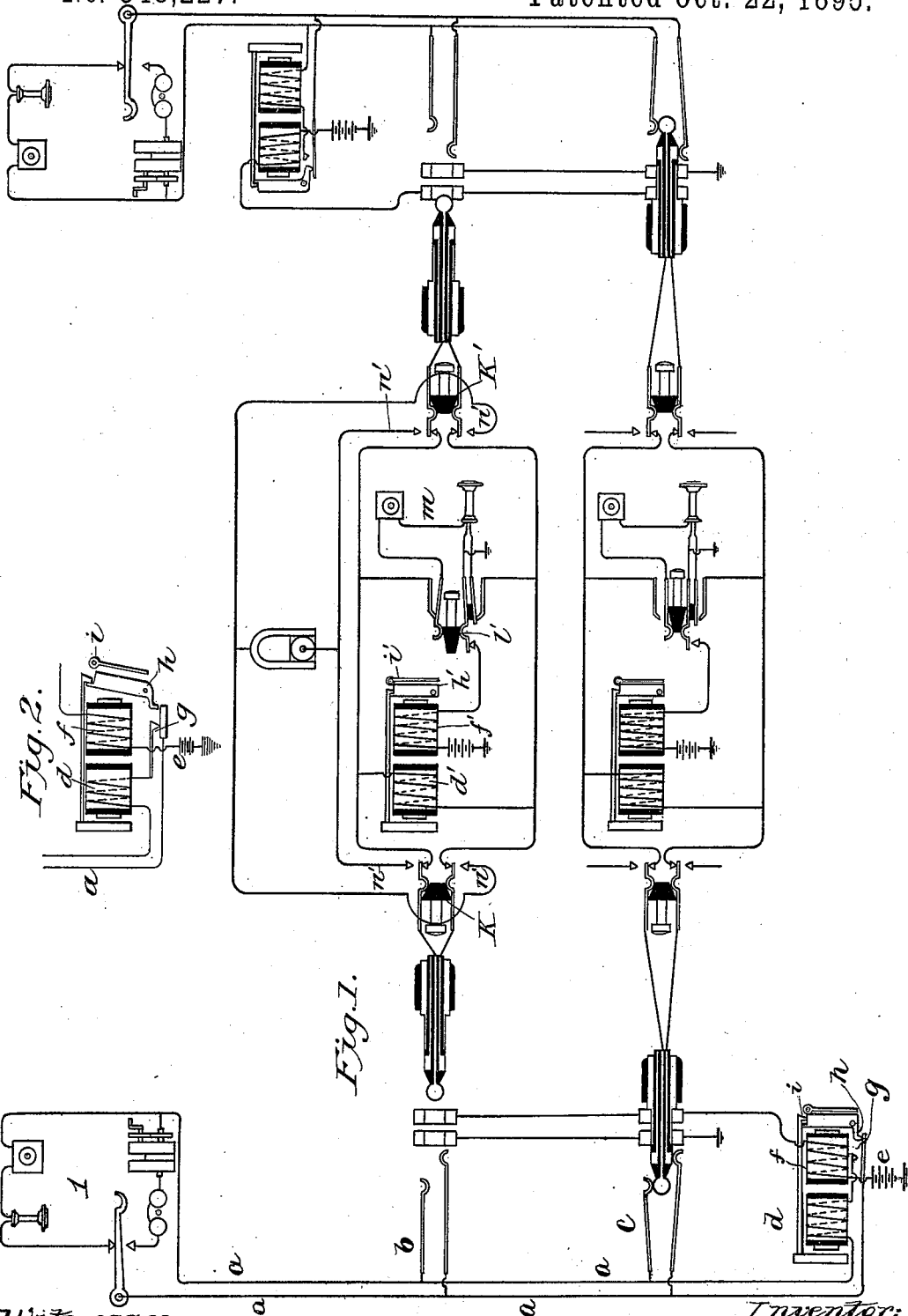


(No Model.)

C. E. SCRIBNER.
TELEPHONE EXCHANGE APPARATUS.

No. 548,227.

Patented Oct. 22, 1895.



Witnesses:
George L. Cragg
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UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN
ELECTRIC COMPANY, OF SAME PLACE.

TELEPHONE-EXCHANGE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 548,227, dated October 22, 1895.

Application filed March 5, 1892. Serial No. 423,917. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Telephone-Exchange Apparatus, (Case No. 292,) 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 multiple switchboards are employed and in which the individual annunciator of each line is provided with two electromagnets and two armatures, one of the armatures acting as the drop, the circuits being so arranged that the drop will be automatically restored and held in position when the operator at the central office inserts a plug in the switch of a line.

Heretofore in such systems the main retaining-magnet of the pair of magnets has been left in a closed bridge between the different sides of the line-circuit at the exchange. When so left in a closed loop in case lines of high resistance are connected together, this closed loop will act as a shunt, so as to materially weaken the voice-currents that are being sent over the line.

