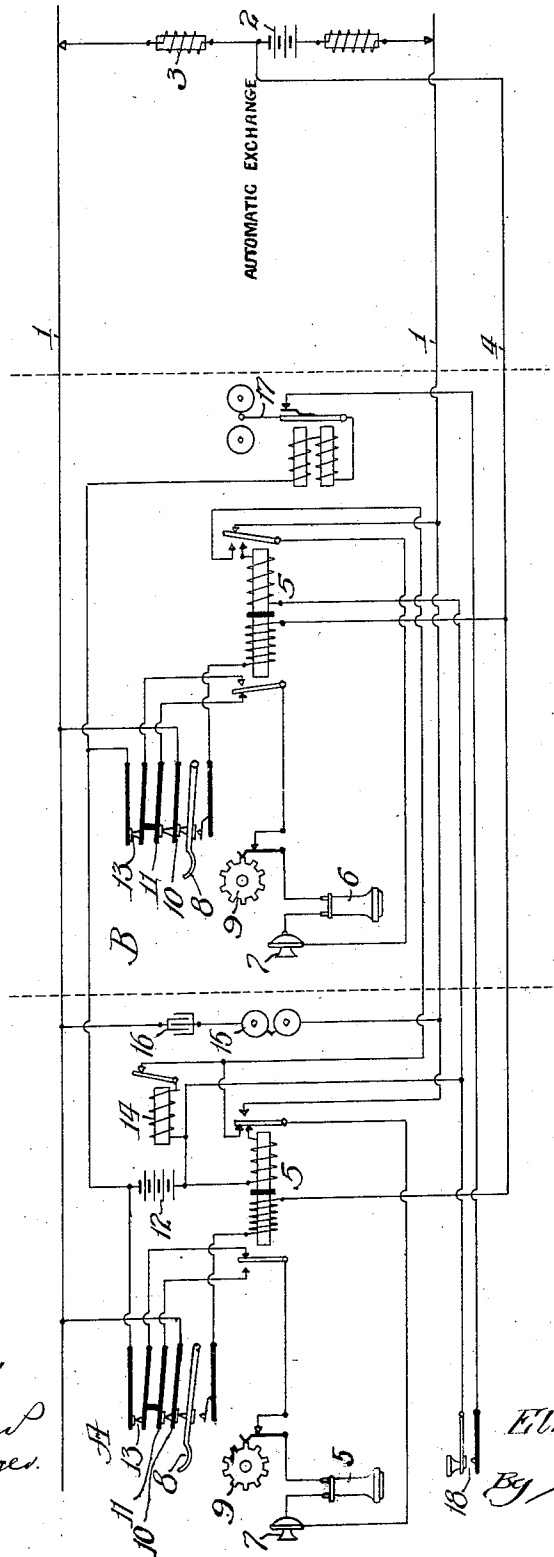


E. R. CORWIN.
TELEPHONY.

APPLICATION FILED APR. 24, 1911.

1,054,176.

Patented Feb. 25, 1913.



Witnesses:

Ed. Davidson
Myron Goebber

Inventor:

Elmer R. Corwin

By *G. L. Graft*
Solty

UNITED STATES PATENT OFFICE.

ELMER R. CORWIN, OF CHICAGO, ILLINOIS, ASSIGNOR TO CORWIN TELEPHONE MANUFACTURING COMPANY, A CORPORATION OF ILLINOIS.

TELEPHONY.

1,054,176.

Specification of Letters Patent.

Patented Feb. 25, 1913.

Application filed April 24, 1911. Serial No. 622,941.

To all whom it may concern:

Be it known that I, ELMER R. CORWIN, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Telephony, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to telephone exchange systems and has for one of its objects the provision of improved means whereby one telephone line may be employed to connect any one of a plurality of stations common thereto with another telephone line in such a manner as to prevent the connection of telephonic apparatus at another of said stations with the telephone line when previously taken for use. This feature of my invention may be practised in connection with a telephone line that extends to an exchange though I do not wish to be limited to this embodiment of the invention.

