

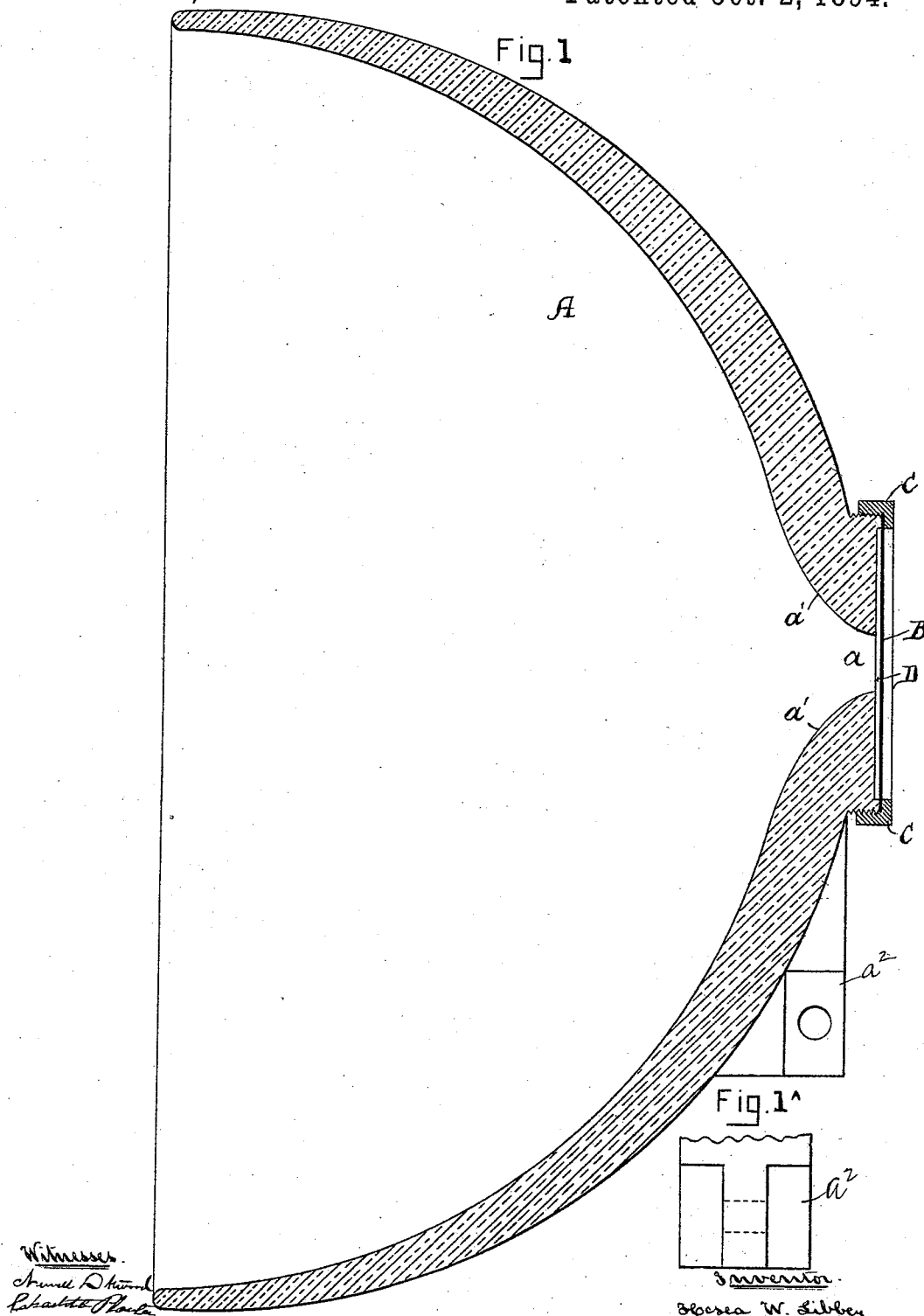
(No Model.)

2 Sheets—Sheet 1.

H. W. LIBBEY.  
TELEPHONE.

No. 526,865.

Patented Oct. 2, 1894.



