instruments incident to the operation of the calling devices.

A further object is to produce a switchboard which shall be simple in construction, comparatively cheap to manufacture, and which shall be effectual in all respects in the performance of its functions.

With these objects in view the invention consists in a jack for a switchboard adapted to rock and having a socket for the reception of a switch pin or plug and contact-pins co-operating with said jack.

The invention further consists in the combination, with a jack adapted to rock and a contact-arm thereon, of a circuit including a subscriber's telephone and said jack, a cir-

cuit including a generator and a contact-post to be engaged by the contact-arm on said oscillatory jack, and a circuit including an operator's telephone at the switchboard and a contact-post to be engaged by the contact-arm on the oscillatory jack.

The invention also consists in the combination, with a magnet and a drop, of a jack mounted to rock in said magnet and adapted to be included in circuit with a subscriber's telephone, a contact-arm on said jack, and two contact-posts to be engaged by said contact-arm when the jack is rocked in one direction or the other, one of said contact-posts being included in circuit with an operator's telephone and the other contact-post being included in circuit with an electric generator.

The invention also consists in the combination, with a magnet, its armature, and a hinged drop, of a jack mounted to rock loosely in the core of said magnet and adapted to receive a connecting pin or plug.

The invention also consists in the combination, with a jack, of contact-posts to be electrically connected with said jack when the latter is turned in one direction or the other, one of said posts being connected with an operator's telephone and the other being connected in circuit with a generator, a drop, a magnet included in circuit with a subscriber's telephone and said jack, and a switch in said last-mentioned circuit, whereby to open-circuit the magnet when the jack is electrically connected with the generator.

The invention also consists in the combination, with a jack having a socket therein and adapted to be operated to include a generator in circuit with a subscriber's telephone, of a switch pin or plug having a forward insulation portion.

The invention further consists in the combination, with a hinged drop for a switchboard, of a block secured to the outer face of said drop, said block being constructed and adapted to serve as a stop for the drop, a weight, and means for returning the drop to its normal position when the plug is inserted into the jack corresponding to said drop.

The invention also consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.



In the accompanying drawings, Figure 1 is a diagrammatic view illustrating my invention. Fig. 2 is a front end view of one jack and attached parts. Fig. 3 is a horizontal cross-section. Fig. 4 is a plan view. Fig. 5 is a longitudinal cross-section. Fig. 6 is an inside face view of a portion of the back of the switchboard, and Fig. 7 is a view of a section of the front frame of the switchboard.

10 A represents an open frame, which may be made of wood or metal (preferably metal) and adapted to receive a number of small blocks B of hard rubber or other insulating material, each having a hole in its center  
15 for the accommodation of the connecting or switch pin or plug, as hereinafter explained. Each block B is connected to a rear block B' of similar size and material by means of plates 1 of insulating material, and said rear block  
20 B' is removably secured to the back C of the switchboard by means of screws 2. Each block B supports an electromagnet 3, the block being made in its back with a screw-threaded socket for the reception of the screw-threaded  
25 end of the tubular core 4 of said magnet.

A jack 5 is mounted to rock in the tubular core 4 and is insulated therefrom, one end of said jack being split and made with a socket 6, which communicates with the hole in the  
30 block B for the reception of the connecting plug or pin. The jack 5 extends some distance beyond the rear end of the magnet and at its rear end is loosely mounted in a socket-piece 7, secured in the rear block B'. A contact-arm 9 projects upward from the jack 5,  
35 near the rear end thereof, and at respective sides of said arm contact posts or pins 10 11 are secured in the rear block B'. A spring-arm 8 projects upwardly from the jack 5,  
40 parallel with the contact-arm 9, and is adapted to engage insulating-collars 9<sup>a</sup> on the contact-posts 10 11, said arm serving to rock the jack and move the contact-arm away from the contact-post when said jack is released  
45 by the operator. Each pin 10 is included in circuit with an operator's telephone 12, located in proximity to the switchboard, and each pin 11 is included in circuit with an electric generator 13, as shown in Fig. 1.  
50 The jacks 5 are included in circuit with the subscribers' telephones 14 by line-wires 15, which are electrically connected to screws 16, passing through the back C of the switchboard and entering the socket-piece 7, said  
55 screw 16 also serving to assist the screws 2 in supporting the blocks B B', jack, and other parts. One end of the coil of the electromagnet is connected with the jack 5, which passes through it, and the other end of said coil is  
60 connected with a contact-pin 17, secured to the rear block B'. An arm 18, having a weighted end 18<sup>a</sup>, is pivoted to the rear block B' under the jack, and its weighted end normally rests on the pin 17, so as to make electrical contact  
65 therewith, said arm 18 being connected with the ground, as shown in Fig. 1. The jack is provided with an arm 18<sup>b</sup>, having an insulated

end 18<sup>c</sup> disposed under the arm 18, so that when the jack is turned in one direction the arm 18 will be moved out of contact with pin 17. 70

