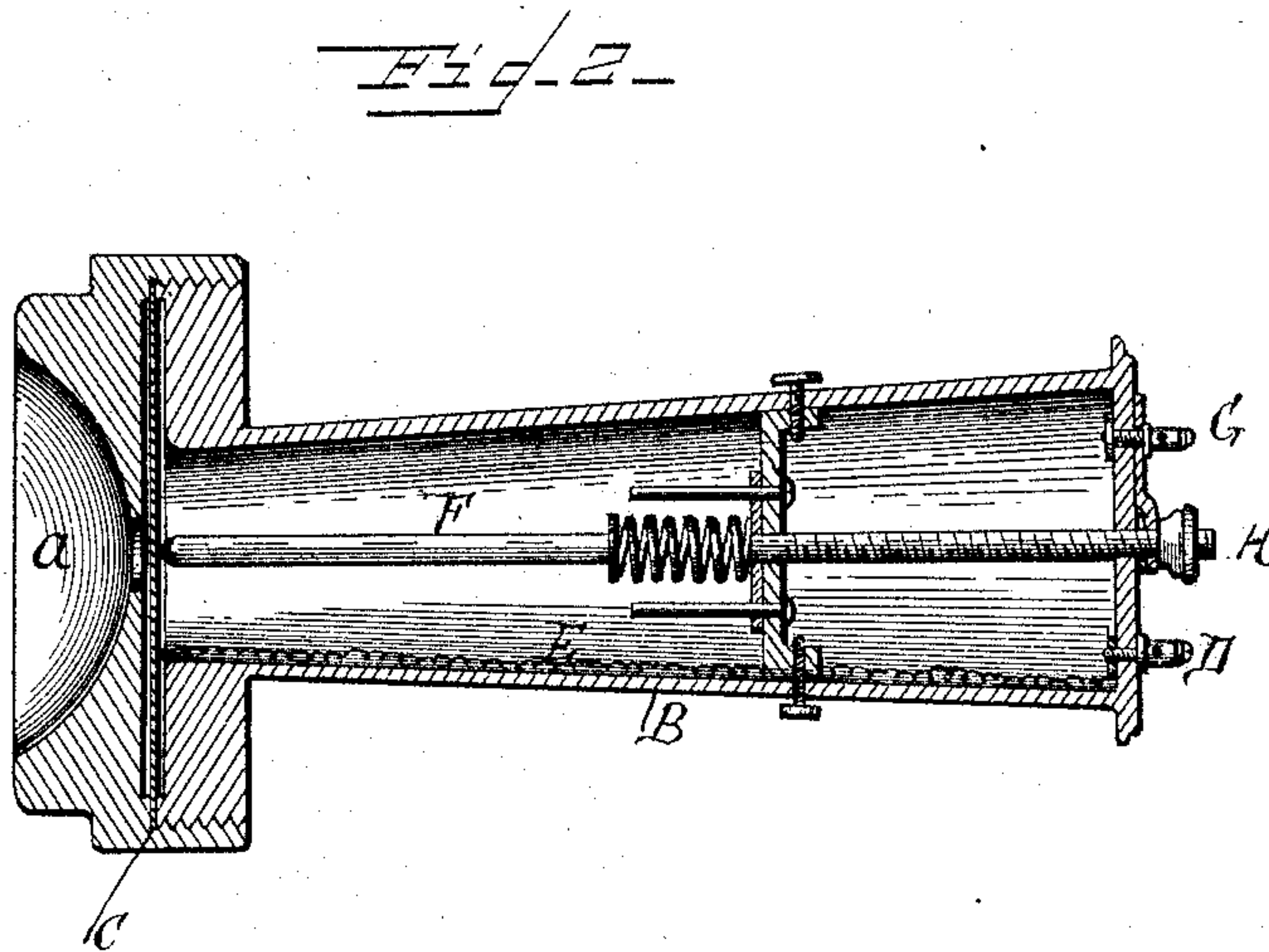
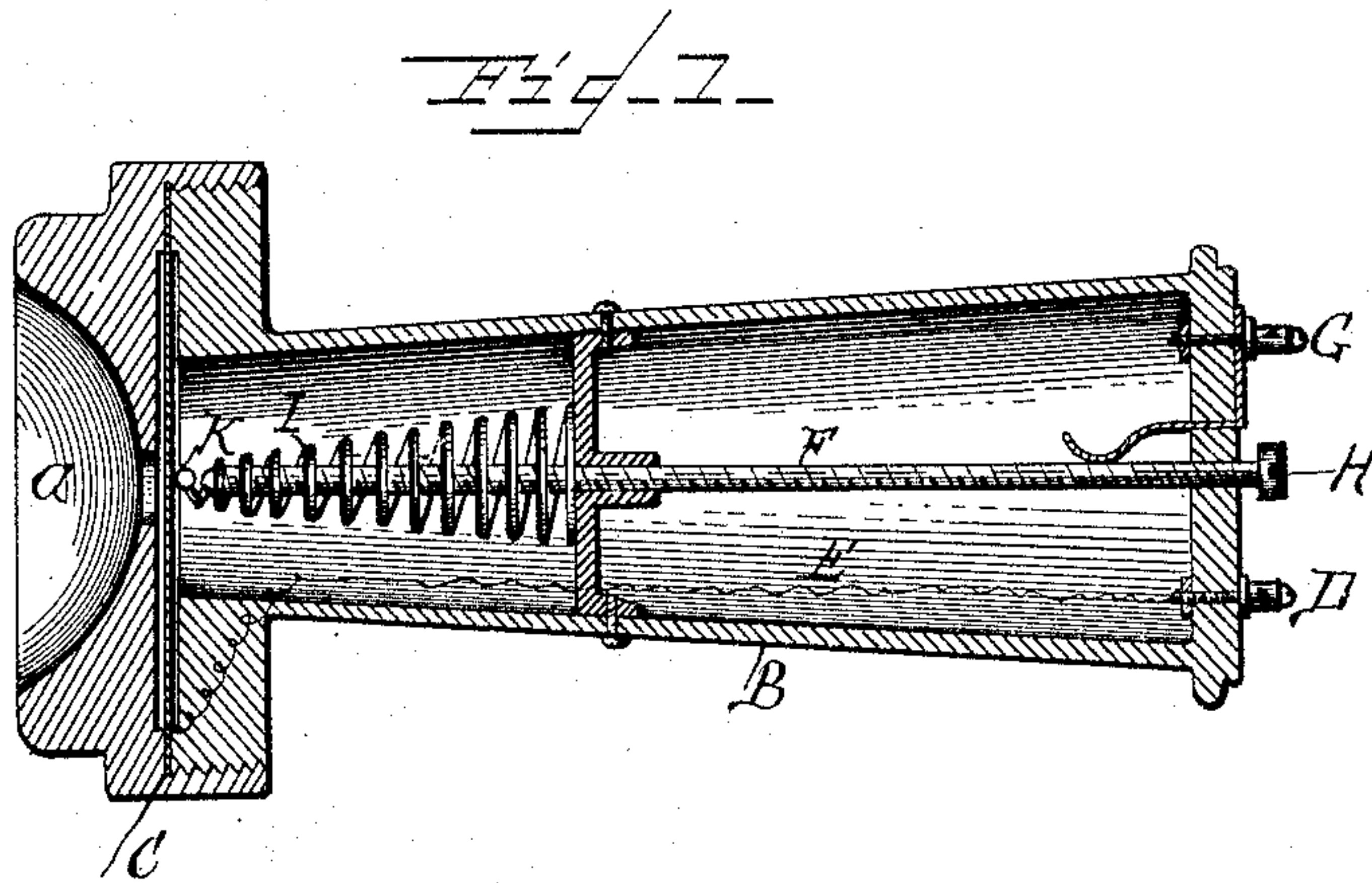


