

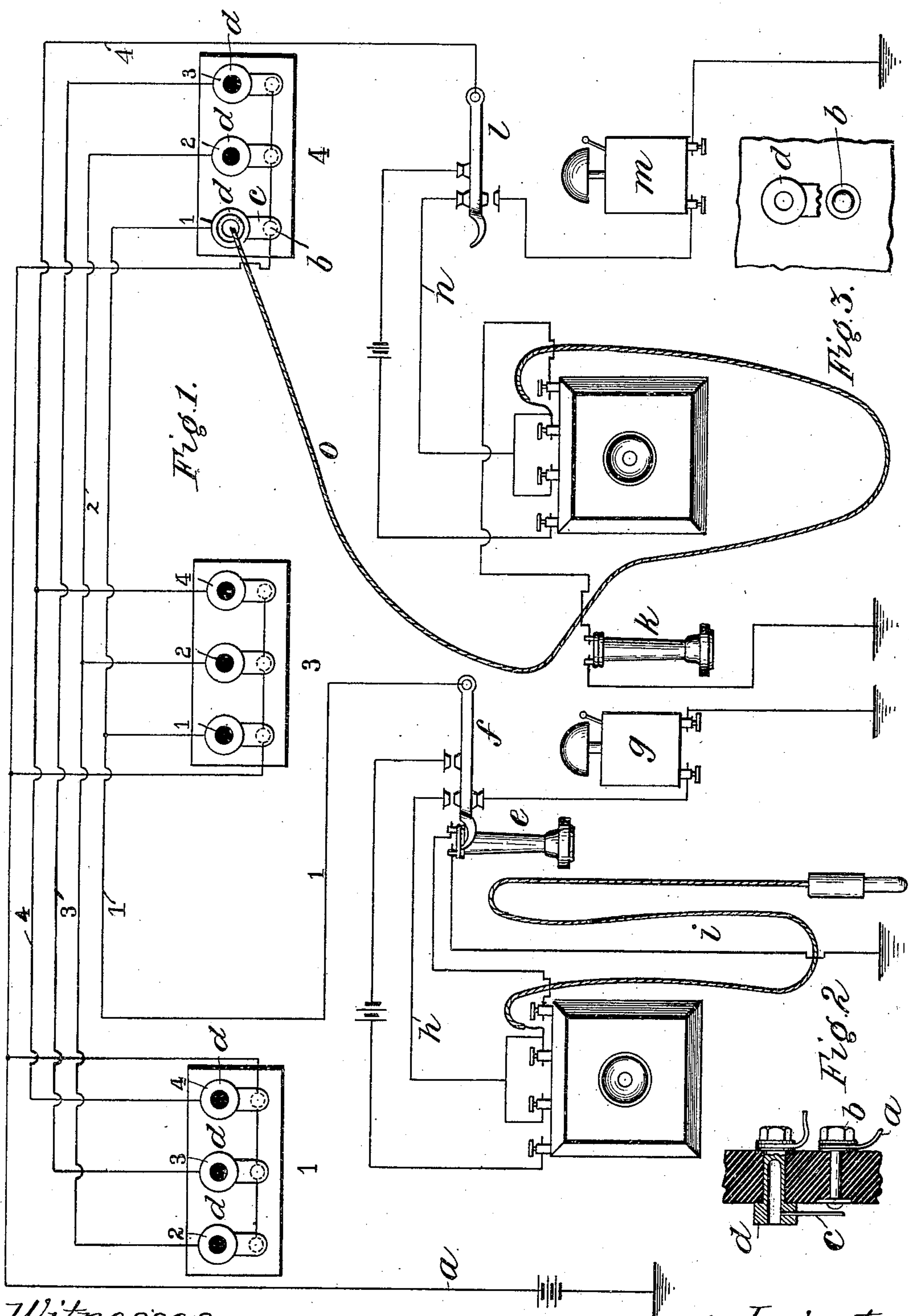
(No Model.)

C. E. SCRIBNER.

FACTORY TELEPHONE EXCHANGE.

No. 356,427.

Patented Jan. 18, 1887.



Witnesses.
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UNITED STATES PATENT OFFICE.

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FACTORY TELEPHONE-EXCHANGE.

SPECIFICATION forming part of Letters Patent No. 356,427, dated January 18, 1887.

Application filed November 6, 1886. Serial No. 218,195. (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 a certain new and useful Improvement in Factory Telephone-Exchanges, (Case 116,) 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 circuits for telephonic communication, and is especially designed for use in factories and stores after the manner of speaking-tubes, in which the number of stations are quite limited in number and not far apart.

The object of my invention is to provide a cheap and efficient apparatus whereby a user at one station may signal any other station, and at the same time find out whether the station wanted is busy or connected for conversation with any other station.

My invention consists in a battery-circuit branched to contact-points at the different stations and individual lines between the different stations, the line of any given station extending to a separate socket at each of the other stations. At each station I provide a telephone-switch and a bell in a ground-circuit, which is connected with a switch-lever when the telephone is hung thereon. The telephone and transmitter at each station are in another branch circuit to ground, which branch is closed when the telephone is removed from the switch and the ground-connection to the bell broken. Between the telephone and the telephone-contact of the switch I provide a cord and plug. This cord is of sufficient length so that the plug may be inserted in the socket which connects with the line of any other of the stations. When one station desires to call up another station, the user, by means of the plug and cord, connects his telephone with the line of the station wanted and closes the switch of said line to the battery contact-point, and as he does this he listens at the telephone. Now if the bell of the station wanted is included in circuit and vibrates to break the circuit intermittently, the caller will hear a

rattling in his telephone, which is caused by the current shunted off through his telephone to ground from the circuit including the battery and the bell at the other station. This rattling will be notice to him that the other station is not busy. If, however, the telephone of the station wanted should be included in the circuit, there will be no interruption or break in the circuit and no rattling in the telephone of the caller. This would indicate to him that the station wanted was busy.

