

T. N. VAIL.
Circuits and Signaling Apparatus for District
Telegraph and Telephone Systems.
No. 224,855. *Patented Feb. 24, 1880.*

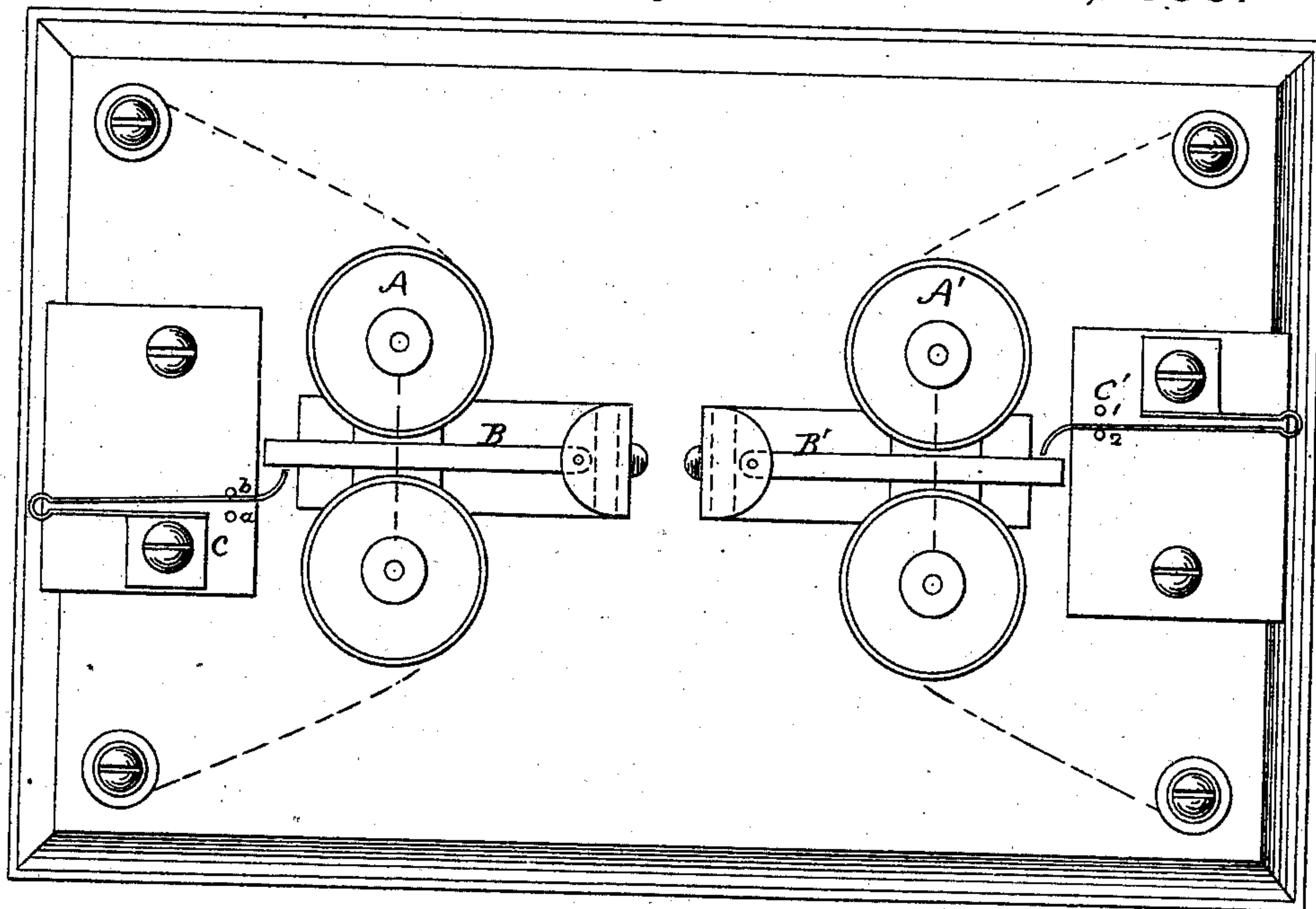


Fig. 2.

