

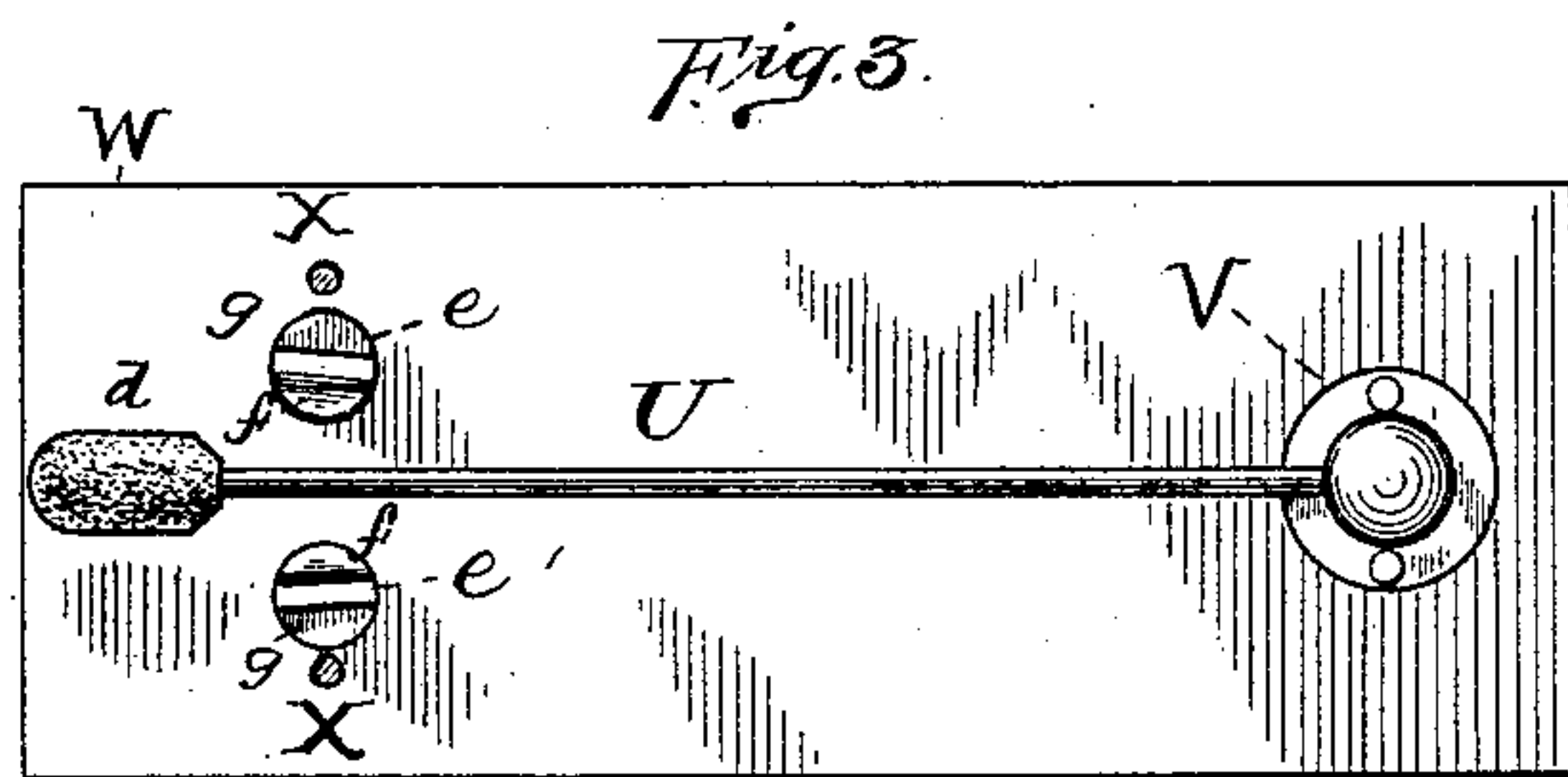