A plate 19 of non-magnetic material is secured at the rear end of the magnet 3 and provided with ears for the reception of screws 20, in which the armature 21 of said magnet is pivoted to swing, said armature being cut  
75 away for the accommodation of the jack 5. A latch-arm 22 is secured to the swinging armature 21, (preferably at or near the upper edge thereof,) the free end of said latch-arm passing through a slot in the insulating-  
80 block B.

A plate 24 is secured to the front face of block B (at or near the upper edge thereof) and is provided at its lower edge with ears 23, to which latter the drop 25 is hinged, said  
85 drop being thus disposed immediately in front of the block B, just over the socket for the switch pin or plug. The drop 25 is made in its free edge with a notch 27 for the reception of the latch 22, by means of which latter  
90 the drop is normally maintained in its closed or raised position, so as to cover the number of a subscriber's line on the plate 24. A block 27<sup>a</sup> of insulating material and having a curved outer face 27<sup>b</sup> is secured to the outer face of  
95 the drop 25, and the lower end of this block is made flat, so as to form a shoulder or stop 27<sup>c</sup>, whereby to limit the downward movement of the drop and cause it to assume a horizontal position when released, the weight of said  
100 block serving to insure the falling of the drop.

It is apparent that when the magnet is energized the armature 21 will be moved, the latch-arm raised, and the drop released, thus  
105 permitting the latter to fall to a horizontal position and display the number on the plate 24, at which time the block 27 will be immediately over the socket for the switch-pin. When the connecting or switch pin is inserted into the socket in the jack, the shoulder 27<sup>d</sup>  
110 of said pin will engage the curved face of block 27 and the drop will be forced up and automatically locked in its normally raised or closed position.

An arm 28 projects from the block B and is  
115 provided at its free end with a shoulder 29, to be engaged by the drop 25 when the latter falls, said arm 28 being electrically connected with a pin 28<sup>a</sup> in the rear block B' by a wire 28<sup>b</sup>. The drop is electrically connected with  
120 a pin 28<sup>c</sup> by a wire 28<sup>d</sup>, and said pins 28<sup>a</sup> and 28<sup>c</sup> are included in circuit with bell 30 and battery 31, the purpose of said bell being to attract the operator's attention at night when a drop falls. 125

An L-shaped arm 32 is mounted in a hole in the block B and loosely connected with the free end of the latch-arm, so that when a subscriber calls the central office the L-shaped arm will be vibrated rapidly and serve to attract the attention of the operator. 130

The connecting or switch pins or plugs 33 are preferably flat or angular in cross-section and will be electrically connected together in



pairs by flexible conductors in the usual manner; but I propose to insulate the forward portion of one of said pins or plugs of each pair, as at 34, for a purpose which will presently appear.

In order to provide simple and efficient means for connecting the various contact posts and wires with the circuit-wires on the back C of the switchboard, said contact-posts and the pins to which the bell-wires are connected are made to project a short distance through the back block B' and to engage buttons *x*, secured to the back C, said buttons having the various circuit-wires connected with them. It will be seen that when a jack and attached parts are placed in position and the screws 2 passed through the back C and made to enter the rear block B' the latter will be drawn toward the back C and the contact posts and pins made to tightly engage the buttons *x* and effect good electrical contact.

It is apparent that any jack and all of its cooperating parts can be readily removed without detaching any wires (except the main circuit-wire) by withdrawing the screws 2 and the screw 16. Each jack and all its connections and cooperating parts are arranged in compact form and are carried by the frame comprising the blocks B B' and connecting-plates 1, and said frames are supported by the back C.

When a subscriber calls the central office, one of the drops 25 will be released, as above explained. The operator will then insert a connecting or switch pin or plug into the jack (at the same time forcing the drop back to its raised position) and then rock the jack to the right until the contact-arm 9 thereon engages the contact-post 10, thus switching the operator's instrument 12 into circuit with the subscriber's telephone. After ascertaining the number of the subscriber wanted the operator will insert the pin at the other end of the flexible cord or conductor into the jack which communicates with the telephone of the subscriber to be called; but the operator will only insert the insulated portion of this pin into the jack. The second jack will then be turned to the left by means of the switch or connecting-pin and the generator 13 will be switched into circuit with the instrument of the subscriber being called. By insulating the forward portion of the switch-pin the noise in the telephone of the calling subscriber incident to the operation of the generator will be effectually avoided. When the second subscriber shall have been called, the operator will push the switch pin or plug in to the full extent and allow the jack to return to its normal position with the contact-arm 9 between the contact-posts 10 11. The two subscriber's instruments will then be electrically connected together.

