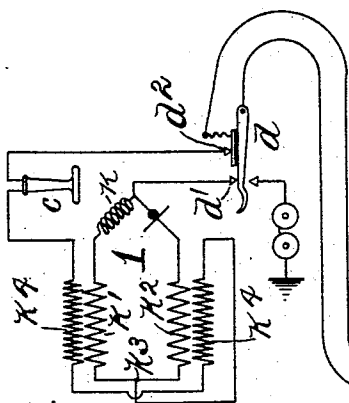
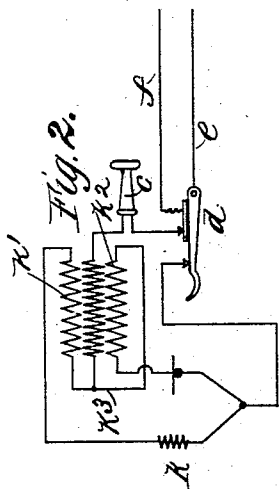
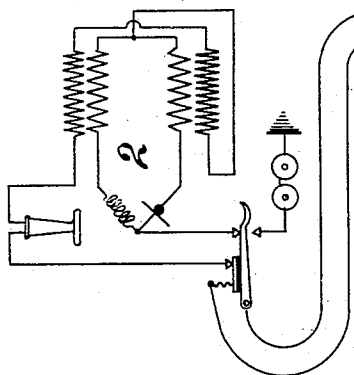


(No Model.)

W. W. DEAN.
COMMON BATTERY TELEPHONE SYSTEM.

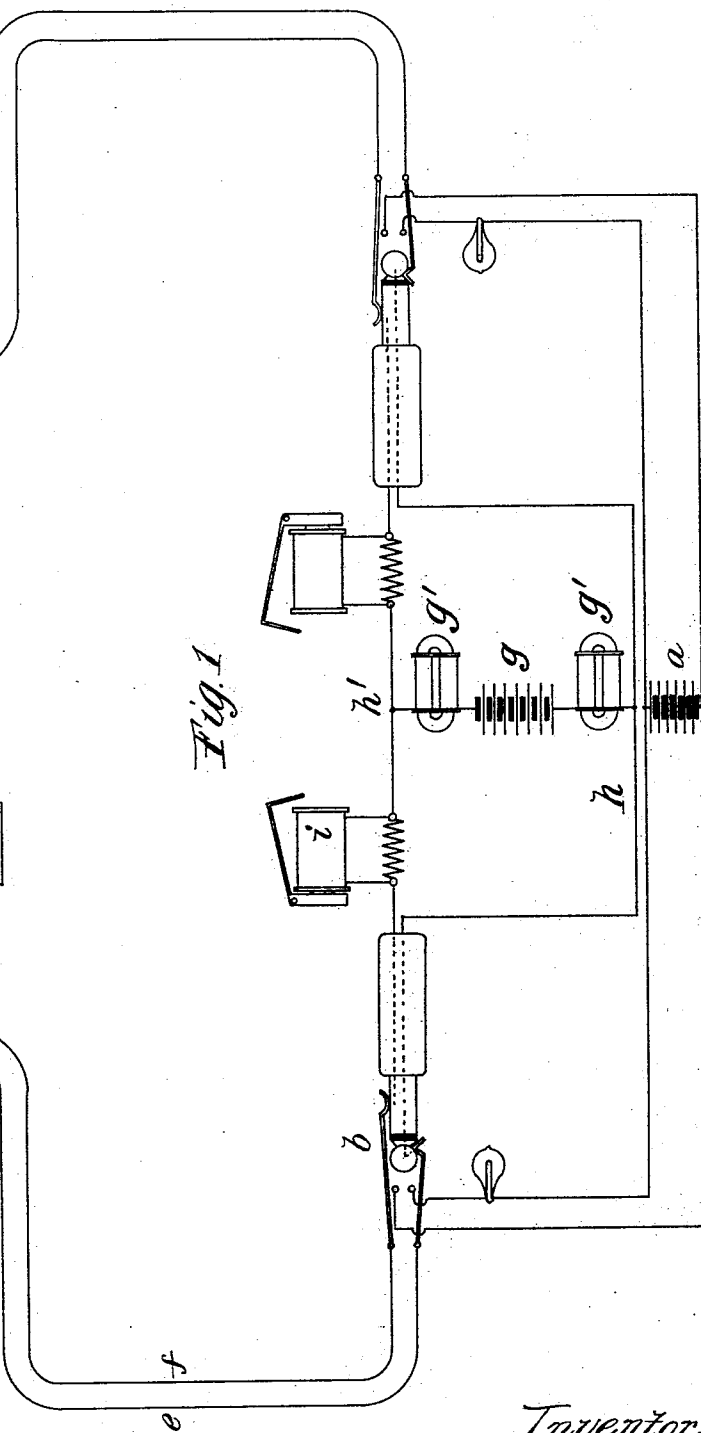
No. 573,576.

