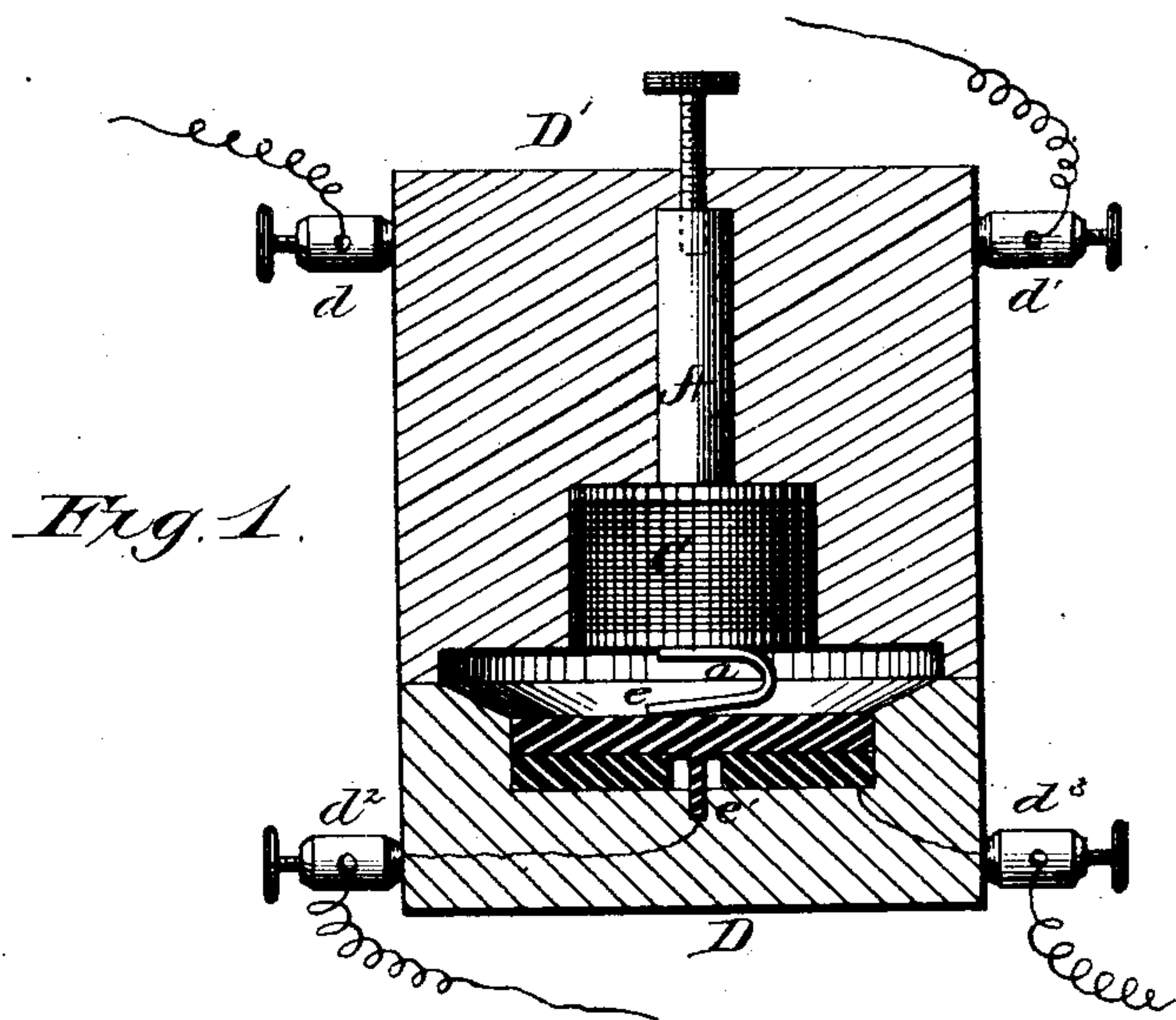


(No Model.)