When the subscribers are through talking and operate their signaling apparatus, the L-shaped arm 32 will be rapidly vibrated, and thus the operator's attention is called and he

is thus notified that the subscribers are through with the use of the lines.

When the jack is turned to include the generator in circuit with the instrument of the subscriber being called, the pivoted contact-arm 18 will be raised from the contact-pin by means of the arm 18<sup>b</sup>, and thus the circuit through the magnet will be opened and the drop will be prevented from being released and falling while the generator is in circuit for the purpose of calling a subscriber.

By constructing a switchboard in the manner above described the devices connected with the respective subscribers' lines are compactly arranged, occupying a minimum amount of space.

My improvements are very simple in construction, comprise few parts, can be easily and quickly assembled, can be readily repaired, and are effectual in all respects in the performance of their functions.

Various slight changes might be made in the details of construction of my invention without departing from the spirit thereof or limiting its scope, and hence I do not wish to limit myself to the precise details of construction herein set forth.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A telephone-switchboard comprising a series of combined drop devices and jacks, each comprising in a single structure, a magnet, a drop, a latch device for the drop, a rocking jack having a socket in its end for the reception of a plug and contact-pins cooperating with said jack.

2. The combination with a magnet and a drop, of a jack mounted to rock in said magnet and adapted to be included in circuit with a subscriber's telephone, a contact-arm on said jack and two contact-posts to be engaged by said contact-arm when the jack is rocked in one direction or the other, one of said contact-posts being included in circuit with an operator's telephone and the other contact-post being included in circuit with an electric generator, substantially as set forth.

3. The combination with a magnet, its armature and a hinged drop connected with said armature, of a jack mounted loosely to rock in the core of said magnet and adapted to receive a connecting or switch pin or plug, and contact-pins cooperating with said jack, substantially as set forth.

4. The combination with a magnet having a hollow core, of a jack mounted to rock in said hollow core and adapted to receive a switch-pin, a drop hinged in front of said magnet and jack, and contact-pins cooperating with said jack, substantially as set forth.

5. The combination with a magnet having a hollow core, and an armature at the rear end of said magnet, of a jack mounted to rock in said hollow core and adapted to receive a switch-pin, a drop hinged in front of said magnet and jack, a latch secured to the



armature and adapted to receive the drop whereby to normally retain the latter in its raised position, and contact-pins coöperating with said jack, substantially as set forth.

5 6. In a switchboard the combination with two blocks and plates connecting said blocks, of a magnet secured to one of said blocks, a jack mounted to rock in the core of said magnet and also mounted in the other block, and  
10 contact-pins to be engaged by said jack, substantially as set forth.

7. In a switchboard, the combination with a jack adapted to rock and a contact-arm thereon, of contact-pins to be engaged by said  
15 contact-arm, insulating-collars on said contact-pins, and a spring-arm on the jack to engage said insulating-collars whereby to prevent electrical contact of said spring-arm with said contact-pins and cause electrical  
20 contact between the contact-pins and jack to be broken when the latter shall have been released by the operator, substantially as set forth.

8. The combination with a jack having a  
25 socket therein, of a drop hinged in front of said jack, and a block secured to said drop, said block constituting a stop for the drop, a weight and means for returning the drop to its normal position when the plug is inserted  
30 into the jack, substantially as set forth.

9. In a switchboard, the combination of two blocks and strips connecting said blocks, a magnet, and a jack mounted between said blocks, contact-pins projecting through the  
35 rear block, a switchboard-back and buttons secured to said back and adapted to be engaged by said contact-pins, and means for securing said rear block to the switchboard-back, substantially as set forth.

40 10. The combination with a jack adapted to rock and to receive a switch-pin, of contact-posts arranged at the respective sides of said jack, one of said contact-posts being included in circuit with an operator's telephone and  
45 the other contact-post being included in circuit with a generator, a contact-arm on the jack to engage said contact-posts when the jack is moved in one direction or the other, and a spring-arm secured to said jack so as  
50 to engage a contact-post when the jack is turned in one direction or the other and act to force the contact-arm away from said post when the jack shall have been released by the operator, substantially as set forth.

