No. 684,202. Patented Oct. 8, 1901.

A. DURBIN.

LOCK-OUT DEVICE FOR TELEPHONE SYSTEMS.

(Application filed Feb. 13, 1901.)

(No Model.)

Fig. 1.

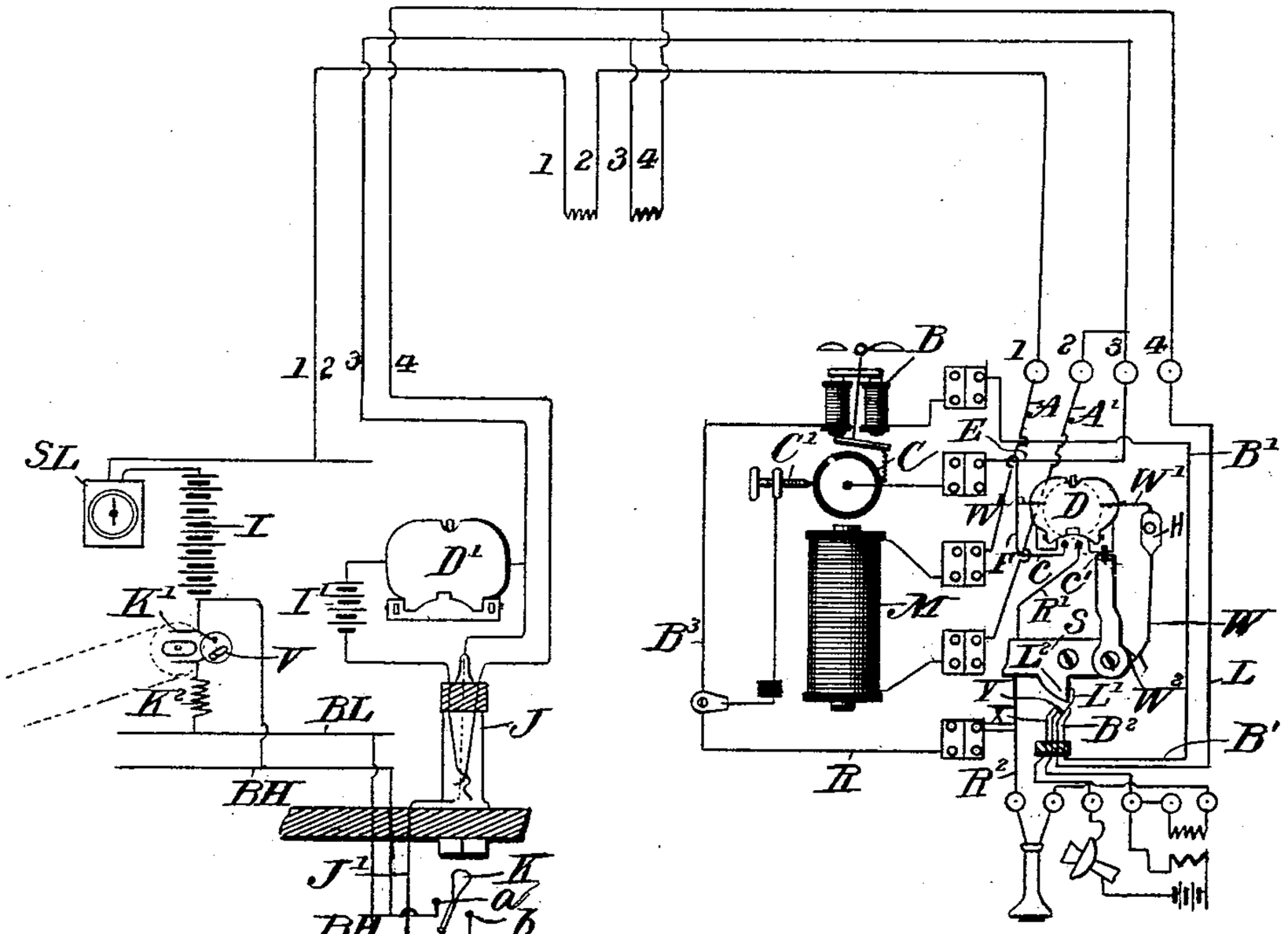


Fig. 2.

