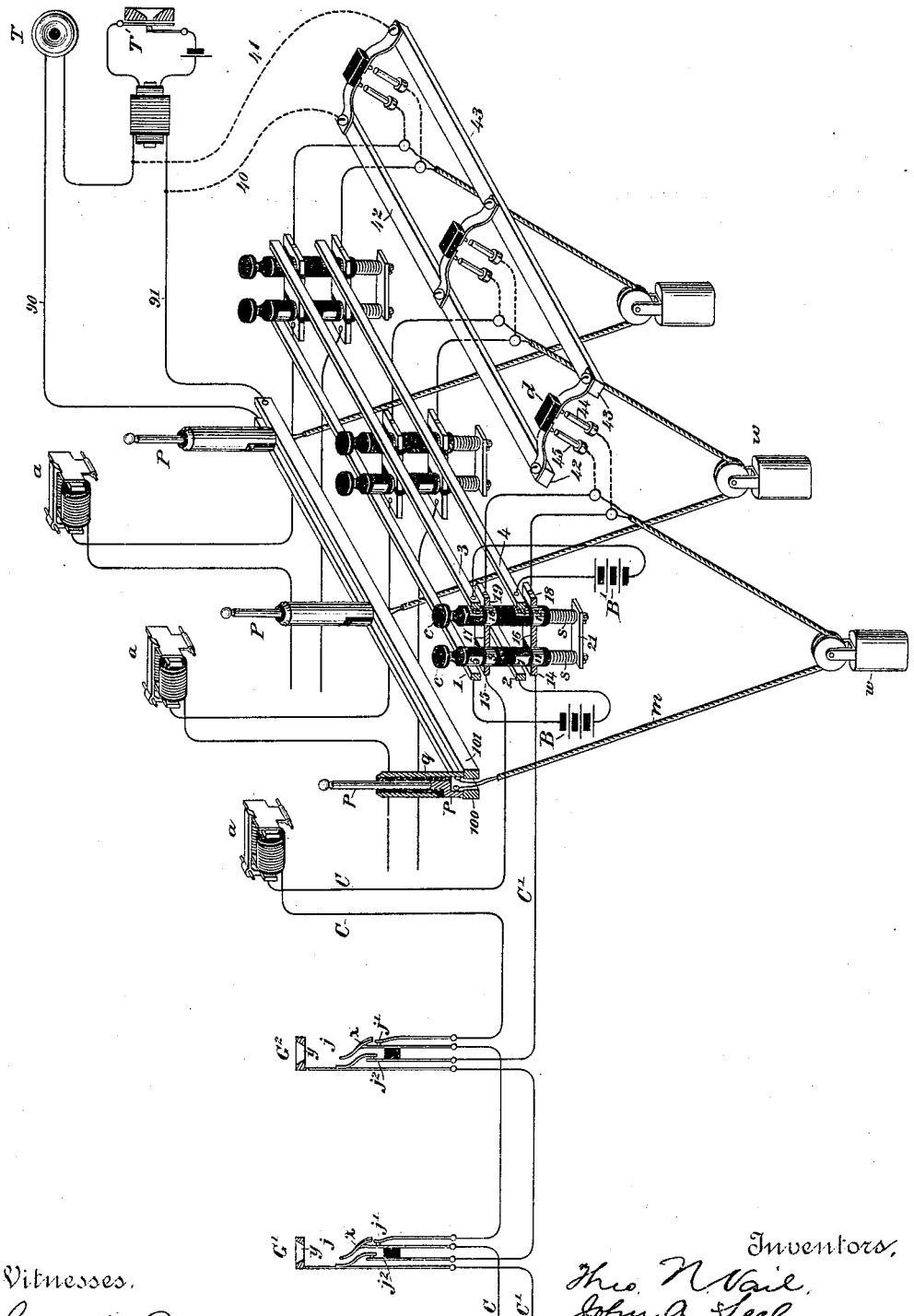
(No Model.)

T. N. VAIL & J. A. SEELY.

TELEPHONE CENTRAL STATION APPARATUS.

No. 385,974. Patented July 10, 1888.



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UNITED STATES PATENT OFFICE.

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TELEPHONE CENTRAL-STATION APPARATUS.

SPECIFICATION forming part of Letters Patent No. 385,974, dated July 10, 1888.

Application filed April 20, 1888. Serial No. 271,296. (No model.)

To all whom it may concern:

Be it known that we, THEODORE N. VAIL and JOHN A. SEELY, citizens of the United States, and residents, respectively, of Boston, county of Suffolk, State of Massachusetts, and of the city, county, and State of New York, have jointly invented certain new and useful Improvements in Telephone Central-Station Apparatus, of which the following is a specification.

Our invention is an improvement in the arrangement of telephone apparatus, whereby intercommunication between distant points is facilitated, while the space occupied and the expense of erecting and maintaining such apparatus are reduced.

Our improvement consists in connecting every sub-station line of a group in multiple arc with an operator's head telephone and in terminating every sub-station line of a group in a flexible connecting-cord normally resting by force of a gravity or equivalent take-up upon strips, conductors, or connections forming the terminals of said operator's telephone. By this means no preliminary signal is necessary, the sub-station merely removing his telephone and speaking into the transmitter his own number or designation and the number or designation of the sub-station required.