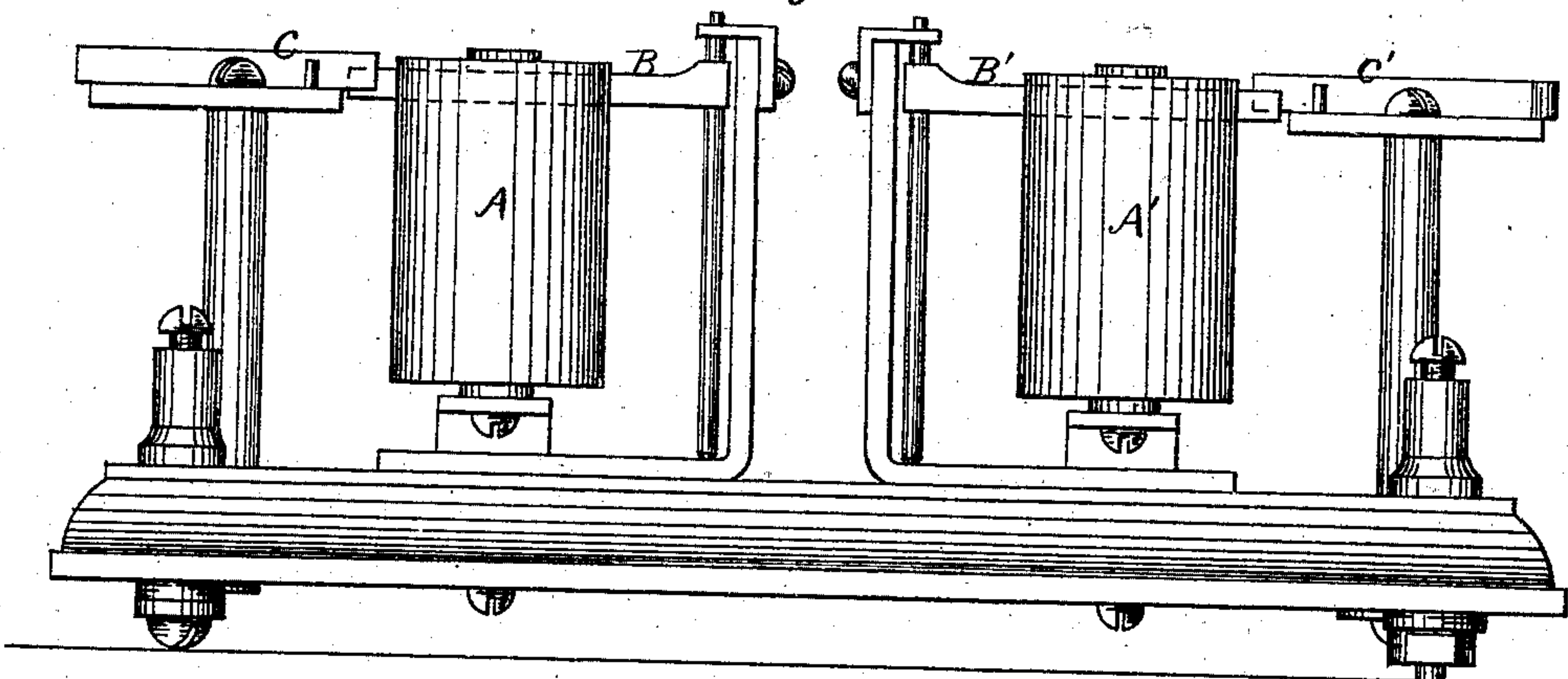
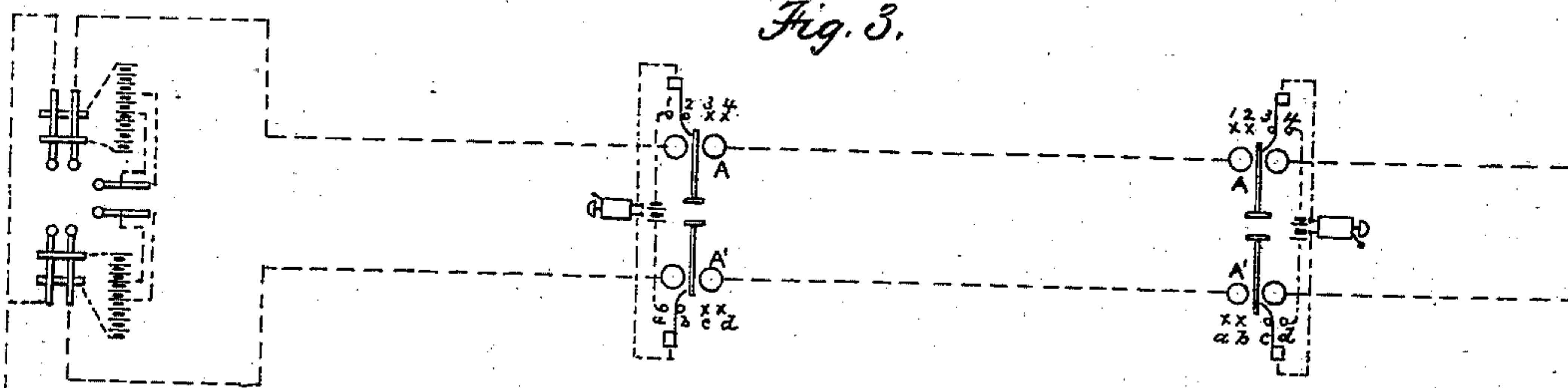


Fig. 3.