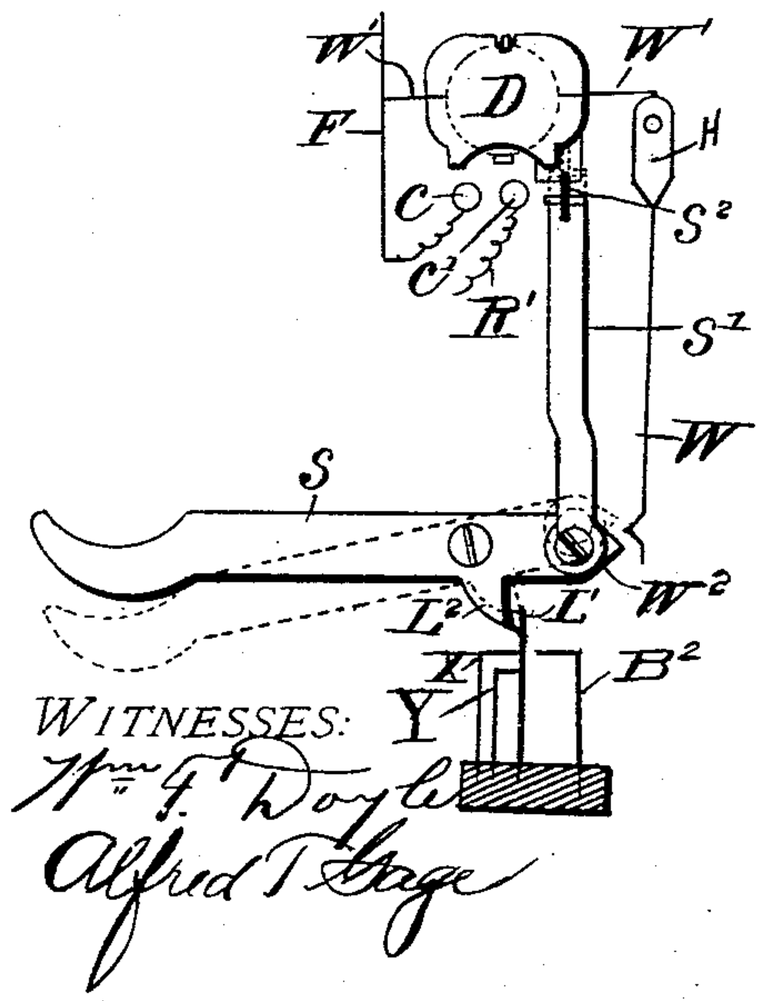
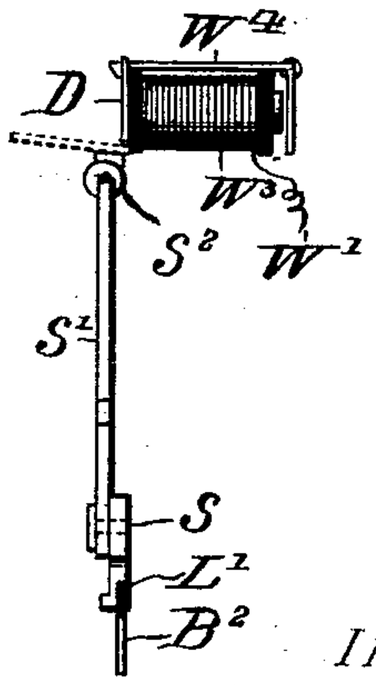


Fig. 3.



WITNESSES:
Wm. F. Doyle
Alfred T. Stage

INVENTOR
Alfred Durbin
BY E. B. Stocking
Attorney

UNITED STATES PATENT OFFICE.

ALFRED DURBIN, OF McCONNELSVILLE, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE UNITED STATES ELECTRIC MANUFACTURING COMPANY, OF BUTLER, PENNSYLVANIA.

LOCK-OUT DEVICE FOR TELEPHONE SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 684,202, dated October 8, 1901.

Application filed February 13, 1901. Serial No. 47,153. (No model.)

To all whom it may concern:

Be it known that I, ALFRED DURBIN, a citizen of the United States, residing at McConnelsville, in the county of Morgan, State of Ohio, have invented certain new and useful Improvements in Lock-Out Devices for Telephone Systems, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to lock-out devices for telephone systems, and is shown in the present case as applied to a selector system, to which it is particularly applicable.

