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W. M. BRUCE, JR.

PATENTED FEB. 4, 1908.

LOCK OUT DEVICE FOR PARTY LINE TELEPHONES.

APPLICATION FILED FEB. 15, 1906.

2 SHEETS—SHEET 1.

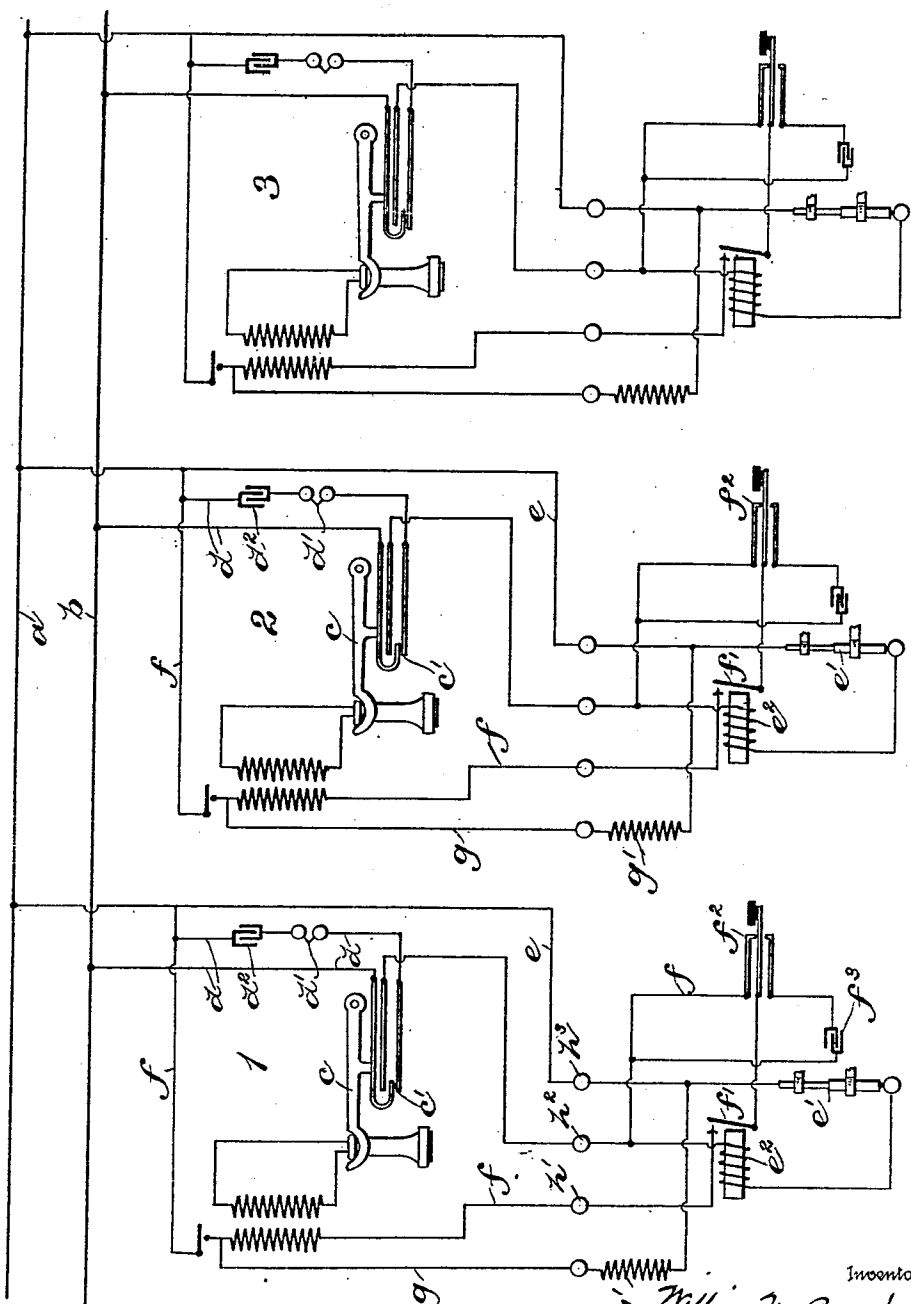


Fig. 1.

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By [Signature]
Attorney

179. TELEPHONY,

Systems,

Polystation lines, Lockout,

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Draftsman.