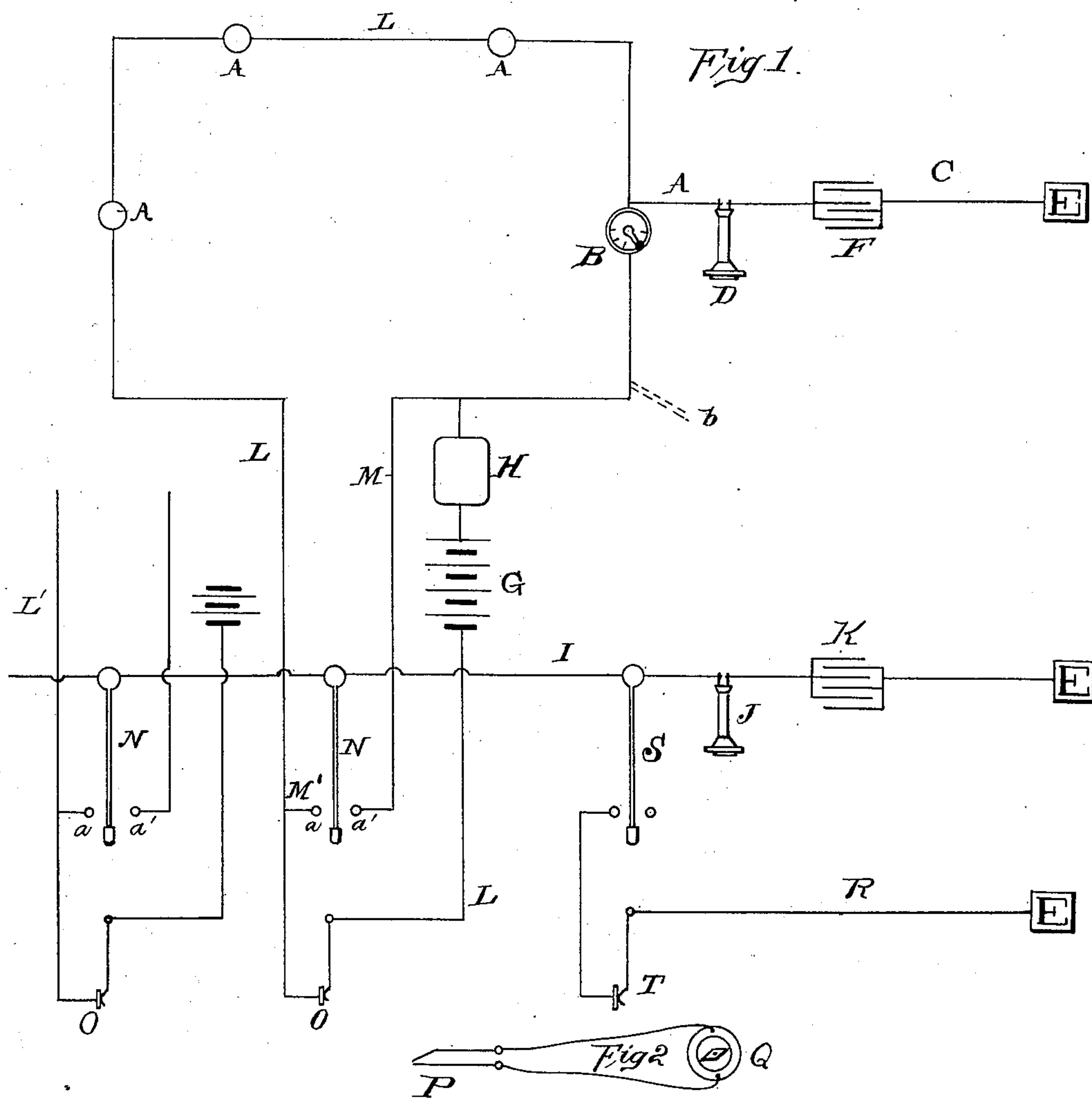
(No Model.)