The invention has for an object to provide a lock-out device by means of which all parties upon the line except the central office and the subscriber or the two connected subscribers are prevented from using the line when the device is operated.

A further object of the invention is to provide means by which the drop comprising the lock-out device may be automatically operated by the regular signaling-current on the line and which serves to connect the receiver and transmitter to the line, said drop being automatically restored in the movement of the switch-hook when the receiver is placed thereon.

A further object of the invention is to provide means in connection with a selector system by means of which the contact device in the system may be used as a transmitter of speech when in proper position, thus preventing the closing of the circuit through any other selector device in a subscriber's telephone which has not been previously set from the central office.

Other objects and advantages of the invention will hereinafter appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a diagrammatic illustration of the lock-out device applied to a selector system. Fig. 2 is a front elevation of the drop and means for operating the same, and Fig. 3 is a side elevation of the same parts.

Like characters of reference indicate like parts throughout the several figures of the drawings.

For the purpose of illustrating the application of the present invention in connection with a selector system, I have shown in the present case the form and general arrangement of selector and other parts disclosed in the patents to Thomas C. Drake, No. 599,322, of February 22, 1898; No. 605,309, of June 7, 1898; No. 605,688, of June 14, 1898, and No. 632,669, of April 11, 1899, although the lock-out device will be equally applicable to other systems.

The drawings illustrate at the left the central office and at the right the detail arrangement for the subscriber's telephone at the end of the line, while intermediate of these the position of another subscriber has been indicated. Referring to the line-wires, of which three are used in the system shown, the terminals 1 and 2 are the selector-terminals, which are connected by wiring A and A′, respectively, as shown by dotted lines with the selector-magnet M. As just stated, the subscriber shown is at the end of the line, and the return-circuit from the magnet is consequently taken from the terminal 2 to the terminal 3, as the use of the line-wire 3 has been found more satisfactory that the use of a ground return. The other telephones in the circuit are connected as heretofore—that is, the selectors 1 and 2 in series and the receiver and transmitter lines in multiple. Beginning with the terminal line-wire 3 at the subscriber's end of the line the circuit is carried by means of the wire E and branch F to a contact *c*, located beneath the drop D, as will be hereinafter described. The circuit at this point is open. A separate branch circuit W′ is connected to the wire F and extends through the winding for the drop-magnet, thence to the contact-plate H, connected with the wiping-contact W, adapted in the movement of the switch-lever to engage the point W^2 thereof, but shown in Fig. 1 with the circuit open. Returning to the wire E, the circuit extends beyond the branch F through the hinge in the usual manner to the selector contact-disk C, which is shown as in

open circuit. The main line 4 is connected with the receiver and transmitter by means of the wire L, extending from the terminal and having a switch-contact L′, adapted to engage a projection L^2 from the switch-hook, by which it is forced into engagement with the contact B^2, from which the circuit B′ extends through the ringers or usual polarized bells B and line B^3 to the contact-point C′ opposite the selector-disk C, which contact is shown in open circuit. Beyond the branch wire for this contact C′ the line-wire is extended, as at R, and after passing through the hinge is divided into a branch R′, extending upward to the contact *c*′, coöperating with the contact *c* beneath the drop D, while the branch R^2 extends through the receiver and induction-coils to the switch-contact Y, which is shown in open circuit and in relation to which the contact X for the transmitter is also disposed in the usual manner.

Referring now to the central office, it will be seen that the usual jack J is connected with the line-wires 3 and 4, and when the operator inserts the plug therein the signal-battery I′, connected through the drop D′ with the lines 3 and 4, is cut off. This jack is also connected with a key K, by an oscillation of which an interrupted current may be sent through the selector-line 1 to rotate the disk C of the subscriber's telephone in the usual step-by-step manner until the contact C′ reaches the proper point to close the circuit therethrough. The portions of the central-office equipment shown in the diagram are only those necessary for the operation of the present invention and comprise the selector device S L, connected with the selector-line 1, to which device all the selector-lines under the control of one operator are connected. The path of the current is through this device and also the selector-battery I, where the line is branched for the purpose of carrying the direct connection to the wire B H, which furnishes the necessary strong current for restoring the selector device in the subscriber's telephone. The other circuit is carried through a make-and-break contact K′, adapted to be continuously rotated by any desired power, and through a resistance K^2 to line B L, which furnishes all lines with a light or weaker current for the selector operation. The lines B L and B H extend to the key K and are provided with suitable contacts *a* and *b*, respectively, while the key K is in circuit with the line J′, extending to the jack J. It will thus be seen that if the key be in contact with the point or terminal *b* a light interrupted current will be passed through the line, while if it is in contact with the terminal *a* a heavier current is transmitted from the line B H. If the key be released and in the middle position, both circuits are open. If for any reason it be desired not to use the constantly make-and-break contact K′, a switch V may be provided, by means of which the contact device will be cut out and the interrupted current may be attained through an oscillation of the lever K, so as to accomplish the stepping action in the operation of the selector device.