My invention in another of its aspects relates to that class of telephone exchange systems in which selecting mechanism is employed at the exchange for effecting an extension of the telephone line and this feature of my invention may be embodied in an automatic telephone exchange system though it is not to be limited to systems in which the called parties are automatically connected with calling parties as it is of service where link circuits at the exchange are automatically selected to constitute telephone line continuations.

By means of the present feature of my invention a plurality of stations may be associated with the same telephone line associated with selecting mechanism at an exchange and such telephone line may be limited to operative association with the selecting mechanism governing means at any station first appropriating the line so that any other station or stations appropriating the line cannot interfere with the operation of the selecting mechanism.

I will explain my invention more fully by reference to the accompanying drawing showing one embodiment thereof, in which a telephone line extends from an automatic exchange to a plurality of substations that are here indicated as being in permanent as-

sociation with the line so as to constitute said line a party telephone line or in other words so as to constitute a portion of said line extending from the station nearest the exchange to the other station an extension line, though it is to be understood that I do not limit myself to such a party or extension line equipment.

I do not deem it necessary to describe the automatic telephone exchange system to which the line 1—1 extends as such automatic systems are well known to those skilled in the art. It is known that a bridge connection normally exists between the sides of the telephone line 1—1 or the extensions of said sides and which bridge connection includes the battery 2 and an impedance 3, this bridge connection and the battery therein included taking part in the operation of the equipment of my invention. A third conductor 4 extends from a midpoint of this bridge to the substations A B that are connected with the automatic exchange by the talking sides 1—1 of the telephone line. An electro-magnet or relay 5 is provided at each of the substations, the left hand armature switch of each relay taking part in establishing the connection of the telephone receiver 6 and transmitter 7 with the telephone line when such relay is inert, each telephone receiver and transmitter being included in a complete bridge between the sides of the telephone line when the receiver is removed from its switch-hook 8.

Assuming that the station B desires automatically to effect an extension of the telephone line 1, as for example, by automatically bringing a line to be called in connection with the line 1—1 through the intermediation of automatic telephone exchange equipment, the party at station B will remove his receiver from its switch-hook and thereby establish a bridge across the line which not only includes the receiver and transmitter but also includes a circuit interrupting means 9, such as the well known dial, whereby the party at station B is enabled to effect the desired extension of the line 1. The moment the party at station B has removed his receiver from its switch-hook the line 1 is guarded from circuit association with the circuit interrupting means 9 at any other station since the party at such other station, in endeavoring to appropriate the line 1, will complete the estab-

lishment of an initial energizing circuit through his relay 5 by reason of the momentary simultaneous engagement of the switch-hook 8 with its lower contact which is a follow-up contact and the contact next above the switch-hook, the balance of this circuit through the left hand winding of the relay 5 at station A being completed owing to the inert condition of the relay 5 at the station B. The circuit established by the rising switch-hook 8 at station A and the inert relay 5 at station B is traceable from the upper pole of the battery 2 through the left hand winding of the relay 5 at station A, the switch-hook 8 and the two contacts between which it is disposed, the upper side of the line 1, the contacts 10 and 11 at station B, the left hand armature switch of the relay 5 and its normal contact, the circuit interrupter 9 at station B, the telephone receiver and transmitter at station B, the right hand armature switch at station B to the lower pole of the battery 2. A local holding circuit is immediately established through the relay 5 at station A which may be traced from the upper pole of the battery 12, the two uppermost switch-hook contacts 13, the left hand armature switch of relay 5 at station A and the alternate contact of such switch, the elements 6, 7 and 9 at station A, the right hand armature switch of relay 5 at station A, the lower of the two alternate contacts of such armature switch to the battery 12. The right hand armature switch being thus removed from its normal contact opens the circuit through the telephone receiver and transmitter at station A so that the party at such station cannot listen in. The separation of the right hand armature switch at station A from its normal contact also breaks the bridge conductor that includes the circuit interrupter 9 at station A so that such circuit interrupter cannot interfere with the operation of the circuit interrupter at station B. The equipment at station A may be restored to normal when the party thereat restores his receiver upon its switch-hook owing to the fact that the only circuit remaining intact for the relay 5 at station A is thereupon broken at the contacts 13. When the party at station A thus seeks connection with the appropriated line 1 a test manifestation is produced in his telephone receiver due to the establishment of a test circuit that may be traced from the upper terminal of the battery 12 through the contacts 13 at station A, the left hand armature switch of relay 5 and its alternate contact at station A, the elements 6, 7 and 9 at station A, the right hand armature switch of relay 5 at station A and the upper alternate contact of such armature switch and the interrupter 14 that produces the characteristic testing current.