J. F. MEHREN & W. CARROLL.

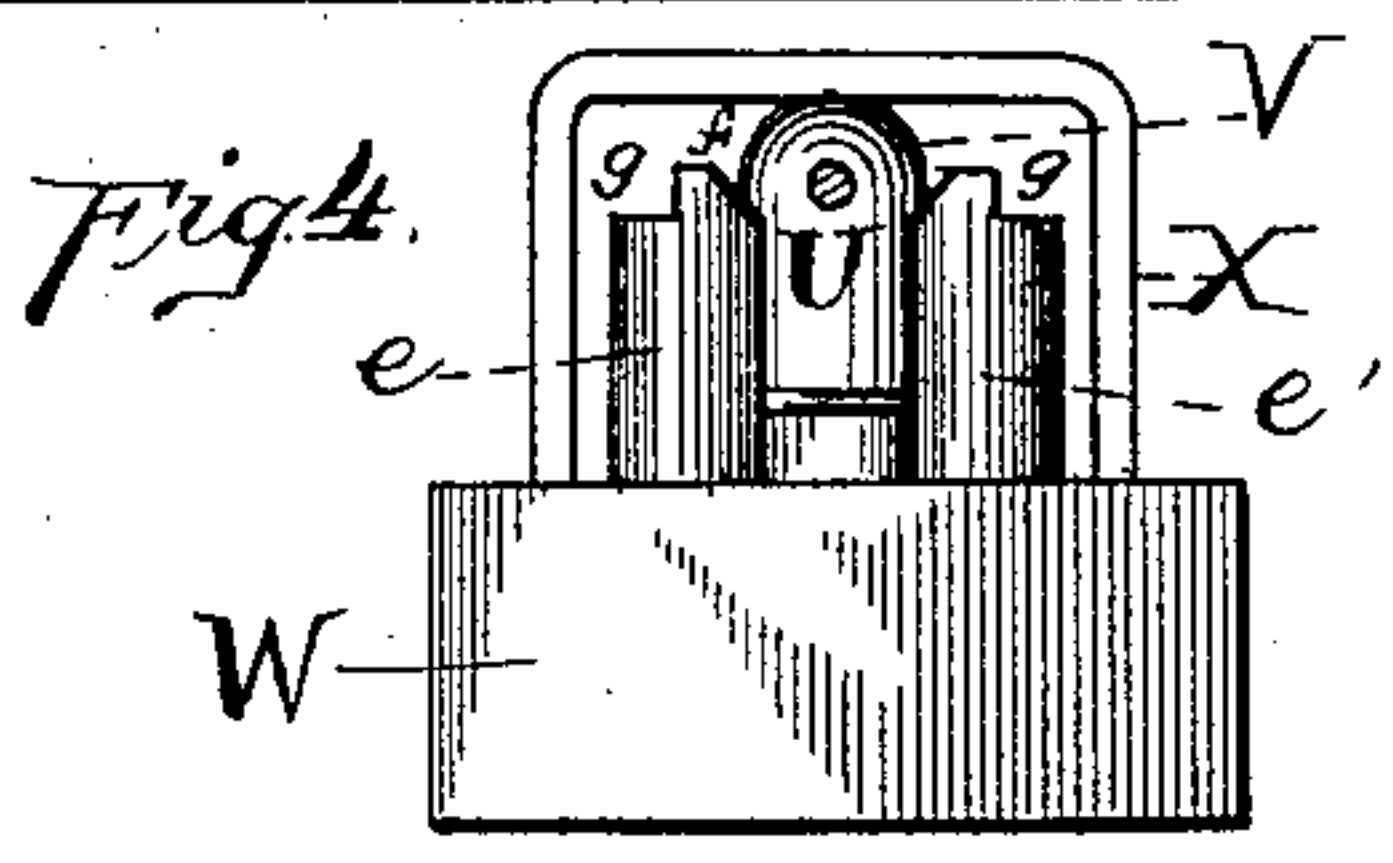
POLICE TELEGRAPH SYSTEM.

No. 359,575.

Patented Mar. 15, 1887.



ATTEST:  
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# UNITED STATES PATENT OFFICE.