Patented Dec. 22, 1896.



Witnesses:
L. M. Canner.
George L. Cragg

Fig. 1



Inventor:
William W. Dean,
By *Barton Brown,*
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM W. DEAN, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE BELL
TELEPHONE COMPANY OF MISSOURI, OF SAME PLACE.

COMMON BATTERY TELEPHONE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 573,576, dated December 22, 1896.

Application filed September 19, 1896. Serial No. 603,346. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. DEAN, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Common Battery Telephone Systems, (Case No. 19,) 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 that class of telephone-exchange systems in which a battery at the central station or any other centralized position may be employed for supplying current to all of the subscribers' transmitters. Some of the advantages of such centralization of the transmitter-battery are set forth in Letters Patent No. 541,077, granted to me June 18, 1895, for telephone system.

My invention relates more particularly to the apparatus and the circuits at the subscribers' stations, a characteristic feature thereof consisting in placing the transmitter or microphone and the primary of the induction-coil in series in the path of the voice-currents with the secondary coil of the said induction-coil.

I preferably employ a transmitter-circuit consisting of two parallel sides, the different sides containing each a primary coil of an induction-coil after the manner set forth in my patent referred to, in which case I connect one limb of the metallic circuit through the local or transmitter circuit and the primaries of the induction-coil in multiple and thence through the secondary coils of the two induction-coils in series, and thence to the other limb or side of the circuit; that is, two induction-coils are thus preferably employed at each subscriber's station, their primaries being in parallel in the transmitter-circuit and their secondary coils being placed in series. By such disposition of the transmitter the primary of the induction-coil and the secondary of the induction-coil in series with the talking-circuit I secure very great efficiency without impairing that uniformity of action which results from supplying the transmitters from a common source.

My invention is illustrated diagrammatically in the accompanying drawings, in which—

Figure 1 shows two subscribers' stations provided with apparatus embodying my invention and united for conversation through a central office. Fig. 2 illustrates a modification of the circuits at the subscriber's station.

Like letters refer to like parts in the several figures.

Referring to Fig. 1, it will be seen that a signaling-battery *a* is normally included in the circuit of each telephone-line, the line having one of its limbs normally grounded at the subscriber's station and the other limb normally open. Thus when the plug is removed from switch *b* the springs of said switch will rest upon the contacts connected with the different terminals of battery *a*, and the telephone *c* of station 1 being hung upon the switch *d* limb *e* of the circuit will be closed to ground at station 1, while limb *f* will be open at said station, and no signal will be indicated by the lamp or other signal device *g*, included at the central office in the circuit thus formed. When subscriber No. 1, for instance, removes his telephone from its hook, current from the battery *g* (which is included with retardation-coils *g'* *g'* in a bridge-strand between the cord-strand *h* *h'*) finds path through strand *h*, limb *e*, to switch-hook *d*, and contact *d'* to the primary transmitter-circuit, the current dividing at this point and passing through the two halves of the primary circuit in parallel, each half of said circuit containing a primary winding. In the half of the primary circuit including primary winding *k*² is the microphone, while a compensating resistance *k* is included in circuit with the remaining winding *k'*. After the current from central battery *g* has thus passed through the halves of the primary circuit in parallel it is passed from point *k*³ through the secondary windings *k*⁴, receiver *c*, contact *d*², limb *f*, clearing-out drop *i*, and strand *h'* back to the source *g*.