The equipment thus far described is brought into operation as described when either of the stations seeks connection with the line 1 after it has been appropriated and I will not therefore specifically describe the similar results that occur when the party at station A appropriates the line 1 and the party at station B seeks the use of such line after its appropriation.

As the system is illustrated the station A constitutes the main substation of the line, a bell 15 being located in bridge of the line and in series with a condenser 16 whereby such station A may be signaled from the exchange or by an automatic subscriber in the event of the system being a pure automatic telephone exchange system. If the party wanted should be at station B instead of at station A then the party at station A may close circuit through the signal 17 at station B by the manipulation of the button 18.

While I have herein shown and particularly described the preferred embodiment of my invention, I do not wish to be limited to the precise construction shown as changes may be made without departing from the spirit of my invention, but

Having thus described my invention I claim as new and desire to secure by Letters Patent the following:

1. A telephone system having telephone stations on the same telephone line; electro-magnetic mechanism at one station serving when inert to take part in connecting the telephone at the same station therewith with the line; switching mechanisms at the stations for appropriating the line and jointly cooperating in establishing the energizing circuit for said electro-magnetic mechanism when both are operated in the effort to appropriate the line; and a locking circuit for said electro-magnetic mechanism established by said electro-magnetic mechanism when energized, said locking circuit being under the control of the switching mechanism at the same station therewith so as to be opened when said switching mechanism is restored to normal.

2. A telephone system having telephone stations on the same telephone line; electro-magnetic mechanism at one station serving when inert to take part in connecting the telephone at the same station therewith with the line; switching mechanisms at the stations for appropriating the line and jointly cooperating in establishing the energizing circuit for said electro-magnetic mechanism when both are operated in the effort to appropriate the line; and a locking circuit for said electro-magnetic mechanism established by said electro-magnetic mechanism when energized, said locking circuit being under the control of the switching mechanism at the same station therewith so as to be opened

when said switching mechanism is restored to normal, the electro-magnetic mechanism having one coil in its energizing circuit and another coil in its locking circuit.

3. A telephone system having telephone stations on the same telephone line and which line extends to an exchange; automatically operated selecting mechanism at the exchange for effecting an extension of said telephone line; electro-magnetic mechanism at one station serving when inert to take part in connecting the telephone at the same station therewith with the line; switching mechanisms at the stations for appropriating the line and jointly cooperating in establishing the energizing circuit for said electro-magnetic mechanism when both are operated in the effort to appropriate the line; a locking circuit for said electro-magnetic mechanism established by said electro-magnetic mechanism when energized, said locking circuit being under the control of the switching mechanism at the same station therewith so as to be opened when said switching mechanism is restored to normal; and line circuit interrupting mechanism in circuit with the telephone line independently of the locking circuit whereby the line circuit may be interrupted without disturbing the locking condition of the electro-magnetic mechanism.

