

(No Model.)

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SPRING JACK AND CIRCUIT FOR THROUGH TELEPHONE LINES.

No. 283,312.

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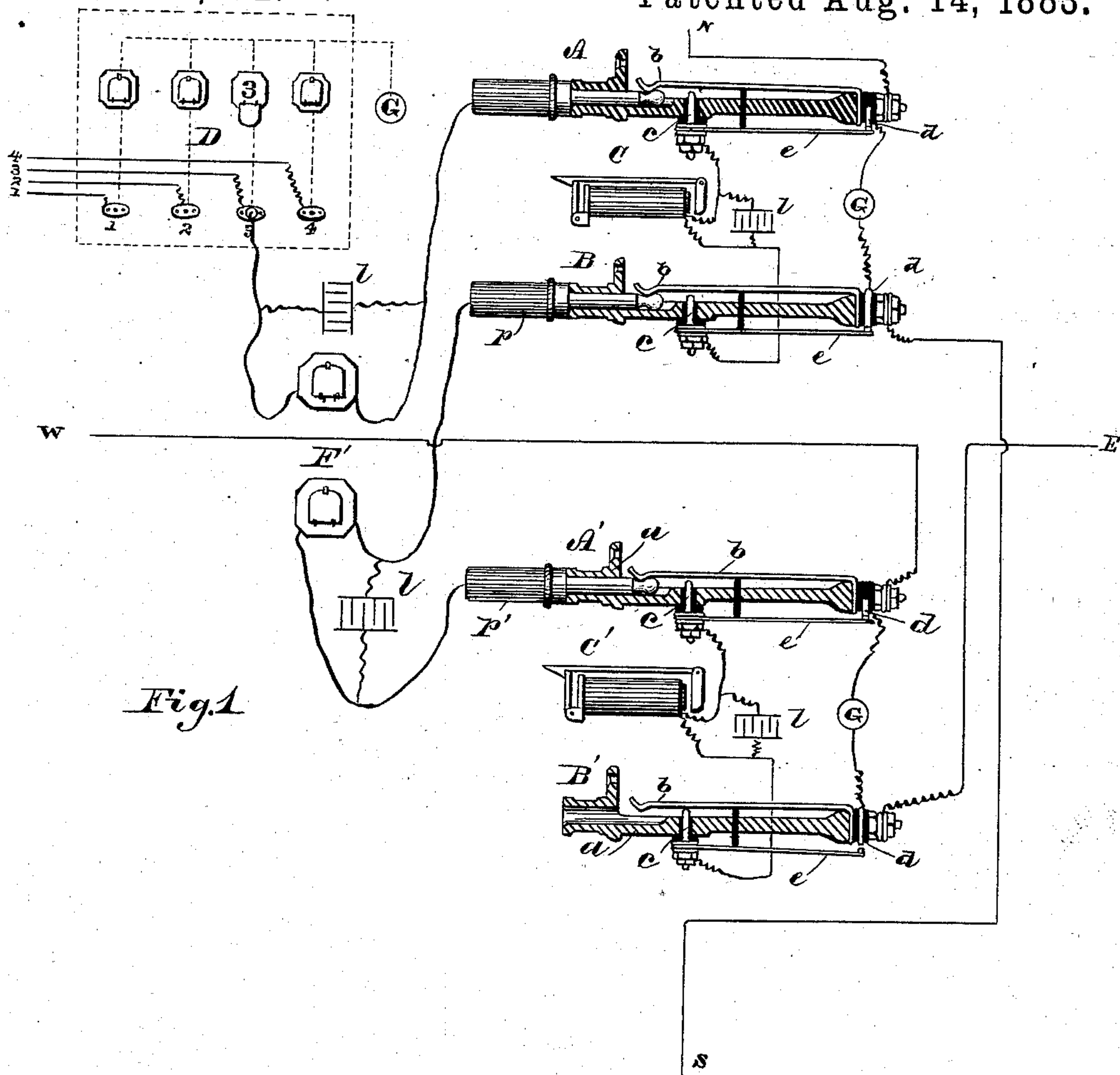