Referring to Fig. 2, I have shown two primary coils in association with a single secondary coil of an induction-coil. When one induction-coil only is employed, I preferably dispose the primary coils in two parts, as illus-

trated, the transmitter being included in circuit with one winding k^2 of the primary coil, while the compensating resistance k is included in circuit with the other winding, k' , of the primary coil. The secondary coil of the induction-coil is connected in series with the limb f and the receiver and is connected with the conductor k^3 , uniting the primary windings, as shown, the secondary being thus included in series in the path of the voice-currents with the primary windings. Current is supplied from the central battery g over limb e , thence in multiple through the two windings of the primary coil and the transmitter and compensating resistance included in circuit with the respective windings of the primary circuit. After having thus passed through the primary circuit the circuit is completed by way of the secondary coil and receiver back to the source of current.

I do not desire to be limited to the precise arrangement shown; but,

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

1. The combination of a local transmitter-circuit comprising an induction-coil and a microphone included in circuit with said induction-coil, and a battery adapted to direct current through the primary and secondary helices of said induction-coil in series, said primary and secondary helices being also connected in series in the path of the voice-currents, substantially as described.

2. In a telephone system, the combination of a local transmitter-circuit comprising primary and secondary helices of an induction-coil and a microphone included in circuit with a telephone-line, and a centralized battery adapted to direct current in series over said line through said primary and secondary helices and microphone, said primary and secondary helices being also connected in series in the path of the voice-currents, substantially as described.

3. In a telephone system, the combination of a main telephone-line, with a centralized battery included in circuit therewith, and a local transmitter-circuit comprising primary and secondary helices of an induction-coil and a microphone, all included, or adapted to be included, in series with each other and with said telephone-line and battery, said primary and secondary helices being also con-

nected in series in the path of the voice-currents, substantially as described.

4. The combination with a local transmitter-circuit comprising two parallel branches and two primary windings of an induction-coil included one in each of the branches of said transmitter-circuit, of a secondary winding included in series with said primary windings, a microphone included in said transmitter-circuit, and a battery adapted to direct current in parallel through said primary windings and thence in series through said secondary winding, said primary helices being also included in series with said secondary helix in the path of the voice-currents, substantially as described.

5. In a telephone system, the combination of a local transmitter-circuit comprising two parallel branches, of a primary inductive winding included in each of said parallel branches, a microphone included in said transmitter-circuit, a secondary winding included in series with the telephone-line and said primary windings, and a centralized battery adapted to direct current in parallel through said primary windings and thence in series through said secondary winding, said primary helices being also included in series with said secondary helix in the path of the voice-currents, substantially as described.

6. In a telephone system, the combination with a telephone-line extending in two limbs to the central station, said limbs being united, or adapted to be united, at the substation, a local transmitter-circuit comprising two parallel paths included, or adapted to be included, in circuit with said telephone-line, a primary winding included in each of said parallel paths, a microphone included in said local transmitter-circuit, a secondary winding included in series with said telephone-line and said primary windings, and a centralized battery adapted to transmit current in parallel through said primary windings and thence in series through said secondary winding, said primary helices being also included in series with said secondary helix in the path of the voice-currents, substantially as described.

In witness whereof I hereunto subscribe my name this 16th day of September, A. D. 1896.

WILLIAM W. DEAN.

Witnesses:

GEORGE P. BARTON,
GEORGE L. CRAGG.