

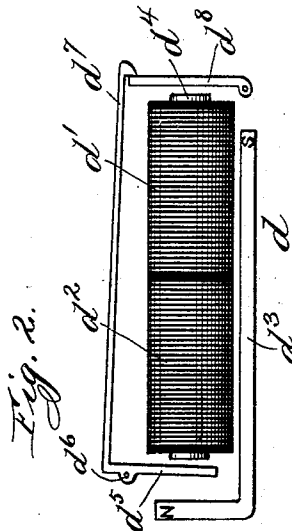
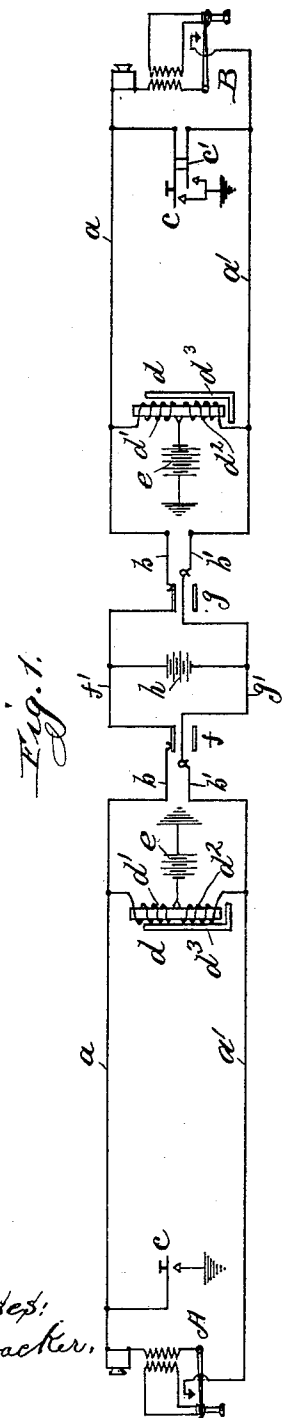
No. 633,547.

Patented Sept. 19, 1899.

W. M. DAVIS.
TELEPHONE SYSTEM.

(Application filed Feb. 6, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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

TELEPHONE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 633,547, dated September 19, 1899.

Application filed February 6, 1899. Serial No. 704,644. (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, 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 a telephone system, my object being to provide an improved form of annunciator and circuit arrangements therefor. In an application, Serial No. 687,676, filed August 4, 1898, I have illustrated a system wherein an individual annunciator is provided at the central station in connection with each line, which annunciator is provided with two coils or windings, one connected between each of the limbs of the metallic circuit and a third conductor, whereby a calling-current may be sent over either or both of the metallic limbs through the annunciator-coils to the third conductor. I have employed this form of annunciator in connection with a central-battery system and have experienced difficulty, due to the fact that when the central battery is connected with the line there is a tendency to throw the annunciator-drop, thereby giving a false signal, unless means are provided for preventing this operation.

In accordance with the present invention I make the two coils of the annunciator as nearly equal as is practicable and wind the same so that to a current passing from one metallic limb through the coils in series to the other metallic limb the coils are opposed, whereby they tend to neutralize each other. In consequence the connecting of the central battery across the limbs of the line results in a current which traverses the two coils in series, whereby the annunciator remains irresponsive. Due to the practical difficulty of getting the two windings precisely equal, so that they will exactly neutralize each other, I provide in connection with the annunciator a permanent magnet, whereby a polarized annunciator results, this polarization compensating for any difference in value between the two coils of the annunciator. The polari-

zation is such that when the current from the central battery traverses the coils in series there is no tendency to throw the drop, while the drop readily responds to a current passing from either metallic limb to the third conductor.

I have illustrated my invention in the accompanying drawings, in which—

Figure 1 is a diagram of the circuit arrangements. Fig. 2 is a view of the polarized annunciator which I employ.

Like letters refer to like parts in both figures.

I have illustrated the two limbs a a' of a telephone-line extending from the substation A to the switch-contacts b b' at the central station. A key c is provided at the substation, whereby the limb a may be connected with a third conductor, which in the present instance is illustrated as ground. At the central station an individual annunciator d is provided having two coils or windings d' d'' , the coil d' being connected between the limb a and the third conductor or ground, while the coil d'' is connected between the limb a' and the third conductor or ground. A battery e is placed in the leg extending to the third conductor or ground. The magnet d^3 serves to polarize the annunciator. When the key c is depressed, the current of battery e is closed through the third conductor to key c , thence over limb a and coil d' back to the battery, thus actuating the drop.

The substation B is provided with similar apparatus indicated by the same reference-letters as those employed in connection with substation A. Instead of the single key c , however, an additional key c' is provided, whereby both of the limbs a a' may be connected to the third conductor, whereby when the keys c c' are depressed current from the battery e passes through both coils of the annunciator. The lines are illustrated as connected through a cord-connector comprising a pair of plugs f g , connected by strands f' g' and with central battery h , connected between the strands.

In Fig. 2 the details of the annunciator are illustrated, the annunciator comprising the two coils d' d'' , mounted upon the core d^4 , the permanent magnet d^3 being placed in position

to polarize the core. The armature d^5 is pivoted at d^6 and is provided with an arm d^7 , which holds the drop d^8 in position, the drop being released when the armature d^5 is attracted.

When the lines are connected together for conversation, the current from battery h passes through the coils d' and d^2 in series and, due to the fact that the coils are wound to oppose each other, the effective magnetism resulting will be that due to the difference which may exist between the two coils, which difference is necessarily very small, if present at all. The polarization of the annunciator is such that this small magnetism is not sufficient to overcome the permanent magnetism, and in consequence the annunciator remains inert during the passage of the battery-current. A current passing from either or both limbs to the third conductor, however, is in such a direction as to cause the annunciator to respond.

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

1. The combination with a telephone-line extending in two limbs to the central station, of an annunciator thereat having two coils, one connected between each limb and a third conductor, said coils being wound to coact when currents are sent over both limbs through the annunciator to the third conductor and to neutralize or oppose each other when current passes from one limb through the two coils in series to the other limb, a bat-

tery or source of current adapted to be connected in circuit to send current from one limb to the other through the two coils in series, and means for permanently polarizing the core of the annunciator whereby the annunciator responds to calling currents sent over one or both limbs to the third conductor while remaining irresponsive to said battery-current, substantially as described.

2. The combination with a telephone-line extending in two limbs to the central station, of an annunciator thereat having two coils one connected between each limb and a third conductor, said coils being wound to coact when current is sent over both limbs through the annunciator to the third conductor and to neutralize or oppose each other when current passes from one limb through the two coils in series to the other limb, a pair of cord-connectors for connecting two lines for conversation, a battery or source of current connected in the cord-circuit and adapted when connection is made with the line to send current from one limb to the other through the two coils in series and means for permanently polarizing the core of the annunciator, substantially as described.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

WILLIAM M. DAVIS.

Witnesses:

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PERCY C. GILL.