The drop mechanism used in connection with this invention comprises an ordinary telephone-drop of the same resistance as the one used in the central office and controlled by any desired form of magnet—for instance, as shown at W^3—having the pivoted latch W^4, adapted to engage the drop-plate D. This magnet is in circuit with the line W′ and wiping-contact W, while beneath the drop the contact-points C and C′ are respectively connected to the line-wires F and R′. When the drop D is released from the magnet and falls, circuit is established through these contacts and the wires mentioned. For the purpose of restoring the drop the lever S′ is pivotally connected at the end W^2 of the switch-lever S and provided at its upper end with an insulating-roll S^2, adapted to contact with the drop-plate D, which is pivoted at its lower portion, and raise the same to engage the latch W^4. This operation is effected when the weight of the receiver is placed upon the extended end of the switch-hook, and so long as the receiver is in position on the hook the drop will be held in a raised position. As soon as the receiver is removed from the hook the end thereof carrying the lever S′ drops downward, thus permitting the drop-plate to fall upon the contacts as soon as the same is released by the proper current from the central office.

In the operation of the invention when the central office desires to call a subscriber the usual plug is inserted in the jack J, cutting off the signaling-battery I′ and connecting lines 3 and 4. An interrupted current is then sent from the selector-line I either through the medium of the make and break K′ or the lever K, which rotates the contact-disk until contact is made with the point C′ The central office then rings, the circuit being closed through line 3, wire E, contacts C and C′, line B^3, bells B, thence to line B′ and through switch-contacts B^2 and L′, thence over the line L to the terminal of main line 4. The bell having been sounded, the subscriber removes the receiver, thus opening the ringer-circuit at B^2 and closing the switch-contact between L′ and Y, which permits the subscriber to answer the call through contacts C and C′ of the selector device and lines R and R^2 through the receiver and transmitter to the main-line terminal 4. When the parts are in this position, it will be seen that the circuit is not closed through any other instrument on the line nor can it be, because the contacts C and C′ for each selector device are all set for different positions. If a subscriber desires to call the central office, the plug must be removed from the jack J—that is, the line must be idle in order that the signal-battery I′ may be in circuit. The subscriber lifts the receiver from the switch-hook

and the movement of the latter effects a wiping-contact at W to make circuit temporarily through the line L L', hook S, contact W, and wiring W' for the drop D, thence through the line E to the terminal of line-wire 3. This current through the drop D of the subscriber and the drop D' of the central office by reason of the battery I' at the central releases both drop-plates, calling attention of the central office to the subscriber's call and closing of the circuit through the contacts *c* and *c'* of the subscriber, thus placing the receiver and transmitter in circuit through the lines E and F, together with the contacts beneath the drop-plate and the lines R' R^2, thence through the receiver and transmitter and switch-contacts Y and L' and line L to the terminal of main line 4. It will thus be seen that on a call from the central office the speaking is effected through contacts of the selector device, while upon a call from the subscriber to central the speaking is effected through the drop-plate and the contacts beneath the same.

