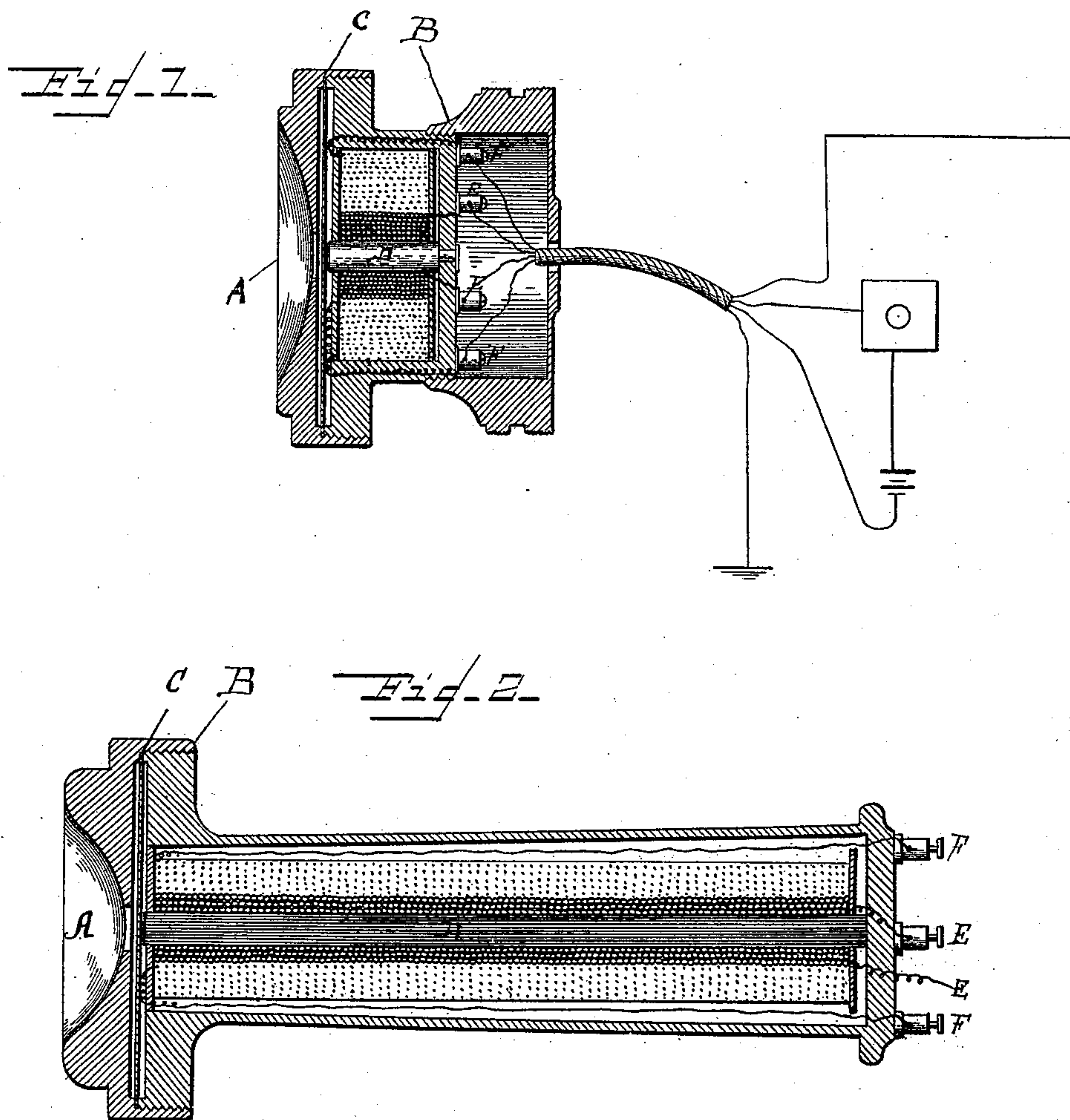


(No Model.)

F. C. WATKINS.
TELEPHONE RECEIVER.

No. 355,424.

Patented Jan. 4, 1887.



Witnesses
Edwin L. Yewell,
E. H. Bradford

Inventor
Frank C. Watkins
By his Attorney H. J. Lewis

UNITED STATES PATENT OFFICE.

FRANK C. WATKINS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY
MESNE ASSIGNMENTS, TO THE UNITED STATES KROTOPHONE COMPANY,
OF NEW YORK, N. Y.

TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 355,424, dated January 4, 1887.

Application filed April 27, 1886. Serial No. 200,371. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. WATKINS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Telephone-
Receivers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled
10 in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

15 My invention has relation to telephone-receivers; and the object is to provide a simple and reliable receiver without the use of a permanent magnet, and at the same time operate successfully in the direct or primary trans-
mitter-circuit, thus dispensing with the induction-coil in the transmitter; and to these ends the novelty consists in a receiver provided with an iron diaphragm and a soft-iron
20 core surrounded by a helix of iron wire, which in turn is surrounded by a secondary helix of copper wire, as will be hereinafter more fully described, and particularly pointed out in the claim.

In the accompanying drawings the same letters of reference indicate the same parts of the invention.

Figure 1 is a longitudinal section of my improved receiver, and Fig. 2 is a modification of the same, showing a larger form of receiver
35 adapted to long-distance signaling.

A is the mouth or ear-piece, and is secured in the usual form to the body B, and C is the diaphragm of the ordinary construction.

40 D is the soft-iron core, which is surrounded by a helix of iron wire, terminating in the posts E E, and on the outside of the iron helix is a secondary coil of copper wire terminating in the posts F F.

It will thus be seen that two independent circuits run through the receiver, one through
45 the iron coil, and a second one through the copper coil. The circuit in the iron coil is completed through the local circuit of the transmitter, and one end of the second or copper circuit is grounded and the other runs to
50 the line.

The variations of the transmitter-circuit in the primary iron coil are inductively amplified in the secondary copper coil, and in this condition transmitted to the receiver at the
55 other end of the line, and the varying intensity of the current correspondingly affects the magnetic state of the iron helix and core, so as to produce a motion of the diaphragm, and at the same time any foreign induced influ-
60 ence on the line is reduced to a minimum through the interposition of the iron helix.

In the modification shown in Fig. 2 the same construction is employed, except that the iron core and the iron and copper helices are length-
65 ened out to get a larger amount of wire close to the core and amplify the magnetic action when the receiver is used with high resistance, or on very long line.

Having thus fully described my invention, 70 what I claim is—

A receiver composed of a diaphragm and a soft-iron core surrounded by a helix of iron wire, said helix being in turn surrounded by
75 a secondary helix of copper wire, the two helices being insulated from each other, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK C. WATKINS.

Witnesses:

H. J. ENNIS,
JNO. N. OLIVER.