(No Model.)

F. C. WATKINS.  
KROTOPHONE RECEIVER.

No. 357,054.

Patented Feb. 1, 1887.



Witnesses

Edwin L. Yewell,

C. H. Bradford

Inventor

Frank C. Watkins

By his Attorney

H. J. Eunis

# 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.

## KROTOPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 357,054, dated February 1, 1887.

Application filed June 26, 1886. Serial No. 206,371. (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 Krotophone-  
Receivers; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled 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 or reference marked thereon, which form a part of this specification.

My invention has relation to krotophone-receivers, and the object is to provide an instrument of this class that will automatically adjust itself to correspond to the variations of the current; and to this end the novelty consists in the combination, construction, and arrangement of the parts of the same, as will be hereinafter more fully described, and particularly pointed out in the claim.

My invention is an improvement upon the patents granted July 6, 1886, to Edward S. Spaulding, and numbered 345,085 and 345,086.

In the accompanying drawings similar letters of reference indicate like parts of the invention.

Figure 1 is a longitudinal section of my improved receiver, and Fig. 2 is a modification of the same.

A is the ear-piece, and B the handle, having the diaphragm C secured therein in the usual manner, the diaphragm being connected to the binding-post D by the wire E.

F is a permanent magnet, and is in electrical connection with the post G, and may be longitudinally adjusted by means of the screw H, and I is a conical iron helix, the larger end of which is permanently secured to the magnet F, and its smaller end terminates in a polished ball, K, extending a short distance beyond the free end of the magnet and in contact with the diaphragm, the normal pressure of the ball K on the diaphragm C being regulated by the screw H.

The passage of the current through the magnet increases and diminishes the pressure on the diaphragm, and this effect is amplified by the contracting tendency of the iron helix when electrically excited by the current and magnetically affected by the magnet, thus audibly reproducing the impulses on the line.

In the modification the polished end of the permanent magnet is in contact with the diaphragm, and the iron helix is secured at one end to the magnet and at the other to the adjusting-screw H, the operation being the same as in Fig. 1.

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

The combination, with the diaphragm C, of the permanent magnet F in electrical connection therewith and provided with the helical conductor I, as set forth.

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

FRANK C. WATKINS.

Witnesses:

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