Fig. 1

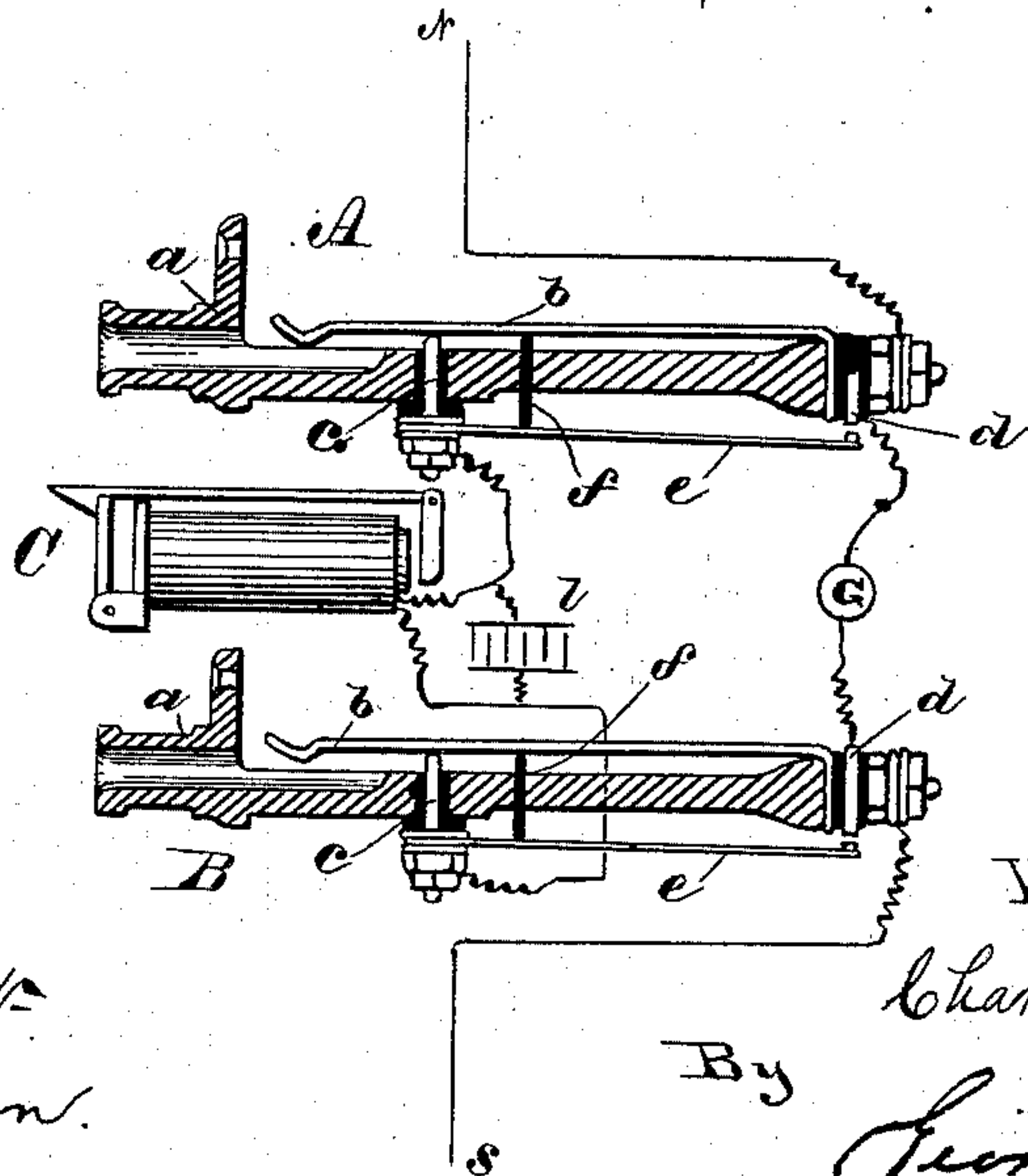


Fig. 2

Attest

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SPRING-JACK AND CIRCUIT FOR THROUGH TELEPHONE-LINES.

SPECIFICATION forming part of Letters Patent No. 283,312, dated August 14, 1883.

Application filed May 7, 1883. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. WILSON, 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 Spring-Jacks and Circuits for Through Telephone-Lines, 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.

It has become common to connect telephone-exchanges of different towns by means of special lines, so that a subscriber of an exchange in one town may converse with any subscriber of the exchange in the other town. In order that these special lines may be utilized to their fullest extent, they are run from one exchange to another, and thence to a third, and so on, so that a special line of a given length connects with as many exchanges as possible. Thus a special line from Chicago to St. Louis would be run by the way of Springfield. A line running through an intermediate town in this manner is termed a "through-line," and the town is termed an "intermediate station."

My invention relates to the switching apparatus and circuits at an intermediate station, but may be used for all analogous purposes to which it is adapted.

My invention consists in certain improvements in spring-jack switches; also, in the circuits and combinations herein described and claimed.

In the accompanying drawings, Figure 1 represents an intermediate station on two through-lines, one line running east and west and the other north and south. Fig. 2 is a view showing the arrangement of the spring-jacks and circuits at an intermediate station in normal condition.

In Fig. 1, A and B represent the spring-jacks of the north-and-south line, and A' and B' those of the east-and-west line; C and C', the signal devices or annunciators of the respective lines. D represents a switch-board, to which are connected, in the ordinary manner, the local subscribers at the intermediate station.

The spring-jacks A and B, as shown in Fig. 2, have the same general form of a well-known spring-jack now in common use, which consists of a frame, *a*, a spring, *b*, and a contact-

point, *c*, said spring *b* being normally in electrical contact with the contact-point *c*, and adapted to break said contact by the insertion of a plug. In my through-line spring-jack I have added a contact-point, *d*, which I term the "ground-point," said point being completely insulated from the other portions of the spring-jack. I also provide a small spring, *e*, of less resilience than the main spring *b*, said spring *e* being connected at one end with the main contact-point *c*, and adapted to make contact at the other end with the ground-point *d*. This spring *e*, in the normal condition of the spring-jack, is held away from the ground-point *d* by the pressure of the main spring *b*, this pressure being exerted through the medium of a small bar, *f*, of hard rubber, or other insulator, which extends through the frame *a*.