55 11. In a switchboard, the combination with a frame and a series of blocks secured thereto, of a magnet secured to each block, an oscillatory jack mounted in said magnet, a drop supported in front of said magnet and jack,  
60 a plate secured to the rear end of the magnet, an armature pivotally supported by said plate, a latch-arm secured to said armature and adapted to engage the drop, contact-posts at the respective sides of said jack, a rear  
65 block, plates connecting said blocks, a socket-piece in the rear block, in which the end of

the jack is mounted, a contact-arm secured to said jack and adapted to engage said contact-posts when the jack is oscillated in one direction or the other, and means for removably securing the rear block to the back of the switchboard, substantially as set forth. 70

12. The combination with a magnet, its armature, a drop, and a latch attached to the armature and adapted to engage the drop, of  
75 an oscillatory jack, a switch included in circuit with said magnet, a contact-arm on the jack, a contact-post to be engaged by said contact-arm, said contact-post being included in circuit with a generator, and an arm de-  
80 pending from the jack and adapted to open said switch whereby to open-circuit the circuit through the magnet when the contact-arm on the jack engages the contact-post including the generator, substantially as set  
85 forth.

13. In a switchboard, the combination with a magnet and a drop, of an armature for said magnet, a latch-arm secured to said armature and adapted to engage the drop, and a loosely-  
90 pivoted arm connected with said latch-arm and adapted to be vibrated when the latch-arm is vibrated, whereby to attract the attention of the operator, substantially as set forth.

14. In a switchboard, the combination with  
95 an open frame and a back, of insulated blocks supported in said open frame, insulated blocks removably secured to said back, plates connecting said blocks a magnet and a jack mounted between said blocks, a drop sup-  
100 ported by one block and contact-posts supported by the other block, and a connection between the armature of the magnet and the drop, substantially as set forth.

15. The combination with a jack, of a drop  
105 hinged at its lower edge above the socket of the jack and adapted to swing downwardly and assume a horizontal position, electromagnetic devices constructed to maintain said drop normally in its raised or closed position,  
110 a block or enlargement on the outer face of said drop adapted to overhang the jack-socket when the drop falls to a horizontal position, and a plug constructed to engage said block or enlargement and return the drop to the  
115 latch devices, substantially as set forth.

16. The combination with a jack and a block or head at one end thereof, of a drop hinged at its lower edge to said block at a point above the socket of the jack, an enlargement on said  
120 drop adapted to overhang the jack-socket when the drop falls and a plug constructed to engage said enlargement when it is inserted into the jack, whereby to return the drop, substantially as set forth. 12

17. The combination with a jack having a socket therein, of a hinged drop adapted to assume a horizontal position when it falls, a block or enlargement on said drop adapted to overhang said socket when the drop falls,  
130 electromagnetic devices for retaining said drop in normal position and a plug having a



handle or shoulder to engage said block or enlargement and return the drop, substantially as set forth.

18. In a switchboard, the combination with  
5 a support and contact devices attached thereto, of a series of structures, each structure comprising a frame and jack, drop devices and cooperating contact devices supported by said frame and fastening devices passing  
10 through the support to independently and removably secure each structure to the support with the respective contact devices in juxtaposition.

19. In a switchboard, the combination with  
15 a support and contact devices attached thereto, of a frame, the switch and drop devices for a subscriber's line supported by and attached to said frame, contacts secured to said frame and electrically connected with said  
20 switch and drop devices, and a fastening device securing said frame to the support so as to cause the contact devices on the frame to engage the contact devices on the support, said fastening device serving also as a con-  
25 tact device for a subscriber's line.

20. The combination with a spring-jack, of a series of contacts connected to a supporting-

piece associated with said jack, a series of opposed contacts connected with a supporting-  
30 piece to which the jack is attached and a screw engaging both of said supporting-pieces whereby to hold the contacts on one supporting-piece in engagement with the contacts on the other supporting-piece, said screw also  
35 constituting a connecting device for a subscriber's line-wire, substantially as set forth.

21. In a switchboard, the combination with a support and contact devices attached thereto, of a series of structures, each structure  
40 comprising a frame and jack, drop devices and cooperating contact devices corresponding to a single subscriber's line supported by said frame and suitable fastening devices to independently and removably secure each  
45 structure as a whole to the support with the respective contacts in juxtaposition.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JAMES M. OVERSHINER.

Witnesses:

ARTHUR V. OVERSHINER,  
W. Y. CHAPIN.