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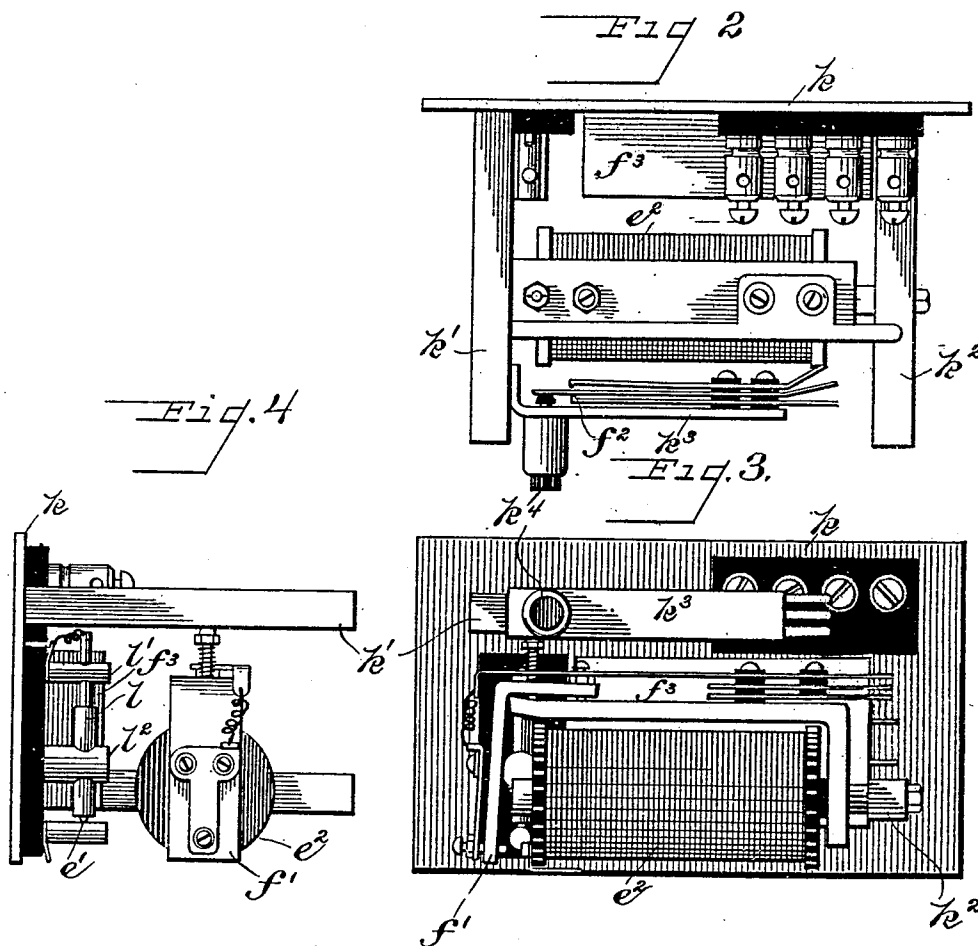
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Inventor

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UNITED STATES PATENT OFFICE.

WILLIAM M. BRUCE, JR., OF SPRINGFIELD, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE AMERICAN AUTOMATIC TELEPHONE COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION OF NEW YORK.

LOCK-OUT DEVICE FOR PARTY-LINE TELEPHONES.

No. 877,901.

Specification of Letters Patent.

Patented Feb. 4, 1908.

Application filed February 15, 1906. Serial No. 301,207.

To all whom it may concern:

Be it known that I, WILLIAM M. BRUCE, Jr., a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Lock-Out Devices for Party-Line Telephones, of which the following is a specification.

My invention relates to improvements in lock out devices for party line telephones, the invention being particularly adapted for use with common battery metallic circuit telephone systems, the object being to provide an arrangement and construction of parts such that any number of subscribers may be placed on a single line, and that when one subscriber removes his telephone for use all the other subscribers will be automatically locked out and cannot come into or use the line, or hear the conversation on the line, until the subscriber using the line has released the same, the construction being such that this is accomplished without the use of ground connections.

My invention consists in the arrangement and construction of parts hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1 is a diagrammatic view representing a single metallic circuit telephone line to which are attached three subscribers' stations, the line being adapted to be connected to a central station supplied with a common battery, in the usual manner. Figs. 2, 3 and 4 represent respectively a top, side and end view of the mechanism contained in a single box or casing which constitutes the instrumentalities that are used with the ordinary subscriber's outfit and connected up in the manner hereinafter described to attain the object of the invention. The outer covering of this device is shown removed.