The details and arrangement of such a sub-station, with certain novel and improved features, we have described in another application, to which reference may be had, Serial No. 265,297, filed February 25, 1888.

The drawing illustrates a series of metallic circuits entering a central station, passing through a series of multiple boards, and terminating in a group upon one of these boards.

The circuit C C′ enters the first board, G′, passes through a spring-jack, *j*, forming one of the aggregate number on that board, then through a similar jack on the second board, G^2, and terminates, let us suppose, in a group on that board in a flexible cord, *m*, having a double-contact plug, *p q*, the two insulated contacts at its base resting upon continuous strips or contacts 100 and 101. These strips or pairs of strips form the terminals of the opposite ends of line-circuits, and also the terminals, respectively, of a local circuit, 90 91, containing a head telephone, T, and a transmitter, T′, which are continuously in position for use by the operator assigned to that particular group. It is to be observed, therefore, that the operator's head telephone and all the sub-station circuits of the group are connected in parallel circuit, and any order or request telephonically transmitted by a sub-station will be heard by the operator assigned to the group, who raises the plug *p q* and places it in the jack of the called-for circuit, which jack constitutes one of the aggregate number on the same board. Each operator has push-buttons for ringing in either direction and keys for looping a telephone into a circuit after it has been removed from its normal position.

c indicates two separate push-buttons, a similar pair being assigned to each circuit of a group. They consist of cylinders of insulating material, each having two bands of conducting material, 7 and 9, 8 and 10. 15, 17, and 19 are three sections of conducting material, as are also 14 16 18. These sections form a continuous conductor, including the bands 9, 11, 10, and 12, when the buttons are in a normal position. 1 and 2, 3 and 4 are bars of conducting material, each forming the terminals of a generator.

5 and 7, 6 and 8 are contacts for uniting the line and generator when the buttons or either of them is depressed.

S S are springs for returning the buttons *c c* to their normal position. The metal strip 21 furnishes a suitable bearing for the lower end of these buttons.

There is also a looping-in apparatus for each circuit. This is designed for use when the plug is lifted from its normal contact and it is necessary or desirable to listen to operations on the connected circuits. We provide electrical connections 40 41 from the telephone set T to two contacts, 42 43, and the sub-station circuit is electrically connected to two contacts, 44 45, as shown, so that by depressing button *d* a telephone set is connected to the circuit independently of the normal position of the apparatus and without disturbing the two circuits connected together for conversation.

We will now describe the operation of re-

ceiving a call and connecting two sub-stations. Our operator has the head telephone in position. This telephone is normally connected with one hundred circuits, let us suppose. A call is heard, "200 on 900," the first being the number of the calling station, the second that of the station called for. The operator immediately raises plug *p q* of the circuit 200, and, if circuit 900 is idle, places said plug in spring-jack 900. This breaks circuit 900 at points *j' j''* in its jack, and the points *p* and *q* of the two contact-plugs connect with points *x* and *y*, respectively. The two metallic circuits now form one continuous metallic circuit containing a clearing out annunciator at the central station only, being free from the central-station telephone, because all behind the jack *j* of circuit 900 is cut off and the plug of circuit 200 is lifted from its telephone-contact. The central station now depresses the rear push-button to signal the called-for sub-station, circuit passing from circuit 900 to plug *p q*, thence *via* elements 18, 12, 8, 4, B', 3, 6, and 19. The called-for station responds and the conversation is carried on, as is well understood.

Should the central-station operator desire to listen, key *d* is depressed, connecting 42 with 55 and 43 with 44, circuit being from the transmitting-station to plug *p q*, thence *via* cord *m* to point 45, 42, 40, T, T', 41, 43, and 44 to cord *m*. When conversation is concluded, the calling-station sends an impulse from a generator to line, dropping the annunciator, and the parts are restored to their normal position by the operator

We have shown a spring-jack having a dust-guard, *p;* but this feature of improvement we have described and claimed in another application, filed March 1, 1888, Serial No. 265,783.

What we claim, and desire to secure by Letters Patent, is—

1. The combination of a central station, a series of sub-stations, a series of metallic circuits, one for each sub-station, connected in parallel at said central station, a telephone-instrument for each circuit at the sub-station, a receiving-telephone at the central station in a local circuit having fixed electrical contacts, two separable contacts for each metallic circuit, and a suitable device for separately connecting and disconnecting the two terminals of each metallic circuit with the terminals of the local circuit.

2. The combination of a series of sub-stations, a central station, a series of metallic circuits, one for each sub-station, a telephone-instrument for each circuit at the sub-station, a receiving-telephone at the central station, a local circuit having fixed electrical contacts in which the receiving-telephone is permanently located, a flexible cord forming the terminal of each circuit, and a double-contact switch-plug for each cord having electrical contacts registering with the fixed contacts of the local circuit and normally resting thereon, whereby all circuits are connected in parallel with the receiving-telephone and any circuit may be connected and disconnected therewith independently.

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