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

Figure 1 is a diagram illustrative of the circuits between three different stations. Fig. 2 is a sectional detail of the socket and key. Fig. 3 is a front view of the battery-contact.

At stations 1 and 4 I have shown telephone outfits, the telephone at station 1 being hung upon the switch, while the telephone at station 4 is shown off from the hook, and the cord, by means of its terminal plug, connected with the socket of line 1.

It will be seen that a battery-circuit, *a*, extends to each of the stations, and connects with contact-points *b* of the different stations. The telephone-line at each station also extends to all other stations. Thus line 1 of station 1 is connected with a socket at station 3, and also with another socket at station 4. Line 4 of station 4 extends in like manner to a socket at each of the stations 1 and 3. As shown in Fig. 2, a spring or switch lever, *c*, extends from each of the sockets *d* over point *b*, which connects with the battery. Thus by pressing in key *c* the battery-circuit *a* may be closed to the line which is connected with the socket *d* of said spring.

Referring to station 1, it will be seen that the telephone *e* is hung upon the switch *f*, and that the switch *f* is closed through bell *g* to ground. The telephone and transmitter are included in another ground-circuit, which circuit, after passing from ground through the telephone and transmitter, is divided into two branches, one branch, *h*, extending to a contact-point near the switch-lever, and the other branch, *i*, consisting of a flexible cord provided with a terminal plug. When the tele-

phone is hung upon the switch *f*, the circuit of line 1 is closed through the bell *g* to ground. On removing the telephone *e*, the switch is disconnected from the bell and closed to branch *h* through the transmitter and telephone to ground. When the plug of branch *i* is inserted in any one of the switches 2 3 4, it is evident that the telephone *e* will be connected with the line in whose socket the plug is inserted.

At station 4 the telephone *k* is shown removed from the switch *l*. The switch is thus disconnected from its bell *m*, and closed to branch *n*, which connects through the transmitter and telephone to ground. The plug of flexible branch *o* is shown inserted in the socket of line 1 of station 4.

The user at station 4, by closing spring *c* to point *b*, may determine whether the switch *f* of station 1 is closed through the bell *g*. This bell *g*, being a buzzer, breaks the circuit as it vibrates, and thus produces a rattling in telephone *k*, if included in the circuit.

The circuits, as shown, may be traced as follows: As before described, line *a* extends from the battery to point *b* of station 4. On closing contact-spring *c* of line 1 to said point *b*, the circuit of the battery may be traced by line 1 to switch *f*, and thence through bell *g* and to ground. Branch *o* being tapped onto said circuit, and the buzzer *g* being, say, of four ohms resistance, current will be shunted off from said branch *o* through telephone *k* to ground, and one listening at the telephone may thus tell by the rattling in the telephone that bell *g* is included in the circuit. This rattling will be notice to the user at station 4 that line 1 is free, and user at station 1, hearing his bell *g* ring, will know that he is wanted and take down his telephone *e* and go to talking. The called user does not connect his plug with any of the sockets at his station. When telephone *e* is removed from switch *f*, the talking-circuits between stations 1 and 4 will be complete. Thus, beginning at the ground at station 4, the circuit may be traced through the telephone and transmitter over branch *o*, as shown, to the socket of line 1 at station 4, thence by line 1 to switch *f* at station 1, and thence, when the telephone *e* is removed, by branch *h* through the transmitter

and telephone to ground. Any user at one station may thus call up the user at any other station and test the line of the user wanted at the same time he is calling.

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

1. Three or more telephone-stations, in combination with telephone-lines extending from each station to the other stations, a battery-circuit extending to each of the stations, a telephone included in a ground-circuit at each of the stations provided with two branches, one to a point near the switch-lever and the other a flexible branch provided with a terminal plug, the switch-lever and vibrating bell at each station, and keys or switching apparatus for closing the battery-circuit and connecting the flexible branch at any station to any other of the telephone-lines, whereby one station may be connected with any other station and simultaneously call the station wanted and test the line of said station, substantially as described.

2. The combination, with a battery-circuit, *a*, extending to points *b*, distributed at different stations, of sockets *d*, a different socket or terminal *d* being provided at each station for each line of the other stations of the system, keys for connecting any of said sockets *d* with the battery-circuit, a telephone in a ground-circuit at each station, and a flexible cord and plug for each telephone and a branch from said telephone to a point of the switch, and a vibrating bell in a ground-circuit at each of the different stations, substantially as shown and described.

3. A telephone, *k*, in a ground-circuit, the branch *o*, connected with line 4, which extends to two or more other stations, the switch *f*, and vibrating bell *g*, in combination with keys *c* for closing line 1 to battery, whereby the bell *g* may be rung, while the user, listening at bell *k*, may hear the interruption of the circuit caused by bell *g*, substantially as described.

In witness whereof I hereunto subscribe my name this 3d day of November, A. D. 1886.

CHARLES E. SCRIBNER.

Witnesses:

GEORGE P. BARTON,
C. C. WOODWORTH.