In the said drawings, *a* and *b* represent the respective sides of the main telephone line.

The several subscribers' stations are marked 1, 2 and 3 in the diagrammatic view, and at each station *c* represents the ordinary telephone hook, and *c*¹ a switch adapted to be operated thereby. *d* represents a bridge across the line, normally including the bell, *d*¹ and condenser *d*², constituting the ringing circuit, which bridge is closed at the switch, *c*¹, when the telephone is on the hook. *e* represents a bridge including a circuit breaker,

*e*¹, and a relay, *e*², which is adapted to be bridged across the line by the operation of the switch, *c*¹, when the telephone is removed from the hook, *c*, the switch, *c*¹, being adapted to make contact with the circuit, *d* or *e* when in different position in a well known manner. The talking instruments are in a normally opened bridge, *f*, which is adapted to be closed by the operation of the relay, *e*², on the circuit closer, *f*¹, in said bridge. This talking circuit also includes a circuit breaker, *f*². I also provide a shunt *g*, around the subscriber's talking instrument, which shunt includes a definite resistance *g*¹.

In the practical use of these devices, I construct the relay, *e*², with the circuit breaking switch, *f*¹, and the shunt, *g*, and the circuit breakers, *e*¹ and *f*², combined in the same instrument, as shown in Figs. 2, 3 and 4, and which is adapted to be connected to the subscriber's station by binding posts, *h*¹, *h*² and *h*³, all of the electrical connections not being shown in the drawings of the instrument. This instrument consists of a base, *k*, having supporting standards, *k*¹ *k*². The coil for the relay, *e*², and the resistance, *g*¹, are wound together, that is, the resistance, *g*¹, is wound about the coil of the relay, *e*², thus condensing the space required. The circuit breaker, *f*², is attached to the standard, *k*¹, by means of a supporting arm, *k*³, and is provided with a push button, *k*⁴, which extends through the outer casing or covering (not shown) which incloses all of the mechanism. The circuit breaker, *e*¹, is located near the end of the base *k*, and consists of a sliding rod, *l*, supported in suitable standards, *l*¹ *l*², and is adapted by gravity to maintain electrical connection with the relay *e*².

By removing the telephone from the hook, *c*, a bridge is established across the line through the circuit, *e*, including the binding posts, *h*² *h*³, relay, *e*², and circuit breaker, *e*¹, at the same time the ringing circuit is disconnected. Current flows from the central energy through this bridge, and causes the relay to operate the circuit closer, *f*¹, which is held closed so long as the current passes through the relay. The closing of the relay establishes the talking circuit through the circuit, *f*, which circuit also includes the shunt and permanent resistance *g* and *g*¹. The resistance of this talking circuit and the relay is such that the current from the cen-

tral station will be utilized thereby, to such extent that in the event that any other subscriber should remove his telephone, there would not be sufficient current pass through his relay to operate the same, although the current would be sufficient to hold the circuit closer closed in the event it had been operated.

Experience has shown that the resistance of the talking circuit and the relay even without the shunt and permanent resistance g and g^1 will, under ordinary conditions utilize the current to such an extent that the relay of another subscriber will not operate. It sometimes happens, however, that the resistance of the talking circuit is increased by the operation of the talking instruments, and this is particularly true in case of loud talk or a sudden impact against the diaphragm of the transmitter, and hence it might sometimes happen that if a subscriber should remove his telephone at the moment that another subscriber using the line had, by loud talk or otherwise, increased the resistance of his talking circuit, the increase of resistance at the station used might be such as to cause the relay of another subscriber to operate. Hence the shunt, g , with the permanent resistance, g^1 , is employed around the talking instrument which maintains a sufficiently low resistance of the circuit at all times to cause the amount of current passing through the same to prevent the possibility of a relay at another subscriber's station from being operated by any largely increased resistance caused by the subscriber holding the line in the use of his instruments. It was also possible in some cases by pounding on the relay when the line was in use by one subscriber to cause the circuit closer, f^1 , from another subscriber's relay to be operated, and thus bring such subscriber on the line. To prevent this, I have incorporated within the same supporting casing or mechanism with the relay and its circuit closer a gravity circuit breaking switch, e^1 , which is sufficiently sensitive that any pounding of the instrument which would effect the operation of the circuit closer, f^1 , will simultaneously operate the circuit breaker, e^1 , and thus rob the relay, e^2 , of the current by opening the circuit at this point and preventing the circuit closer, f^1 , from being held in the closed position.

