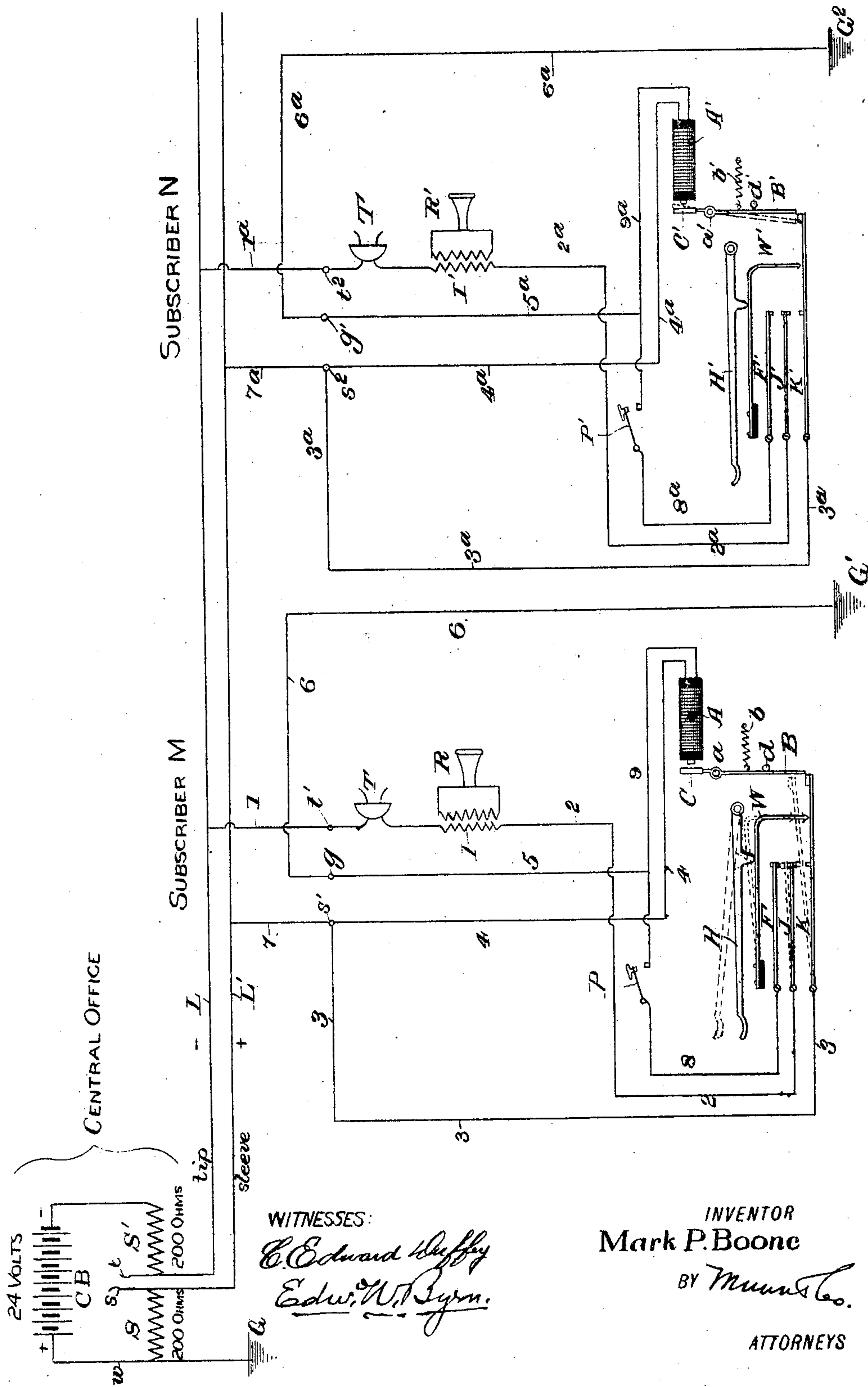


No. 798,561.

PATENTED AUG. 29, 1905.

M. P. BOONE.
COMMON BATTERY LOCK-OUT TELEPHONE.

APPLICATION FILED APR. 11, 1905.



WITNESSES:

E. Edward Ruffey
Edw. W. Rym.

INVENTOR
Mark P. Boone

BY *Munn & Co.*

ATTORNEYS

UNITED STATES PATENT OFFICE.

MARK P. BOONE, OF PERU, INDIANA.

COMMON-BATTERY LOCK-OUT TELEPHONE.

No. 798,561.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed April 11, 1905. Serial No. 254,934.

To all whom it may concern:

Be it known that I, MARK P. BOONE, a citizen of the United States, residing at Peru, in the county of Miami and State of Indiana, have invented a new and useful Improvement in Common-Battery Lock-Out Telephones, of which the following is a specification.

My invention is in the nature of a lock-out device designed for common-battery party-line telephones, whereby all parties are locked out except those properly using the line, so that the conversation may not be overheard by others on the line. It is applicable to any common-battery system which has one side of the battery grounded and has impedance-coils interposed between the opposite poles of such battery and the two line-wires at all times.

