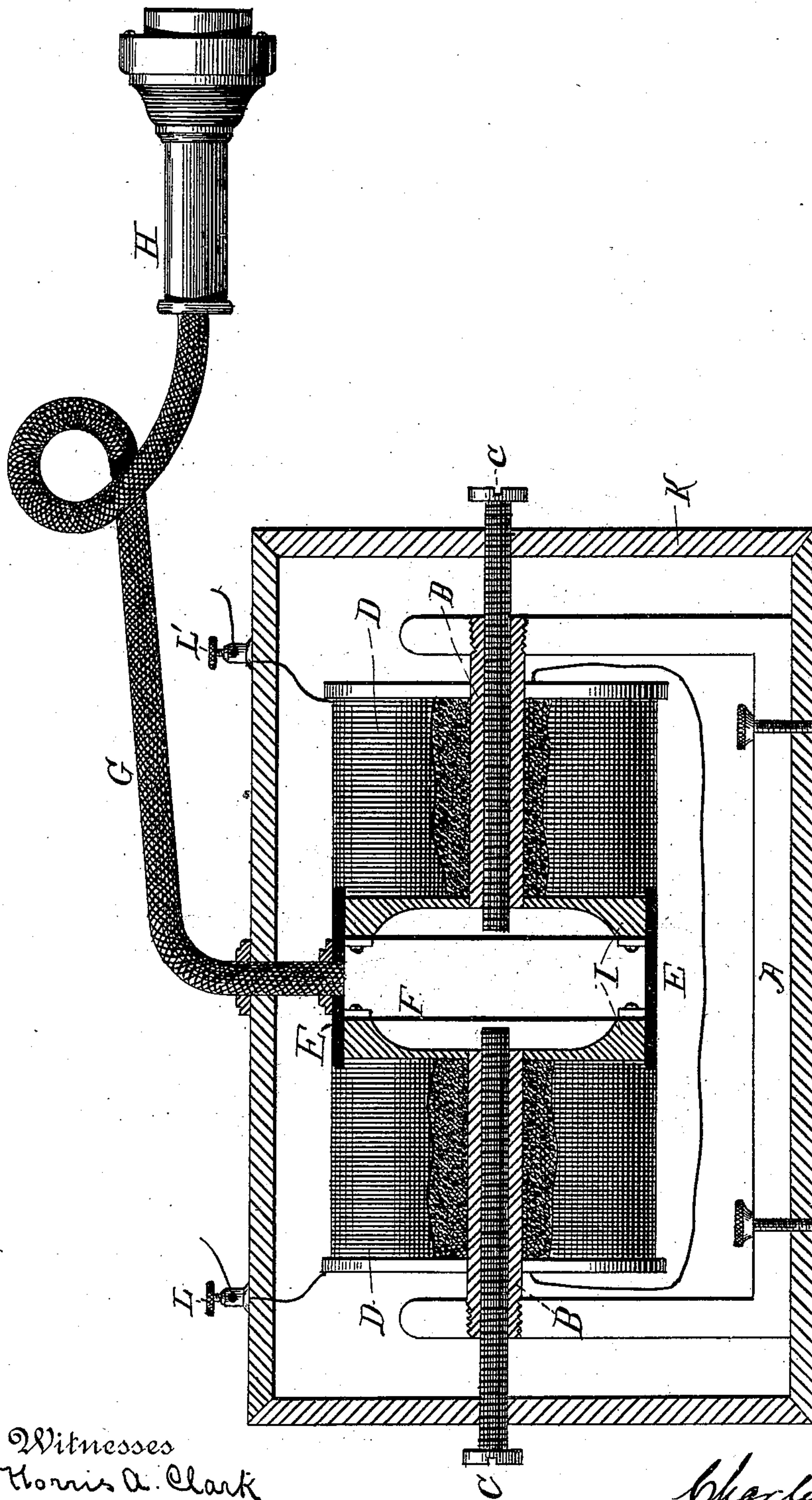


(No Model.)

C. E. EGAN.  
TELEPHONE.

No. 355,685.

Patented Jan. 11, 1887.



Witnesses  
Thomas A. Clark

S. Brashear

Inventor

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By

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# UNITED STATES PATENT OFFICE.

CHARLES E. EGAN, OF COLUMBUS, OHIO, ASSIGNOR OF ONE-HALF TO  
W. Y. MILES, OF SAME PLACE.

## TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 355,685, dated January 11, 1887.

Application filed April 6, 1886. Serial No. 197,963. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. EGAN, of Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful  
5 Improvements in a Combined Magneto Transmitter and Receiver; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable  
10 others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawing, and to the letters of reference marked thereon, which forms part of this specification.

My invention relates to telephonic transmitters and receivers; and it consists in the combinations and arrangements hereinafter described, and more particularly pointed out in the claims.

The drawing shows a side elevation of my improved telephone, certain parts being broken away for the sake of greater clearness.

A is a permanent magnet, turned up at each end, as shown, to form standards, in each of which is secured a soft-iron core, B. Each  
25 core is tubular and is screw-threaded interiorly to receive the screws *c c*, which are considerably larger than the cores, so as to project from each end of them. Surrounding each core is a coil of insulated wire, D, the  
30 terminals of which are connected by means of the binding-posts *L L'* with the line-wire and ground. These two electro-magnets confront each other, and the space between the ends of the coils is inclosed by a ring, E, of hard rubber or other suitable material, which supports  
35 two diaphragms, F F, adjacent to the two cores B B. At one side of the chamber formed by the ring E and the diaphragms F F is an opening, from which extends a flexible sound-conveying tube, G, which leads to a suitable  
40 ear-trumpet or mouth-piece, H. Filling-pieces I, of hard rubber or other material, force the sound-waves at the center of the diaphragm.

The entire apparatus is inclosed in a case, 45 K, and, if desired, the screws *c c* may project through the sides of the case, as shown.

With this construction I am able to obtain a much better effect than usual, since both diaphragms act simultaneously and the two 50 electro-magnets seem to re-enforce each other. The instrument may be used as a transmitter, but is most effective as a receiver. The flexible tube facilitates its use and gives better results than a simple mouth-piece. The screws 55 *c c* are of importance, since by means of them the effective length of the cores can be adjusted with great accuracy without disturbing the position of the cores themselves. By having these screws project through the sides of 60 the case K they can be readily adjusted without opening the case.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A telephonic instrument comprising the annular ring or shell E, of insulating material, the parallel diaphragms F, arranged inside said ring and forming a continuous closed chamber, the permanent magnet A, having 70 cores B at both poles, the helices D, fitted on said cores and fitting the diaphragms, the filling-pieces I between the helices and diaphragms, and the mouth piece or tube communicating with the closed chamber between 75 the diaphragms, as set forth.

2. The combination, with the permanent magnet A, of the coils D, the tubular cores B, the screws *c c*, the diaphragms F F, the ring E, and the tube G. 80

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CHARLES E. EGAN.

Witnesses:

O. E. DUFFY,

O. S. BRASHEARS.