

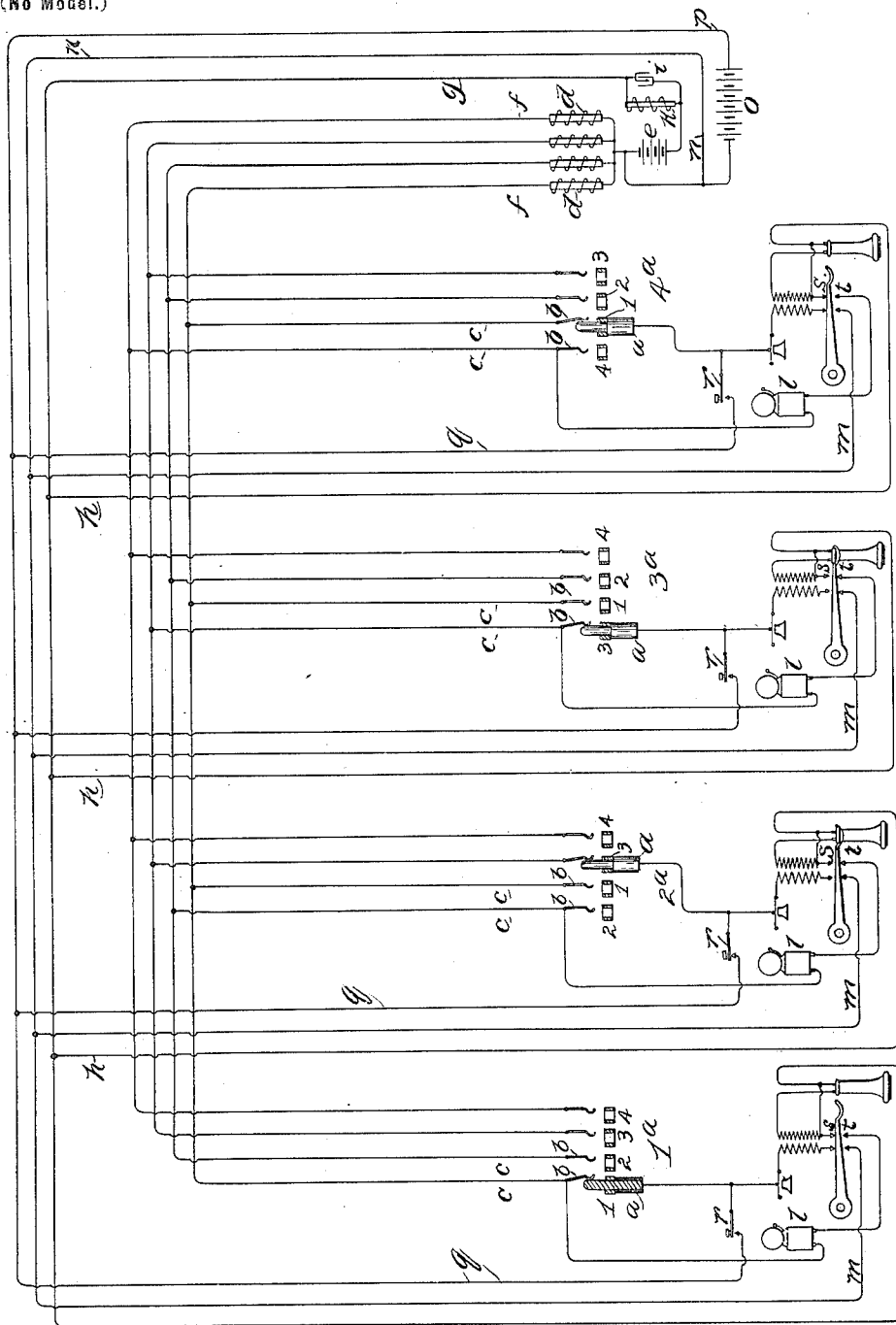
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Patented Oct. 16, 1900.