My invention consists in the novel construction and arrangement of the electromechanical parts and their coöperating circuits, in which when the line is clear and no party is talking a lock-out electromagnet at a subscriber's station connected between the earth and a wire leading through an impedance-coil to one side of the battery will be inoperative; but if a circuit be established between the two lines (through a telephone bridged on the line, for instance) then all the subscribers' lock-out electromagnets connected as described become operative to lock-out.

It also consists in the combination, with said circuit and electromechanical parts, of a special push-button and supplemental circuit leading to ground at the subscriber's station to enable a subscriber to communicate with another on the same line when the call is for a subscriber on the same line, all as hereinafter more fully described with reference to the drawing, in which—

The view represents a diagrammatic illustration of two subscriber's stations on the same party-line, together with such portions of the central-office equipment as are necessary to explain the coöperative relation.

In the drawing, C B represent the common battery of the central office. The positive side of the battery is connected by a wire *w* with the ground G. This side of the battery is also connected, through an impedance-coil S, to the sleeve-contact *s* of the jack which leads to the line-wire L'. The negative side of the battery is connected, through an impedance-coil S', to the tip-contact *t*, which leads to the line-wire L. The resistance of the two impedance-coils S S' is the same. As shown, it is two hundred ohms, while the

battery is of twenty-four volts. The two wires L and L' represent one of the party-lines and extend to the instruments of all the subscribers on that party-line.

All the subscribers' instruments are equipped alike, of which I have shown only two—one at M and the other at N. Each is constructed and arranged alike as follows, reference being had to station M: H is the receiver-hook, F J K are spring-contacts with platinum points at their meeting ends. A toe on the bottom side of the receiver-hook rests upon a spring W, whose downwardly-bent end presses upon the extended end of the spring-contact K and when the weight of the receiver is on the hook holds the contact-spring K away from J and allows J also to spring out of contact from F, which represents the open position of the line. If, however, the receiver is removed from the hook H, the tension of spring W lifts the receiver-hook and rising from contact-spring K allows the latter in turn to rise and to come into contact with J and also to force J into contact with F, as shown by dotted lines.

The connections from the line are made as follows: line-wire L to 1, to binding-post *t'*, transmitter T, induction-coil I, wire 2, and contact-spring J; from line-wire L', wire 7 to binding-post *s'*, and wire 3 to spring-contact K; from binding-post *g* by wire 6 to ground G' and from binding-post *g* into the instrument through wire 5, wire 9, electromagnet A, wire 4, binding-post *s'*, wire 7, and the positive side L' of the line; from spring-contact F to wire 8, push-button P, to wire 9 of the circuit of the electromagnet. This electromagnet controls the lock-out devices and circuits, as follows: C is an armature mounted in front of the electromagnet upon a locking-lever B, fulcrumed at *a* and normally held against a stop *d* by a spring *b*. When so held, the armature C on the upper end of the lever is removed from the pole of the electromagnet, and the lower end of the locking-lever is removed from range of interference with the rise of the extended end of contact-spring K, so that said contact-spring can rise past the lower end of said locking-lever to close the contacts F J K, as shown in dotted lines, whenever the receiver is taken off the hook; but if the electromagnet A be energized then the armature is attracted and the locking-lever is deflected, as seen in dotted lines at station N, and the lower end of the locking-lever passes above the extended end of contact-spring K'

and prevents its rise, so that even if receiver H' of this other station is taken off the hook the contacts F' J' K' are not closed for talking or hearing. The full-line positions represent the positions of the parts when the line is not in use. Now if station M is in use a potential is set up between the sleeve side of line and the earth, which does not exist when station M is not in use. I take advantage of this difference in potential to operate the lock-out electromagnet A' of station N and all other stations on this line. A portion of the current will go to the positive side of the battery at central office through impedance-coil S and part over the line-wire L' to the high-resistance electromagnets A' of the other station, as follows: from negative side of battery, impedance-coil S', tip-spring *t*, line-wire L, wire 1, (of station M,) binding-post *t'*, transmitter T, induction-coil I of receiver R, wire 2, contact J, and (receiver being off hook and J and K touching) contact K, wire 3, binding-post *s'*, wire 7, to line L', and here the current divides and goes part to the left to central office and part to the right to the other subscribers' stations. Toward the left it goes to sleeve-contact *s* and impedance-coil S to positive or ground side of battery. The other portion of the current, passing from 7 to the right on line L', goes to station N, (and all others,) as follows: by wire 7^a, binding-post *s*², wire 4^a, electromagnet A', wire 9^a, wire 5^a, binding-post *g'*, wire 6^a to ground G² and back to central office, ground G, and wire *w* to join the other portion of current of the same polarity into the positive side of battery. The effect of this portion of the current which goes to all the other subscribers N on the line is to energize electromagnets A' and by attracting armature C' throw the locking-lever B' over the extended end of spring K' and by preventing the closure of contacts F' J' K' cuts out all these other telephones from talking or hearing. If it happens that the subscriber M wishes to communicate with another, N, on the same party-line, this is accomplished through the agency of the push-button P, as follows: The subscriber M first gives to central office the number of N's telephone. Central office then rings N, after which M presses his button P, and this grounds the circuit and cuts out or deenergizes the lock-out electromagnets A' of all other subscribers, so that their contacts F' J' K' may come in contact upon removal of the receiver from the hook. The circuit over which the push-button acts in deenergizing magnets A' is line L, wire 1, binding-post *t*, transmitter T, induction-coil I, wire 2, contact J, contact F, wire 8, push-button P, wire 5, binding-post *g*, wire 6, and ground G'. Subscriber N having answered, subscriber M releases push-button P, and this again locks out all the other subscribers on that line except N. N's electromagnet is by this act en-

