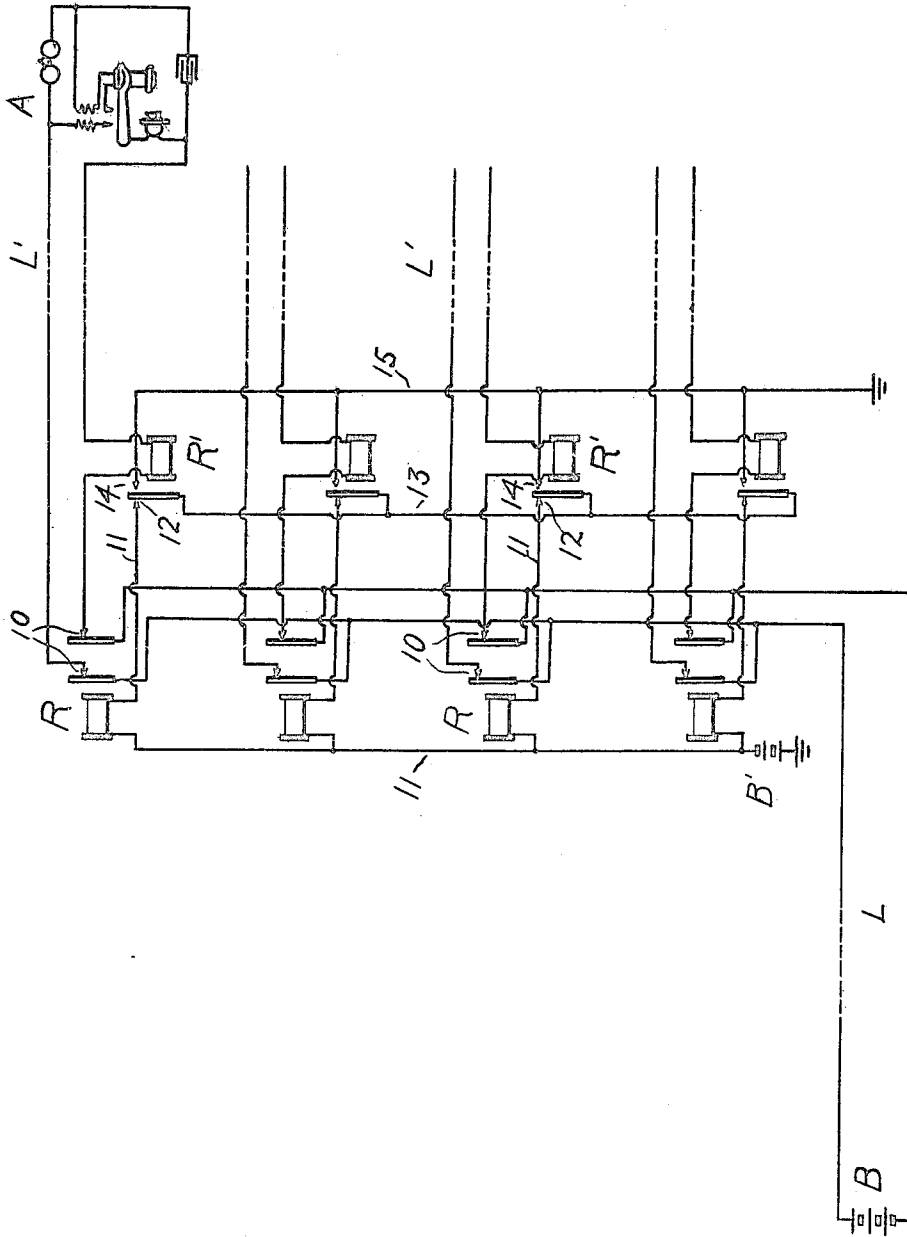


L. D. BARROWS & H. P. CHARLESWORTH.  
 SYSTEM FOR CONNECTING TELEPHONE STATIONS.  
 APPLICATION FILED DEC. 20, 1915.

1,227,735.

Patented May 29, 1917.



Inventors:  
 Leon D. Barrows.  
 Harry P. Charlesworth.  
 by Thomas D. Lockwood Att'y.

# UNITED STATES PATENT OFFICE.

LEON D. BARROWS, OF NEW YORK, N. Y., AND HARRY P. CHARLESWORTH, OF EAST ORANGE, NEW JERSEY, ASSIGNORS TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

## SYSTEM FOR CONNECTING TELEPHONE-STATIONS.

1,227,735.

Specification of Letters Patent.

Patented May 29, 1917.

Application filed December 20, 1915. Serial No. 67,863.

*To all whom it may concern:*

Be it known that we, LEON D. BARROWS and HARRY P. CHARLESWORTH, residing at New York and East Orange, in the counties of New York and Essex and States of New York and New Jersey, respectively, have invented certain Improvements in Systems for Connecting Telephone-Stations, of which the following is a specification.

Our invention relates to means for connecting any one of a plurality of telephone substations to a common line to the exclusion of other stations. An instance of this occurs in systems in which a particular substation of a group is given sole use of a trunk line leading to a central station during connection therewith. By the present invention this individual connection is brought about when the subscriber at any substation removes the receiver from its hook, the normal condition being automatically restored upon the hanging up of the receiver.

The accompanying drawing is a diagrammatic representation of the more essential parts of a system arranged in accordance with one embodiment of our invention.