JACOB F. MEHREN AND WILLIAM CARROLL, OF CHICAGO, ILLINOIS, AS-  
SIGNORS TO THE POLICE TELEPHONE AND SIGNAL COMPANY, OF  
SAME PLACE.

## POLICE TELEGRAPH SYSTEM.

SPECIFICATION forming part of Letters Patent No. 359,575, dated March 15, 1887.

Application filed August 24, 1886. Serial No. 211,710. (No model.)

*To all whom it may concern:*

Be it known that we, JACOB F. MEHREN and WILLIAM CARROLL, both of Chicago, in the county of Cook and State of Illinois, have jointly invented a certain new and useful Improvement in Police Telegraph Systems, of which the following is a specification.

Our invention relates, mainly, to systems of police telegraphy, in which systems a number of outlying stations are connected with a central office, such stations being each provided with a call-box for signaling the central office, and each station, as well as the central office, being provided with a telephone set for additional communication; and our invention relates, also, to a simple and efficient form of switch adapted to be used in connection with our improvements on the police system, but also adapted for use in other situations in electrical work.

Our object is mainly to so arrange the system that a cross or ground-connection on any line leading to the central office will not seriously impair the transmission of speech over such line, and also to furnish a convenient and simple mode of testing the line for such crosses or ground-connections.

Our invention consists in the novel devices and combinations of devices employed by us in carrying out these objects, some of which devices are, however, as just stated, applicable to other electrical purposes, as hereinafter set forth and claimed.

Our invention is illustrated in the accompanying drawings.

Figure 1 is a diagram of a police telegraph system embodying said invention; Fig. 2, a diagram of the testing-plug and galvanometer; Fig. 3, a top view of the switch which constitutes part of our invention, and Fig. 4 an end view of said switch.

L and L' are lines extending from the same central office, only one of which, L, is shown complete, but on each of which are situated a suitable number of outlying signaling-stations, A. The instruments at the outlying stations are shown at one of said stations only, they being the same at each of the others on both or all the lines. A call-box, B, of the well-known kind, adapted to transmit either

of several arbitrary signals, is placed in the line. A branch, C, extends from the line to ground, and in such branch is located a telephone outfit, (represented by D,) between which and the ground is a condenser, E. The switch, operated automatically by the weight of the telephone-receiver in the usual manner, is one in which the earth-connection is cut off when the telephone is not in use and closed when the receiver is taken from its support for use. The above is the usual and well-known arrangement for these systems.

At the central office for each line extending therefrom there is a main battery, G, and a self-starting register, H, in the line, and in a branch, I, to earth, common to all the lines, there is a telephone outfit, J, with an automatic switch, such as just described, and a condenser, K. This also, generally speaking, is the well-understood arrangement.

Heretofore the branch to ground at the central office has been taken directly from the lines. We, however, provide for each line a branch, M, extending from one side of the line outside the register and battery, which we place in the same side of the line, and a branch, M', extending from the other side, and we connect the earth branch I with the switch-lever N, (one for each line,) whereby such branch may be connected either with M or M', the switch normally standing centrally between the terminals a a' of these branches.

The switch which we prefer to use is of a novel construction, forming part of our invention, and hereinafter specifically described. We may, however, use a switch of any other construction suitable for the purpose.

When a signal is received on the register H from the call-box B calling for telephonic communication with the office, the central operator, by removing his telephone from its support, makes his ground-connection, and at the same time he moves switch N of the line from which the signal comes either to a or a', whereby the branch I is connected with the line. The person at the outlying station having also made his ground-connection by detaching his receiver, the telephone-circuit is complete.

Whether the lever N is moved to one side



or the other is determined by the presence of crosses or ground-connections in the line on one side or the other. Suppose a leak to exist at *b*. Then if the switch is on the point *a'* the telephone cannot be used; but if the switch is placed on point *a* it can be used, because the resistance of the battery *G* and register *H* is thus brought between the leak and the ground-connection on one side, and the telephone-signals therefore will go in the other direction and avoid the leak. If the leak is on the other side, the reverse is the case. The telephones will not operate with the switch on *a*, but will when the switch is on *a'*.