W. M. DAVIS.
TELEPHONE SYSTEM.

(Application filed June 28, 1900.)

(No Model.)



Witnesses

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WILLIAM M. DAVIS, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE STROMBERG-CARLSON TELEPHONE MANUFACTURING COMPANY, OF SAME PLACE.

TELEPHONE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 659,958, dated October 16, 1900.

Application filed June 28, 1900. Serial No. 21,898. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. DAVIS, a 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 Telephone Systems, (Case No. 4,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to that class of telephone systems in which a number of stations are employed, each subscriber being capable of effecting his own connection with the called subscriber. Such systems are commonly known as "interior" telephone systems.

My invention has for one of its objects the provision of means whereby any subscriber whose line is not in use may be signaled from any other station irrespective of the condition of use of the line-connecting apparatus at the called-subscriber's station.

A further feature of my invention consists in improved means for preventing common batteries employed for supplying the transmitters at subscribers' stations with current from losing their current by leakage. I provide means whereby the transmitters of a plurality of lines may be supplied with current from a common battery without danger of cross-talk.

I will point out my invention in the appended claims and will explain the same more fully by reference to the accompanying drawing, illustrating the preferred embodiment of the invention, four stations equipped with suitable interconnecting apparatus being illustrated in association with suitable current-supply for the signal devices and the transmitters.

The stations 1^a, 2^a, 3^a, and 4^a are provided with interconnecting apparatus preferably in the form of connecting-plugs *a a* and line-contacts preferably in the form of springs *b b*. Thimbles 1, 2, 3, and 4, which serve to guide the plugs into engagement with line-contacts, are provided in front of said contacts, the thimbles in practice being numbered to correspond with the stations. In the drawing I have numbered the thimbles 1, 2, 3, and 4 at each station. For example, if the subscriber

at station 1^a should desire communication with the subscriber at 2^a the plug at station 1^a is inserted within the thimble marked 2, or if connection is desired with station 3^a the plug is inserted within the thimble marked 3. The station 2^a may likewise communicate with station 1^a upon the plug at station 2^a being inserted in the thimble marked 1 or with 3^a upon the insertion of said plug in the thimble marked 3. The line-springs *b b* are connected with lines *c c*, each of which includes the retardation-coil *d* near the talking-battery *e*, these retardation-coils being included between the common battery and the lines of the nearest station, so that the battery may be fed through the retardation-coils, the retardation-coils serving to prevent the voice-currents from being shunted past connected stations. The conductors *f f*, which constitute extensions or continuations of the conductors *c c*, have the terminals next to the battery *e* grouped, the grouped ends having common connection with one terminal of said battery, so that a single battery may pass current to a number of lines. By interposing the retardation-coils between the common ends of the lines united with the common battery voice-currents are prevented from passing from one line to the other through this common connection. The remaining terminal of the battery *e* is connected with the conductor *g*, branches of which conductor include the receivers at the subscribers' stations, each branch terminating in an alternate contact *s*, which is engaged by the switch-hook at the corresponding station when the receiver is removed therefrom. These branches may form electrical continuations of the branches *c* through the agency of inserted plugs, each of which is connected with an alternate contact, adapted also for engagement with a corresponding switch-hook when the receiver is removed, the transmitter and the primary of the induction-coil being included between the said contact and the inserted plug. The secondary of each induction-coil is included in circuit with the corresponding branch *h*. When a branch *h* is thus included in circuit with conductor *c*, current from the common battery is fed through the corresponding transmitter and its coil.

I preferably include a condenser *i* in the

conductor *g* and shunt the same by a retardation-coil *k* of sufficiently-high resistance to prevent the battery *o* from normally operating the signals, while the condenser also serves
5 to prevent the signals from being operated and permits voice-currents to pass through the common conductor *g*.