To a trunk line L, leading from a central or other distant station and connected to battery B thereat, are joined by leads L' a plurality of substations, of which the apparatus of but one is illustrated at A. The leads L' of each substation are connected to the trunk through the contacts of a connection varying relay R. In the present instance, the leads are normally thus connected at the back contacts 10 of said relays. The windings of the relays R are united in parallel by conductors 11 from battery B' local to the substation group to the back contacts 12 of relays R', of which there is one for each substation, with their windings in series with the leads L' of the respective substations. The armatures of the relays R' are joined by a conductor 13, and their coöperating front contacts 14 are connected by a conductor 15 to battery B', the circuit being illustrated as by way of ground.

Assuming the subscriber at A to have taken the receiver from its hook for the purpose of conversing over the trunk, current from the central station battery B flows over the trunk, passing through back con-

tacts 10 of relay R belonging to substation A, leads L' of said station and the winding of the included relay R' and through the contacts of the hook switch at A. Relay R' is thereby energized and its armature is transferred from contact 12 to front contact 14. In leaving contact 12 the armature severs the circuit of relay R of substation A so that it cannot be energized to disturb the normal connection of the leads of this station and the trunk. When contact 14 is made, there is a circuit from battery B' through conductor 15, contact 14 of relay R' individual to substation A, conductor 13, back contacts of all the remaining relays R' and in parallel through conductors 11 and the windings of relays R of the other substations. The relays R, breaking their contacts 10, disconnect the leads of all the substations other than A from the trunk leaving the subscriber at A in control thereof. This opening of the contacts 10, which renders it impossible for other subscribers to listen to the conversation going on or to talk over the trunk, also removes their trunk relays R' from the influence of the hook switches so that the connection at the substation A cannot be affected by them.

When the subscriber at A restores the receiver to its hook, the circuit of his relay R' is opened. Releasing its armature this relay opens the circuits of the relays R of the associated substations, so that they are deenergized and at contacts 10 reconnect their leads to the trunk. At contact 12 relay R of substation A is again made subject to control by the other substations. Now any one of these substations may appropriate the trunk to its exclusive use.

We claim as our invention:

1. A plurality of associated telephone stations, a line for connecting said stations to another station, an electro-mechanism belonging to each of the associated stations and being adapted to vary the connection of such stations to the line, and another electro-mechanism for each associated station in the path of the talking currents controlling the operation of all the connection varying electro-mechanisms.

2. A plurality of associated telephone stations, a line for connecting said stations to another station, a connection varying electro-mechanism for each station, an elec-

tro-mechanism in the path of the talking currents and belonging to each of the associated stations and oppositely controlling the operation of its own connection varying electro-mechanism and those of the associated stations, and a pair of talking conductors furnishing the sole connection between each of the associated stations and its electro-mechanisms.

3. In a telephone system, a plurality of substations, a trunk line for connecting the substations to another station, and a circuit independent of said trunk line, an electro-mechanism for each substation operable over said circuit to disconnect said substation from the trunk, and another electro-mechanism for each substation operable by current over the line to energize the disconnecting electro-mechanisms of the associated substations and to render its companion disconnecting electro-mechanism ineffective.

4. A plurality of associated telephone stations, a line for connecting said stations to another station, a connection varying electro-mechanism for each station, an electro-mechanism belonging to each of the associated stations energized over the line, and a circuit controlled by the last named electro-mechanism for all the connection varying electro-mechanisms of the associated stations, said last-named mechanism being energized over said circuit independently of said line.

5. A plurality of associated telephone stations, a line for connecting said stations to another station, an electro-mechanism belonging to each of the associated stations and being adapted to wholly vary the connection of such stations to the line, another electro-mechanism for each of the associated stations, a circuit for each of the last named electro-mechanisms including the line and contacts at the substation with which the electro-mechanism is associated, and a circuit independent of said line and controlled by said last named electro-mechanism for certain of the connection varying electro-mechanisms.

6. A plurality of substations, a distant station, a trunk line connecting the stations, a relay provided with an energizing circuit independent of said line for connecting and

disconnecting each substation to and from the line, and a relay in the path of the talking currents and governed by the substation equipment for energizing a portion of the connection controlling relays and preventing the energization of another portion of said relays.

7. A plurality of substations, a distant station, a trunk line connecting the stations, a relay for connecting and disconnecting each substation to and from the line, a relay in the path of the talking currents governed by the substation equipment, an energizing circuit for the connection controlling relay and independent of said line including contacts of the substation governed relay and a pair of talking conductors furnishing the sole connection between each of the associated stations and its relays.

8. A plurality of substations, a distant station, a trunk line connecting the stations, a relay for connecting and disconnecting each substation to and from the line, a plurality of trunk relays in the path of the talking currents, a circuit for the connection controlling relays passing through the front contact of one trunk relay and the back contacts of the remaining trunk relays, and a pair of talking conductors furnishing the sole connection between each of the associated stations and its relays.

9. A plurality of substations, a distant station, a trunk line connecting the stations, a relay for each substation acting when energized to disconnect it from the trunk, a relay for each substation having its winding connected to the trunk, an energizing circuit independent of said line for the disconnecting relays including the front contact of one trunk relay and the back contacts of the remaining trunk relays in parallel, and a pair of talking conductors furnishing the sole connection between each of the associated stations and its relays.

In testimony whereof, we have signed our names to this specification in the presence of two subscribing witnesses, this fourteenth day of December, 1915.

LEON D. BARROWS.

HARRY P. CHARLESWORTH.

Witnesses:

WILLIAM H. HORNER,  
CHAS. C. FRITZ.