This lock-out device effectually prevents more than one subscriber being connected to the line at a time, except by operation of the selector device at the central office, which enables a second party to be connected. The invention also presents an instrument containing a drop, which is automatically thrown by means of the regular signaling-current on the line and serves to connect the receiver and transmitter in circuit, said drop being automatically restored by means of a lever attached to the switch-hook and operated by the weight of the receiver upon said hook. The drop when in use prevents a second person from listening to any conversation upon the line or interrupting the user by sending a call over the wire, as when the drop has fallen the signal-circuit is inoperative to all other subscribers. It will also be obvious that the use of the contact device of the selector system for speaking purposes presents a connection by means of which any subscriber upon a party-line may be placed in communication with the central office exclusive of all other subscribers on the same line. The lock-out also presents the advantage that the bridges across the line are only of a temporary character and the signal-bell does not ring at any save the subscriber selected by the central office. It will also be evident that two subscribers upon the same or different lines may be placed in communication with each other by the usual mechanism employed for that purpose.

It is obvious that changes may be made in the details of construction and configuration of the several parts and the disposition of the current-conducting means or wires without departing from the spirit of the invention as defined by the appended claims.

Having described my invention, what I claim is—

1. A lock-out device for telephone systems comprising a bridging-drop, contacts beneath the same in circuit with a receiver and transmitter, means for retaining said drop in a raised position, means controlled by the movement of a receiver-support for temporarily and automatically establishing circuit through the drop-retaining device for releasing the same; and means carried by said receiver-support and insulated from said drop for mechanically restoring the same to a raised position; substantially as specified.

2. In a telephone system, a selector device comprising a disk and contact-point, means controlled by the central office for operating said device, a drop device and contact in the circuit to said selector, and means controlled by the subscriber for establishing circuit through said drop device and contacts and the receiver and transmitter independent of said selector; substantially as specified.

3. A lock-out device comprising a bridging-drop or relay, electrically-controlled means for releasing the same, circuit-contacts beneath said drop, a pivoted receiver-support, and a lever carried by said support beneath the drop and having an insulated face to connect therewith in its movement for restoring said drop to a raised position; substantially as specified.

4. In a telephone lock-out device, a central-office signal device and circuit, a receiver-support, a bridging drop-plate and contacts for establishing circuit through a receiver and transmitter, means carried by the receiver-support for establishing a temporary contact with said signal-circuit; and means carried thereby to subsequently operate a switch-contact between the drop-plate circuit and a main line; substantially as specified.

5. A telephone instrument containing a drop adapted to be automatically thrown by a signal-current on a line, a selector device in circuit with the signal-line, contacts beneath said drop for establishing circuit through a receiver and transmitter, means controlled by a switch-hook for releasing said drop and cutting out said selector, and means for automatically restoring said drop when the receiver is returned to a support therefor and establishing circuit through said selector; substantially as specified.

6. In a telephone instrument, a selector device comprising a disk and contact-point, a selector-magnet to operate said disk in circuit with a selector-line, a switch-hook arranged to release a drop device to establish circuit through a receiver and transmitter when the receiver is removed from said hook, and means controlled by said hook for restoring said drop and establishing circuit through the selector; substantially as specified.

7. A telephone lock-out device comprising a pivoted switch-hook, a lever pivoted thereto and extending above the same, a bridging drop-plate pivoted at one edge above said lever, circuit-contacts in the path of travel of said plate, and a contact-roller on said lever and insulated therefrom to traverse the face

of said plate in the upward movement of said lever; substantially as specified.

8. A telephone lock-out device comprising a pivoted switch-hook, a lever extending above the same, a drop-plate above said lever and adapted to be engaged in the upward movement of said lever; electrically-controlled means for retaining said drop-plate in an elevated position, and a wiping contact adapted to momentarily establish circuit through said electrically-controlled means during the movement of the switch-hook; substantially as specified.

9. A telephone lock-out device comprising a pivoted switch-hook, a lever extending above the same, a drop-plate above said lever and adapted to be engaged in the upward movement of said lever, electrically-controlled means for retaining said drop-plate in an elevated position, a wiping contact adapted to momentarily establish circuit through said electrically-controlled means during the movement of the switch-hook, an insulating-contact at the upper end of the restoring-lever, and a contact device beneath said drop-plate adapted to establish circuit through the receiver and transmitter; substantially as specified.

10. A telephone system comprising electrically-controlled drops or relays at the central office and subscriber, a signal-battery in circuit with the same, means for temporarily establishing circuit through the central drop and the subscriber's drop, and contacts controlled by the movement of said drop to establish circuit through a receiver and transmitter; substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

ALFRED DURBIN.

Witnesses:
E. M. KENNEDY,
P. H. TANNEHILL.