ergized, and his instrument would be locked out but for the fact that his spring K' has risen in front of lever B', as shown by dotted lines at station M, and his lever B' cannot get on top of it to interfere with its already-closed circuits. For ringing purposes this is to be accomplished by any of the selective ringing devices, and by using the Dean four-frequency harmonic system on either wire to ground eight parties may be rung selectively.

In brief recapitulation of the operation of my lock-out telephone the following shows the sequence and effects of the several operations. Subscriber M calls central office, and the act of taking down his receiver cuts out all other subscribers on his line. If calling subscriber wants another, N, on same line, after this other subscriber N is called by central office by a selective bell the subscriber M presses button P and opens the locking device of called subscriber N, (and all others temporarily.) After called subscriber N takes his telephone off the hook then calling subscriber M, releasing push-button, allows all the subscribers on that line to be locked out again; but, with subscribers M and N, although their locking-out magnets are energized, their contact-springs K and K' have risen to a point beyond the locking-out detent-lever, which position establishes the operative circuits for communication between the two subscribers.

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

1. A lock-out telephone system for party-lines, comprising a common battery having one of its poles grounded at the central office, two line-wires connected respectively to the tip and sleeve contacts of the central-office jack, two equal impedance-coils connecting said tip and sleeve contacts respectively with opposite sides of the battery, and a subscriber's instrument having two normally open talking-contacts, and a receiver-hook for holding said contacts open from the weight of the receiver, one of said contacts being connected to one of the line-wires through the transmitter and induction-coil of the receiver, and the other contact being connected to the other line-wire as described and arranged to divide the current flowing to the ground side of the battery at the central office, one part going to said ground side of battery through an impedance-coil, and the other part going to ground at subscribers' stations, a lock-out electromagnet arranged between the last-named line-wire and the ground at each station and lock-out devices for holding the talking-circuit contacts open by the action of the said electromagnets substantially as described.

2. A lock-out telephone system for party-lines, comprising a common battery having one of its poles grounded at the central office, two line-wires connected respectively to the

tip and sleeve contacts of the central-office jack, two equal impedance-coils connecting said tip and sleeve contacts respectively with opposite sides of the battery, and a subscriber's instrument having two normally open talking-contacts, a receiver-hook, means for causing the weight of the receiver to hold the talking-contacts open, one of said talking-contacts being connected through the transmitter and induction-coil of the receiver to one of the line-wires, and the other talking-contact being connected to the other line-wire and arranged to divide the current flowing to the ground side of the battery at central office, one part going to said ground side of battery through an impedance-coil and the other part going to ground at subscribers' stations, a locking-electromagnet arranged in circuit between the latter line-wire and the ground of each subscriber, and an armature with detent for holding said talking-contacts open, whenever the circuit of said electromagnet is grounded substantially as described.

3. A lock-out telephone system for party-lines, comprising a common battery having one of its poles grounded at the central office, two line-wires connected respectively to the tip and sleeve contacts of the central-office jack, two equal impedance-coils connecting said tip and sleeve contacts respectively with

opposite sides of the battery, and a subscriber's instrument having three normally open contacts, a receiver-hook for holding said contacts open from the weight of the receiver, two of said contacts being in the talking-circuit, one of them being connected to one of the line-wires through the transmitter and induction-coil of the receiver, and the other contact being connected to the other line-wire to divide the current flowing to the ground side of the battery at central office, one part going to said ground side of battery through an impedance-coil, and the other part going to ground at subscribers' stations, a lock-out electromagnet arranged between the last-named line-wire and the ground at each station, a lock-out device for holding the locking-circuit contacts open by the action of said electromagnet, and the third contact of each subscriber's instrument being connected to the ground-wire of each subscriber's station and having a circuit-closer therein to short-circuit and cut out the locking-electromagnet for securing intercommunication between subscribers on the same party-line substantially as described.

MARK P. BOONE.

Witnesses:

CHAS. P. ECKSTEIN,
JOHN G. MILLER.