The object of my invention is to provide mechanism for opening the normally-closed bridge in which the operating coil of the individual annunciator is included and adapted to be actuated by current in a local circuit arranged to be closed when connection is made to the line. Such mechanism may be an electromagnet included in the said local circuit and provided with an armature actuating contacts included in the branch circuit with the annunciator.

My invention may consist in means connected with the individual annunciator for automatically opening the said loop, so as to avoid weakening of the voice-currents.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 represents, diagrammatically, the entire system embodying my invention; and Fig. 2, the line-annunciator in its normal condition.

In the drawings I have shown two telephone-lines extending each from the subscriber's station thereof to the central office and each connected with a spring-jack switch on each of two switchboards. At each board is provided an operator's outfit in connection with a single pair of plugs and cords. Thus station 1 is connected by line *a* with the switches *b c* and includes the coil of the operating-magnet *d* of the individual annunciator. This coil *d* is in that portion of line *a* included between the two springs or line-terminals of switch *c*. The battery *e* is connected through the coil of the restoring-magnet *f* and thence with the test-pieces of said switches *b c*. The tube of the switches is divided into two parts, and the plug is provided with contact-points, one for each of the springs, and the other contact being in the form of a sleeve serves to connect the two portions of the tube together. One portion of each tube is connected to ground. Thus when a plug is inserted battery *e* is closed through coil of restoring-magnet *f* in a well-known way to bring the armature of said magnet *f* back and hold the same in position as long as connection remains with the line.

I do not deem it necessary to describe in detail the operator's outfit at each of the boards. Suffice it to say that the operator's outfit and the manner of receiving and answering a call and connecting and disconnecting the line is illustrated in a manner well known and understood. In short, any of the well-known forms of operators' outfits adapted to do the work may be employed.

When the individual annunciator-target *i* is raised, the operator places the plug in the subscriber's switch, as at *c*. The operator depressing the listening-key *l'* throws her telephone *m* in circuit with the subscriber. The operator then places the plug in the switch of the required subscriber and depresses the ringing-in key *K'*, throwing the required subscriber's line in circuit with the operator's generator-circuit *n'*. The required subscriber having responded, the operator's generator-circuit is thrown out by the key *K'* being elevated, and the operator's telephone *m* is thrown out by elevating the key *l'*. The subscribers are then in communication and the

clearing-out annunciator-coil is in parallel with the speaking-circuit; but the clearing-out annunciator-coil is unaffected by the weak speaking-current. However, when the subscriber wishes to be disconnected the current of his generator is strong enough to actuate the coil *d'*, and releasing the armature *h'* the target *i'* is raised, indicating to the operator that the subscribers wish to be disconnected. By depressing the key *l'* the circuit is closed through the restoring-coil *f'* and the target *i'* is restored to its normal position.

My invention relates particularly to the means employed in connection with the restoring-electromagnet *f* for automatically opening the loop or shunt which contains the coil of the main operating electromagnet of the individual annunciator. I have found the most simple means of opening such loop to be to provide a key *g*, the spring of which is forced away from the anvil or back-stop thereof by the force of the restoring-magnet *f* when energized. To this end I have provided an arm *h* upon the drop, which arm *h* is forced against the spring of the key *g* to hold said key *g* open as long as the drop remains closely held against the pole of electromagnet *f*. It will be understood that when this drop is simply retained by the hook connected with the armature of lever *d* it will be farther away from the pole of magnet *f*, lightly resting against the apron or target *i*. When in such slightly-removed position, the key *g* will be closed, although the apron or target will not be pressed against sufficiently to cause it to be held up to indicate a call signal.

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

1. The combination, with a telephone line, of an individual annunciator consisting of a main retaining magnet and its armature, and a restoring magnet and the armature thereof acting as a drop, said drop being normally engaged by the armature lever of the retaining magnet, and when so in engagement resting a short distance from the pole of the restoring magnet and a key included in the circuit of the retaining magnet, said drop when attracted to its pole being adapted to open said key, substantially as specified.

2. The combination, with a telephone line extending from a substation to an exchange, of spring jack switches with which the line is connected, an individual annunciator included in a normally closed branch circuit between the different sides of the line, two contact pieces upon each of the spring jacks, like contacts of the different switches belonging to the line, being connected together, an electro magnet and a source of electricity in a normally open local circuit of which the two groups of contact pieces constitute the normally separated terminals, contact points in connection with said electro magnet adapted to open the bridge wire containing the individual annunciator when said magnet is energized, and a connecting plug adapted for insertion in one of the jacks and arranged to cross together the said terminals of the local circuit when so inserted, substantially as described.

In witness whereof I hereunto subscribe my name this 13th day of February, A. D. 1892.

CHARLES E. SCRIBNER.

Witnesses:

M. J. TALLETT,

FRANK R. MCBERTY.