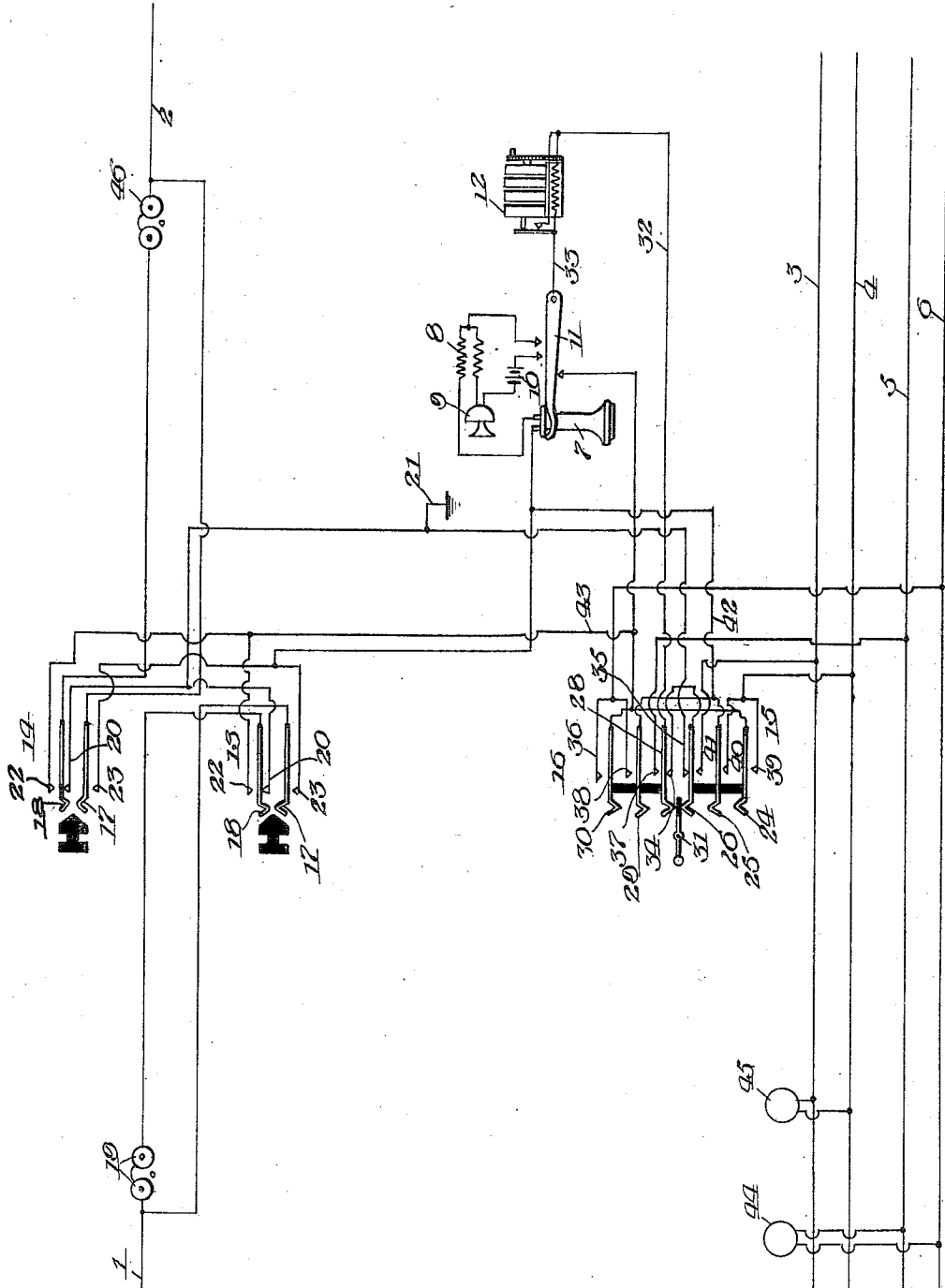


O. T. LADEMAN.
SWITCHING SYSTEM.
APPLICATION FILED SEPT. 2, 1909.

979,676.

Patented Dec. 27, 1910.



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UNITED STATES PATENT OFFICE.

OTTO T. LADEMAN, OF MILWAUKEE, WISCONSIN.

SWITCHING SYSTEM.

979,676.

Specification of Letters Patent.

Patented Dec. 27, 1910.