Signals *l* are preferably audible, bells being illustrated. Each signal has one terminal
10 permanently connected with its line *c*, the remaining terminal of the signal being in the form of a lower contact *t*, adapted for engagement with the switch-hook when the receiver is in place. A second lower contact is provided at each station, constituting a terminal
15 of a branch conductor *m*, extending to each station from a conductor *n*, that is connected with one terminal of a battery *o*, which I preferably employ for operating the signals.
20 A conductor *p* forms a continuation of the conductor *n* and is connected with the other terminal of the battery *o*, branches *q* extending from conductor *p* and each terminating in a contact of a signaling-key *r* at each station.
25 The lever of each signal-key is connected with the plug-strand at the corresponding station. When the receivers are in place upon their hooks and upon the insertion of the plug of the calling subscriber
30 into the jack of the called subscriber, the signal at the called-subscriber's station may be operated upon a depression of the calling-key *r* at the calling-subscriber's station, and this may be done, as will be apparent by an
35 inspection of the drawing, irrespective of the location of the plug at the called-subscriber's station. This is an important improvement, as users are frequently careless in restoring the plugs to their home jacks.

40 By freeing the switch-hooks of permanent connection and by providing the two lower or normal contacts for each switch-hook I am enabled to prevent leakage from the talking-battery without the employment of condensers at each station.

Changes may be readily made from the preferred embodiment of my invention herein shown and particularly described, and I do not therefore wish to be limited to the precise
50 arrangement illustrated; but,

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

1. In an interior telephone system, the combination with a plurality of telephone-lines
55 extending between the stations of the system, of a source of calling-current connected, or adapted for connection, with the said telephone-lines, line-contacts connected with the
60 said telephone-lines, a signal at each station included between its corresponding telephone-line and one terminal of said source of calling-current, one terminal of each signal being permanently connected with its corresponding line-contact, line-connecting switch
65 mechanism at each station to enable each subscriber to connect his station with another,

and a normally-open key or switch *r* included in a conductor uniting the said line-connecting apparatus and the other terminal of said
70 source of signaling-current, substantially as described.

2. In an interior telephone system, the combination with a plurality of telephone-lines
75 extending between stations provided with branches, of signals in said branches, telephone switch-hooks at said stations adapted to be connected with normal contacts constituting terminals of said branches, a transmitter provided at each station, a conductor
80 including the said transmitter, provided with an alternate contact for the said switch-hook, switching means at each station for connecting the transmitter thereat in circuit with a telephone-line, a second alternate contact for
85 the switch-hook, said switch-hook, upon the removal of the receiver, serving to connect the alternate contacts, a common battery included through the agency of the line-connecting apparatus in circuit with the transmitters of the connected stations and the said
90 alternate contacts, signals at the subscribers' stations being disconnected from the telephone-lines when the receivers are removed by the disengagement of the switch-hooks
95 from their normal contacts, whereby leakage of the common battery is prevented, and means for including the said signals in circuit with a source of suitable calling-current, substantially as described.

3. In a telephone system, the combination with a plurality of subscribers' stations, of a common battery serving to supply transmitters at the subscribers' stations with current,
105 signals at each of the subscribers' stations adapted for inclusion in the telephonic circuits and thereby being included in circuit with the said common battery, a winding included in the said telephonic circuit of sufficiently-high resistance to prevent the battery
110 from operating the signals, and a condenser connected in parallel with the said winding, substantially as described.

4. In a telephone system, the combination with a plurality of telephone-lines extending
115 to subscribers' stations, of a common battery, a conductor common to all the telephonic circuits, the battery being included in circuit with the said conductor, signals at each of the telephone-stations adapted for inclusion
120 with the telephonic circuits and thereby being adapted for inclusion in circuit with the common battery, a winding of sufficiently-high resistance to prevent the common battery from operating the signals, and a condenser in shunt of the said winding, substantially as described.

In witness whereof I hereunto subscribe my name this 18th day of June, A. D. 1900.

WILLIAM M. DAVIS.

Witnesses:

GEORGE L. CRAGG,
HARVEY L. HANSON.