The circuit breaker, f^2 , in connection with the condenser, f^3 , is used for the purpose of permitting another subscriber to come in on the same line when the subscriber first calling so desires. The pressing of the button, k^4 , cuts out the subscriber's talking instruments in the circuit, f , and establishes another circuit through the condenser, f^3 . This will permit the subscriber to hear the conversation with the second subscriber through the condenser, f^3 , but will prevent the flow of

current through his talking circuit, thus permitting sufficient current to pass through the line to operate a second relay, and after the connection with the second subscriber has been established, by releasing the button, k^3 , his own instruments are again brought into circuit so that a conversation may be had between two subscribers on the same line.

The permanent shunt around the transmitter herein described not only insures a substantially uniform flow of current which will prevent the operation of a second relay on a party line system, but it also has the effect of decreasing what is generally known as "side tones" in the subscriber's talking instruments.

Having thus described my invention, I claim:

1. In a common battery party line telephone system, an electro-magnet at each subscriber's station means for bridging the same across the line, a normally open shunt around the said electro-magnet including the subscriber's talking instruments, and a circuit closer in said shunt adapted to be operated by said relay, and a second shunt having permanent resistance around said talking instrument, the resistance of said second shunt and the relay being such as to utilize the current from the central energy, and prevent any other relay on the line from being operated.

2. In a central energy party line telephone system, a series of stations including talking instruments, a main switch, a relay adapted to be bridged across the line by the operation of the main switch, a shunt around the relay including the subscriber's talking outfit, and a shunt around the talking outfit having a permanent resistance, and a circuit closer adapted to be operated by the electro-magnetic force of said relay to bring said talking outfit and the permanent shunt thereof into circuit, said relay being of greater resistance than the resistance of said shunt around the talking outfit, whereby the operation of the one relay and the talking circuit will prevent the operation of any other relay on the line.

3. In a common battery party line telephone system, a relay at each subscriber's station means for bridging the same across the line, a shunt around said electro-magnet including the subscriber's talking instruments, a circuit closer in said shunt adapted to be operated by said relay, and a circuit breaker also in said shunt and associated with said relay, so that any jarring of said relay will operate said circuit breaker, substantially as and for the purpose specified.

4. In a common battery party line telephone system, an electro-magnet at each subscriber's station means for bridging the same across the line, a shunt around said electro-magnet including the subscriber's talking instrument, a circuit closer in said

shunt adapted to be operated by the electro-magnetic force of said relay, and a gravity switch or circuit breaker associated with said relay, and also in said shunt, substantially as and for the purpose specified.

5 5. In combination with a subscriber's outfit for a central energy party line telephone system, a relay having a circuit closer, a gravity switch, and a shunt around the
10 coils of said relay, all of said parts being mounted together and incorporated in a single instrument and connected to the subscriber's outfit so that the relay shall be in a normally open shunt around the talking instruments, and means for closing said shunt,
15 substantially as and for the purpose specified.

6. In a central energy party line telephone system, an electro-magnet at each subscriber's station means for bridging the same
20 across the line, a shunt around said electro-magnet including the subscriber's talking instruments, a circuit closer in said shunt adapted to be operated by said relay, a shunt
25 around the said talking instruments having a permanent resistance, and a gravity circuit breaker in circuit with said relay and circuit closer, substantially as and for the purpose specified.

7. A lockout instrument for party line 30 telephones consisting essentially of an electro-magnet, a circuit breaker operated thereby, and a gravity switch in circuit with said electro-magnet and mounted on the same frame therewith, substantially as and for the 35 purpose specified.

8. In a lockout instrument for party line telephones the combination with an electro-magnet, a circuit breaker operated thereby, and a gravity circuit breaker in circuit in 40 said electro-magnet and mounted on the same frame therewith, and a manually operated circuit breaker in circuit with the said circuit closer, substantially as and for the purpose specified. 45

9. In a central energy party-line telephone system, a relay, a circuit breaker operated thereby, a shunt around the relay including a transmitter, and a shunt around the transmitter having permanent resistance therein, 50 substantially as and for the purpose specified.

In testimony whereof, I have hereunto set my hand this 10th day of February A. D. 1906.

WILLIAM M. BRUCE, JR.

Witnesses:

CHAS. I. WELCH,
CLARA GALLAGHER.