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To all whom it may concern:

Be it known that I, OTTO T. LADEMAN, citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Switching 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 switching systems, and has for its object the provision of a new and improved form of switching, which finds its greatest application in railway telephone apparatus, and is designed more particularly for use in connection with connecting a telephone at a substation to a number of different lines.

I will describe my invention in detail by reference to the accompanying drawing, illustrating a preferred embodiment thereof, in which I have shown two grounded lines 1 and 2, and two metallic telephone lines, one consisting of the conductors 3 and 4, and the other consisting of the conductors 5 and 6. I have shown these lines as entering a substation, and have provided a telephone set, which is adapted for connection to either one of the four lines above enumerated. This telephone set consists of the receiver 7, induction coil 8, transmitter 9, battery 10, and switchhook 11; likewise, the calling generator 12. I have provided four keys, 13, 14, 15 and 16, respectively. The key 13 has actuating springs 17 and 18, which are connected across the incoming signal 19 of the line 1, and are then connected to said line wire 1, the spring 18 having a back contact 20, which is associated directly with a ground connection 21. The front contacts 22 and 23 are connected to the telephone set, as shown. Similarly, the key 14 is connected to the telephone set at ground, but with the incoming line 2.

It will be seen that whenever key 13 is actuated, it connects the telephone set directly with the line conductor 1 at the ground 21, at the same time grounding the signal 19, through the switchhook 11 and the generator, so long as the telephone is upon the switchhook lever. When the telephone is removed from the switchhook, the signal 19 is disconnected, and said telephone set is connected directly with the line conductor 1. The same is true with respect to key 14, except that it connects the telephone

set similarly with the line conductor 2. The circuits 1 and 2, of course, are not adapted for through conversation to the substation here shown, they being used as block wires. The two metallic circuits, however, are adapted for through conversation, and are likewise in position, by means of my improved apparatus, for use in connection with the substation telephone set here shown. This is accomplished by means of the keys 15, 16, the key 15, for instance, having three contact springs, 24, 25 and 26, actuated conjointly by the actuating device 31. Similarly, a key 16 has contact springs, 28, 29 and 30, likewise under the unit control of the same actuating mechanism 31. It will be seen that the telephone set, as shown normally, has no ground connection, except that such connection is introduced by means of the keys. For instance, when the conductor 32, leading from the generator, which may be short-circuited with the conductor 33, as is well understood, leads directly to the spring 28, and through its back contact spring 34, thence through contact spring 26 and its back contact spring 35, to the ground 21, the front contact springs 36, 37 and 38 of the key 16 connect directly with line conductors 5 and 6. The same is true with regard to springs 39, 40 and 41, except that they connect directly with the metallic circuit 3, 4. It will thus be seen that by actuating the key 15, the telephone set, which is connected to the springs of said key by means of the conductors 42, 43 and 32, can be directly connected with either circuit 3, 4, or directly connected to circuit 5, 6, when actuating key 16.

Selective signal-receiving devices 44 and 45 are shown as connected to the metallic circuits respectively. With the apparatus thus shown, the substation telephone set can be connected to the various circuits, some of which are through circuits, and others of which terminate at the substation.

The various improved circuit connections for arranging the signals 19 and 46, and the connections between the keys 15 and 16, and the conductors, 32, 42 and 43, make this arrangement of particular utility and influence, on account of the simplicity and ease of connecting the telephone set, both to grounded or metallic circuits.

While I have herein shown and particularly described the preferred embodiment of my invention, I do not limit myself to

the precise construction and arrangement, as herein set forth, but

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

1. Apparatus of the class described consisting of a telephone substation set, a through telephone line, two terminating telephone lines, a signal-receiving device for said through telephone line, a signal-receiving device for each terminating line, switching means for connecting said telephone set to either terminating line and simultaneously changing the connection of the signal-receiving device of the selected line to include the local switching devices of said telephone set, and switching means for connecting said telephone set to said through line.
2. Apparatus of the class described con-

sisting of a telephone substation set, a through telephone line, two grounded terminating telephone lines, a signal-receiving device for said through telephone line, a signal-receiving device for each terminating line, switching means for connecting said telephone set to either terminating line and simultaneously changing the connection of the signal-receiving device of the selected line to include the local switching devices of said telephone set, and switching means for connecting said telephone set to said through line.

In witness whereof, I hereunto subscribe my name this 10th day of July A. D., 1909.

OTTO T. LADEMAN.

Witnesses:

JEAN ELLIOTT,

O. M. NENNICH.