Witnesses.
C. F. Brown
E. W. Pierce

Inventor.
Theodore N Vail
by his Atty.
Alex. L. Hayes

UNITED STATES PATENT OFFICE.

THEODORE N. VAIL, OF BOSTON, MASSACHUSETTS.

CIRCUIT AND SIGNALING APPARATUS FOR DISTRICT TELEGRAPH AND TELEPHONE SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 224,855, dated February 24, 1880.

Application filed August 20, 1879.

To all whom it may concern :

Be it known that I, THEODORE N. VAIL, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Circuits and Signaling Apparatus for District Telegraph and Telephone Systems, of which the following is a specification, reference being had to the accompanying drawings.

The object of this invention is to facilitate the sending of individual signals to a series of communicating stations in a district-telephone system; and to this end the invention consists in the combination, with two or more circuits passing through the several stations in the system, of apparatus at each station acting to cause the production of a signal by the joint action of changes in the electrical condition of the several circuits, and of an individual signal at each station by a different combination of these changes for each of the several stations in the circuits.

It will be obvious to the electrician that this result can be accomplished in many different ways. When there are two main circuits it can be accomplished by the use at each station of the double polarized relay invented by myself and George L. Anders, of Boston, Massachusetts, for which we have filed an application for a patent of the United States.

In the accompanying drawings, Figure 1 is a plan view of this relay. Fig. 2 is a side view of the same; and Fig. 3 is a diagram showing the manner of using this double relay with two circuits passing through the several stations of a district-telephone system.

In these several figures the same letters refer to the same parts.

A A' are the electro-magnets of the relay; B B', the polarized tongues; and C C, springs, against which the polarized tongues make contact when a weak current is transmitted, and which springs make contact with points *a* 1 when the current is strengthened.

It will thus be seen that four contacts can be made by each magnet, according to the polarity and the strength of the current.

The signal-bell at each station may be placed in a local circuit, as shown in the diagram Fig. 3, which circuit will be closed when a

contact is made at the same time on each side of the relay by each magnet; but at each station the contacts will be different, so that the currents which will cause the bell at any one station to ring will not close the local circuit and cause the ringing of the bell at any of the other stations. This is shown in the diagram, in which it will be seen that the local circuit through the signal-bell at station 1 is closed by making contact at the same time on point 1 with the magnet A and on point *a* with the magnet A' by currents of one polarity, while the local circuit through the signal-bell at station 2 is closed at the same time, making contact on point 4 with the magnet A and on point *d* with the magnet A' by currents of the other polarity.

It will thus be seen that with this arrangement, when a current of a certain polarity and of a certain strength is used with one of the magnets of the relay to make a contact on one side, four different contacts can be made on the other side by the other magnet by sending currents of different polarity and of different strength, and consequently by sending two currents in different combination from the central office sixteen stations on the line can each receive an individual signal.

A local circuit at each station may be dispensed with, and the current from one circuit may be shunted through the signal-bell magnet when the proper connections are made.

The connections with the telephones are made in the usual manner, and therefore are not shown.

I do not confine my invention to the use of two circuits, or to the use of the electrical conditions described; but

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a district telegraph or telephone system, a series of stations on two or more circuits, in combination with an apparatus at each station for receiving calls from the central office operated on both or all the circuits, in which apparatus, by a different combination for each station of changes in the electrical condition of the several circuits, an individual call for each station is produced, substantially as and for the purpose set forth.

2. In a district telegraph or telephone system having two parallel circuits, each passing through the same series of stations, the combination at each station of a signal-bell and a
5 double relay operated by a different combination for each station of changes in the electrical condition of the two circuits, and acting when both circuits are worked to close a circuit through the signal-bell magnet, and
10 thus operate the signal-bell and produce an individual signal at each station, substantially as and for the purpose set forth.

3. The combination of the magnets *a a'*, po-

larized tongues *B B'*, springs *C C'*, and their respective contacts, the signal-bell and its circuit, and two parallel main circuits, one passing through one magnet and the other passing through the other magnet, substantially as
15 and for the purpose set forth.

In witness whereof I have hereunto signed
this specification, in presence of two subscribing witnesses, on this 11th day of August, 1879.

THEODORE N. VAIL.

Witnesses:

GEO. L. BRADLEY,
ALEX. L. HAYES.