The spring-jack *O* in the line is provided for the purpose of conveniently inserting in the line a galvanometer or other instrument for testing or other purposes.

*P* represents a double spring-jack plug having a galvanometer, *Q*, connected with it. For testing the system a connection, *R*, extends from branch *I* to earth, having in it a switch, *S*, and a spring-jack, *T*. On inserting plug *P* in jack *T* and closing switch *S* a ground-connection is made from all the switch-levers *N*. Then by closing such switch-levers *N* on one side and the other a leak in any line and the side in which it occurs is shown by the extent and direction of deflection of the galvanometer. As another means for testing, plug *P* may be inserted in jack *O*, which places the galvanometer directly in the line.

The preferred form of switch (shown in Figs. 3 and 4) consists of a stiff spring wire or rod, *U*, having one end rigidly inserted in a post, *V*, rising from an insulating base, *W*, to which post *V* a connection may be made, as the connection *I* in Fig. 1. Spring *U* has an insulating knob or handle, *d*, at its free end. Near its free end the spring extends between two contact-posts, *e* and *e'*, each of which is beveled at *f* on its inner side and has a shoulder at *g* on its outer side. To each of these posts a connection may be made, as in the switch *N*, or a connection may be made to only one of them, as in the switch *S*. These connections are preferably made at the under side of the posts under the insulating-base.

*X* is a bent wire guard placed without the posts *e e'*. The spring *U* normally stands in a central position between the posts, but to close circuit it is moved in one direction or the other over the beveled end of the post and upon the shoulder *g*, where its resiliency will hold it firmly and cause it to make a good and firm electrical connection. To break connection the switch is simply raised above the post, and it at once returns to its central position. The bent wire guard *X* prevents the spring from being strained by moving it too far.

The advantages of this form of switch are that it does away with the usual pivoted or swiveled connection, which is liable to have bad contacts and to get out of order; it cannot be accidentally moved from one contact to the other, which is often done with a pivoted switch-

lever when it is moved quickly or carelessly; its movement cannot be stopped by the hand, but it must return to its position as soon as it is raised off the post, and it makes a particularly firm and good connection.

What we claim is—

1. In a system of police telegraphy, the combination of the main or signaling line, the ground branches at the stations, including telephones, a ground branch at the central office, including a telephone, a battery and register in the main line at the central office, and a switch for connecting said central office ground branch to either side of the main line beyond said battery and register, substantially as set forth.

2. In a system of police telegraphy, the combination of the main or signaling line, the battery and register therein at the central office, the ground branches at the stations, including telephones, a ground branch at the central office, including a telephone, an open branch extending from each side of the main line beyond said battery and register, and a switch for connecting said central office ground branch to either of said open branches, substantially as set forth.

3. In a system of police telegraphy, the combination of two or more main or signaling lines extending from a central office, each having at its outlying stations ground branches, including telephones, a ground branch at the central office, including a telephone, and a switch for each line for connecting said ground branch with either side of such line, substantially as set forth.

4. In a system of police telegraphy, the combination of the main or signaling lines, the ground branch at the central station, the switches for connecting said ground branch to either side of either of said lines, a sub-branch from said ground branch to ground, and means for connecting a galvanometer in said sub-branch, substantially as set forth.

5. In an electrical switch, the combination of a spring secured rigidly at one end and contact-posts, said spring standing normally between said posts, and said posts being adapted to hold said spring when it is moved into contact with one or the other of them, substantially as set forth.

6. In an electrical switch, the combination of the spring *U*, held rigidly at one end, and the contact-posts *e e'*, having shoulders *g*, substantially as set forth.

7. In an electrical switch, the combination of the spring *U*, held rigidly at one end, the contact-posts *e e'*, and the guard *X*, substantially as set forth.

This specification signed and witnessed this 20th day of August, 1886.

JACOB F. MEHREN.  
WILLIAM CARROLL.

Witnesses:

C. E. GOOD,  
FREDRICK W. GUND.