4. A telephone system having telephone stations on the same telephone line and which line extends to an exchange automatically operated selecting mechanism at the exchange for effecting an extension of said telephone line; electro-magnetic mechanism at one station serving when inert to take part in connecting the telephone at the same station therewith with the line; switching mechanisms at the stations for appropriating the line and jointly cooperating in establishing the energizing circuit for said electro-magnetic mechanism when both are operated in the effort to appropriate the line; a locking circuit for said electro-magnetic mechanism established by said electro-magnetic mechanism when energized, said locking circuit being under the control of the switching mechanism at the same station therewith so as to be opened when said switching mechanism is restored to normal, the electro-magnetic mechanism having one coil in its energizing circuit and another coil in its locking circuit; and line circuit interrupting mechanism in circuit with the telephone line independently of the locking circuit whereby the line circuit may be interrupted without disturbing the locking condition of the electro-magnetic mechanism.

5. A telephone system having telephone stations on the same telephone line; electro-magnetic mechanism at one station serving when inert to take part in connecting the telephone at the same station therewith with

the line; switching mechanisms at the stations each including a telephone receiver supporting switch hook for operating it and provided at each station for appropriating the line, said switches jointly cooperating in establishing the energizing circuit for said electro-magnetic mechanism when both are operated in the effort to appropriate the line; and a locking circuit for said electro-magnetic mechanism established by said electro-magnetic mechanism when energized, said locking circuit being under the control of the switching mechanism at the same station therewith so as to be opened when said switching mechanism is restored to normal.

6. A telephone system having telephone stations on the same telephone line; electro-magnetic mechanism at one station serving when inert to take part in connecting the telephone at the same station therewith with the line; switching mechanisms at the stations each including a telephone receiver supporting switch hook for operating it and provided at each station for appropriating the line, said switches jointly cooperating in establishing the energizing circuit for said electro-magnetic mechanism when both are operated in the effort to appropriate the line; and a locking circuit for said electro-magnetic mechanism established by said electro-magnetic mechanism when energized, said locking circuit being under the control of the switching mechanism at the same station therewith so as to be opened when said switching mechanism is restored to normal, the electro-magnetic mechanism having one coil in its energized circuit and another coil in its locking circuit.

7. A telephone system having telephone stations on the same telephone line and which line extends to an exchange; automatically operated selecting mechanism at the exchange for effecting an extension of said telephone line; electro-magnetic mechanism at one station serving when inert to take part in connecting the telephone at the same station therewith with the line; switching mechanisms at the stations each including a telephone receiver supporting switch hook for operating it and provided at each station for appropriating the line, said switches jointly cooperating in establishing the energizing circuit for said electro-magnetic mechanism when both are operated in the effort to appropriate the line; a locking circuit for said electro-magnetic mechanism established by said electro-magnetic mechanism when energized, said locking circuit being under the control of the switching mechanism at the same station therewith so as to be opened when said switching mechanism is restored to normal; and line circuit interrupting mechanism in circuit with the telephone line independently of the locking circuit whereby the line circuit may be inter-

rupted without disturbing the locking condition of the electro-magnetic mechanism.

8. A telephone system having telephone stations on the same telephone line and
5 which line extends to an exchange; automatically operated selecting mechanism at the exchange for effecting an extension of said telephone line; electro-magnetic mechanism at one station serving when inert to
10 take part in connecting the telephone at the same station therewith with the line; switching mechanisms at the stations each including a telephone receiver supporting switch hook for operating it and provided at each
15 station for appropriating the line, said switches jointly cooperating in establishing the energizing circuit for said electro-magnetic mechanism when both are operated in the effort to appropriate the line; a locking
20 circuit for said electro-magnetic mechanism established by said electro-magnetic mecha-

nism when energized, said locking circuit being under the control of the switching mechanism at the same station therewith so as to be opened when said switching mechanism is restored to normal, the electro-magnetic mechanism having one coil in its energizing circuit and another coil in its locking circuit; and line circuit interrupting mechanism in circuit with the telephone line independently of the locking circuit whereby the line circuit may be interrupted without disturbing the locking condition of the electro-magnetic mechanism.

In witness whereof, I hereunto subscribe my name this twenty third day of March A. D., 1911.

ELMER R. CORWIN.

Witnesses:

G. L. CRAGG,

ETTA L. WHITE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."