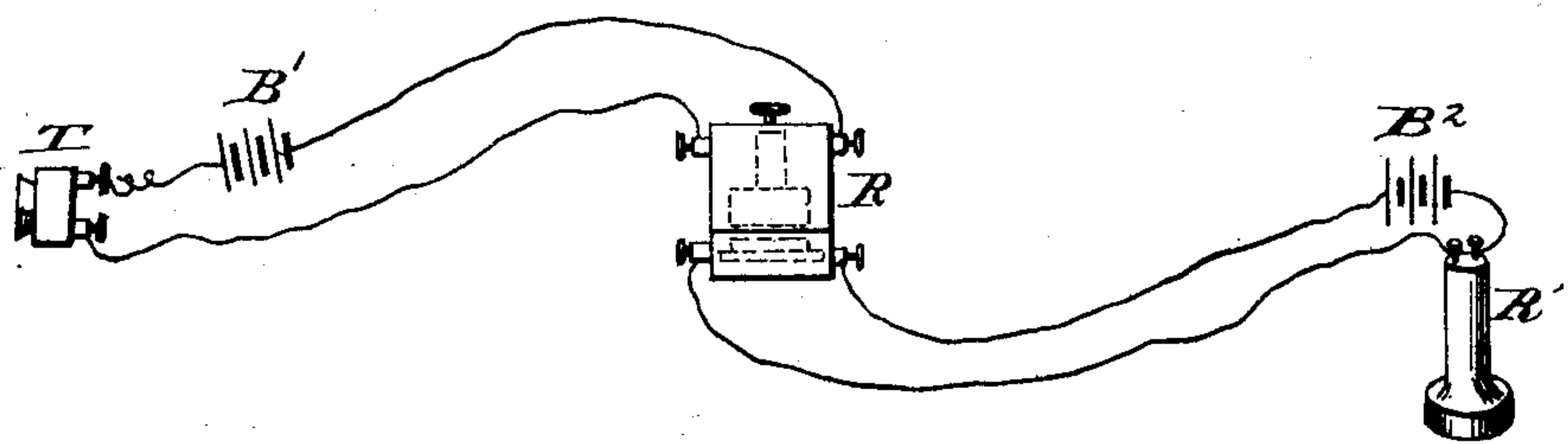
H. E. WAITE.  
TELEPHONE RELAY.

No. 253,793.

Patented Feb. 14, 1882.



*Fig. 2.*



WITNESSES  
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# UNITED STATES PATENT OFFICE.

HENRY E. WAITE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO CHARLES F. LIVERMORE, OF NEW YORK, N. Y.

## TELEPHONE-RELAY.

SPECIFICATION forming part of Letters Patent No. 253,793, dated February 14, 1882.

Application filed June 25, 1881. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY E. WAITE, of Bridgeport, in the county of Fairfield, State of Connecticut, have invented a new and useful Improvement in Telephone-Relays, of which the following is a full and exact description, reference being had to the accompanying drawings, in which—

Figure 1 represents a vertical section through my improved relay, and Fig. 2 is a diagram showing the relation of the relay to the lines which it connects.

My invention relates to a novel construction of relay for connecting one line with and imparting disturbances in the current therein to another and independent line operated by separate battery-power; and it consists in the arrangement of the recurved spring-arm of a magnet arranged within the coil of one line or circuit in contact with one of the electrodes or contact-buttons of a microphone of another and independent line or circuit, whereby the disturbances in the current in one line are imparted to the other line or circuit, as herein-  
after described.

It further relates to the manner of boxing or inclosing the relay for the purpose of increasing its efficiency and preventing disarrangement of its parts.

In the accompanying drawings, A represents a bar-magnet, provided with a reduced and recurved spring or goose-neck extension,  $a$ , of one of its poles, which is provided in close proximity to said arm or extension with a coil, C. Underneath the spring-arm  $a$ , within a suitable block or base-plate, D, is arranged a microphone of any suitable construction, but shown in the present instance as composed of electrodes or contact-buttons  $e$   $e'$ , arranged one upon the other, and connected by suitable wires or conductors with binding-posts  $d^2$   $d^3$ , through which connection is made with one line or circuit. The coil C is connected in a similar manner with binding-posts  $d$   $d'$ , and through said posts with another and independent line or circuit. The spring-arm  $a$  of the magnet A rests upon one of the contact-buttons,  $e$ , of the microphone, and serves to impart disturbances in one line or circuit to the other line or circuit, the arrangement being such that when a message has been carried upon one line or circuit as far as it can be with certainty under all the varying condi-

tions of the atmosphere and of battery-power it is automatically imparted to another and independent line operated by separate battery-power, by which it is carried forward to the desired point, or until it becomes necessary to interpose another relay, such as described, for imparting it to still another independent line until it reaches the desired point.

The arrangement of the lines or circuits in connection with the interposed relay is shown in the diagram Fig. 2, T representing the transmitter, and B' the battery of one line, B<sup>2</sup> the battery, and R' the receiver of another line, and R the interposed relay, one of said lines embracing or taking in the coil surrounding the magnet having the recurved arm, and the other the microphone, with which the recurved arm of the magnet is in contact, as shown in Fig. 1.

The relay constructed as described is by preference embedded in cork D D' in such manner as to prevent disarrangement of its parts, and for the purpose also of utilizing molecular action in said material in the impartation of the disturbances in one line to the other; but it may be covered and protected from external disturbance or disarrangement of its parts in any suitable manner.

Having now described my invention, I claim—

1. In a telephone-relay, the combination of a magnet provided with a recurved spring-extension of one of its poles, a coil surrounding said magnet and arranged within one line or circuit, and a microphone arranged within another and independent line or circuit, the recurved arm of the magnet resting in contact with one of the electrodes of the microphone, substantially as described.

2. In a telephone-relay, the magnet surrounded by the coil of one line or circuit, and provided with the recurved arm resting upon and in combination with the microphone of another and independent line, said magnet, coil, and microphone being inclosed in a box or case, preventing their displacement.

In testimony whereof I have hereunto set my hand this 22d day of June, A. D. 1881.

HENRY E. WAITE.

Witnesses:

ALEX. MAHON,

J. W. HAMILTON JOHNSON.