At every intermediate station two of the above-described spring-jacks are used for each through-line, with a signal device in circuit between them, as shown in Fig. 2. The circuit may be traced as follows: from line at N to frame *a* of spring-jack A, through spring *b* and contact-point *c* to annunciator C, thence to spring-jack B, and through contact-point *c*, spring *b*, and frame *a* of said spring-jack, and thence to line at S.

The connections between the different subscribers or stations are made, in the usual manner, by means of plugs and cords. For instance, suppose it is desired to make a connection between a station west of our intermediate station and one south. The call being received in the ordinary manner on the signal device, a plug, *p'*, is inserted in the spring-jack A', to which the west line is directly connected, (see Fig. 1,) and another plug, *p*, inserted in the spring-jack B of the south line, a connection being established between the two plugs in the ordinary manner through a clearing-out annunciator, F'. Upon inserting the plug *p'* into the spring-jack A' the spring *b* will be raised from the contact-point *c*. This movement of the spring *b* relieves the spring *e*, and it closes against the ground-point *d*, thus automatically closing the eastern portion, E, of the line E W through the signal device C to ground. The circuits may now be traced as follows: from the west line at W to spring-

jack A', thence through the plug p' , clearing-out annunciator F', and plug p to spring-jack B, thence out to line at S, and from the east line at E, through spring-jack B' and the signaling device C', to the contact-point c of spring-jack A', and through spring e and point d of said spring-jack to ground. In a similar manner the northern portion, N, of the line N S would be automatically closed through the signaling device C to ground. This line, however, is shown in Fig. 1 connected with subscriber 3 on local switch-board D, and the signaling device C is entirely out of circuit. It will thus be seen that when a connection is made on a through-line in one direction from an intermediate station the portion of the line extending in the other direction and not in use will be automatically closed to ground through a signaling device, and the signaling device at the same time will be thrown out of the circuit of the connected lines.

The signaling devices I have shown in the form of ordinary annunciators; but it is obvious that any other form of signaling device may be used. Individual call-bells may be used, by means of which any desired station may be called without signaling any other station. I have also shown condensers l in a shunt of the signaling device, in order to remove as far as possible the retarding effects of said signaling device upon the telephonic impulses in the circuit of the through-line.

It is obvious that the arrangement of the various parts of the spring-jack may be varied in numerous ways without departing from my invention. I have used a modified form in which the ground-point was made separate from the spring-jack proper, the connecting-spring e being adapted to be forced against said point by the insertion of a plug.

I claim as my invention—

1. The combination, with a telephone-line, of a signaling device in circuit on said line, spring-jacks or switches for making connections with the telephone-line, one switch on each side of said signaling device, a ground-circuit normally open at each of said switches, and means for automatically closing the ground-circuit at one of the switches when a connection is made with the telephone-line at that switch, whereby one portion of the line is closed to ground through the signaling device, when the other portion of the line is in use, substantially as and for the purpose specified.

2. The combination of spring-jacks and a signaling device in circuit on a telephone-line, one spring-jack on each side of the signaling device, a ground-circuit normally open at each of said switches, and means for automatically connecting that portion of the line not used to ground when a connection is made on said line, and simultaneously disconnecting the signaling device from that portion of the line on which the connection is made, substantially as specified.

3. The combination of spring-jacks and a signaling device in circuit on a through telephone-line, one spring-jack being placed on each side of the said signaling device, with means for automatically closing the line to ground through the signaling device in one direction when a connection is made on said line in the other direction, substantially as and for the purpose specified.

4. In a through-line spring-jack, the combination, with a spring and contact-point in the main circuit, said spring being normally in electrical connection with said contact-point, and adapted to break said electrical connection by the insertion of a plug, of a normally-open local ground-circuit adapted to be automatically closed simultaneously with the opening of the main circuit, substantially as and for the purpose set forth.

5. In a through-line spring-jack, the combination, with a frame, a , main spring b , and contact-point c , of a ground-point, d , and spring e , said spring e being adapted to make contact with point d by the insertion of a plug, substantially as specified.

6. A plug, a frame adapted to receive said plug, a spring, and contact-point, said spring being adapted to be lifted from said contact-point when the plug is inserted in the frame, in combination with a ground contact-point, and means whereby the two contact-points are automatically connected together when the plug is inserted in the frame, and automatically disconnected when the plug is removed, substantially as specified.

In witness whereof I hereunto subscribe my name this 30th day of April, A. D. 1883.

CHAS. H. WILSON.

Witnesses:

PAUL A. STALEY,
GEORGE P. BARTON.