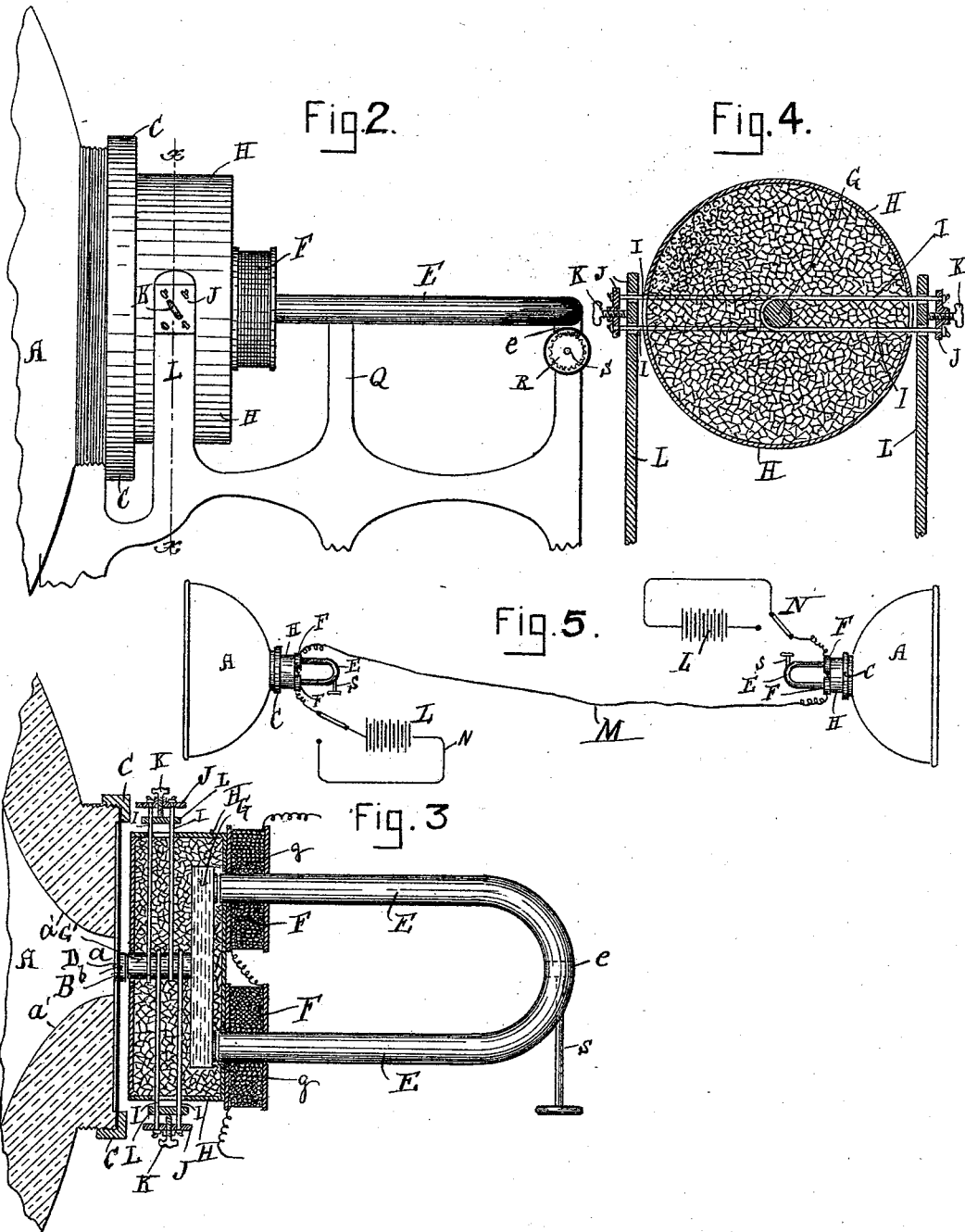
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Witnesses  
J. W. H. Howard  
Charles Plante

Inventor  
Hosea W. Libbey  
by Edmund Plante  
attorney.

# UNITED STATES PATENT OFFICE.

HOSEA W. LIBBEY, OF BOSTON, MASSACHUSETTS.

## TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 526,865, dated October 2, 1894.

Application filed August 1, 1892. Serial No. 441,786. (No model.)

### *To all whom it may concern:*

Be it known that I, HOSEA W. LIBBEY, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Telephones, of which the following, taken in connection with the accompanying drawings, is a specification.

The object of my invention is to produce a combined transmitter and receiver for telephonic purposes whereby the human voice or other sounds produced at a distance from the instrument will be concentrated, transmitted and delivered so as to be audible to a person at a distance from the corresponding instrument at the other end of the line and vice versa.

The invention consists in certain details of constructions hereinafter fully described and pointed out in the claims.

Referring to the accompanying drawings: Figure 1—represents a vertical section of a resonant semi-globose sound receptacle or distributor embodying my invention. Fig. 1<sup>a</sup>—is a rear view of a portion of the same showing its formation to attach it to the stand. Fig. 2— is a side view of a combined transmitter and receiver embodying my invention. Fig. 3— is a plan or top view of the same. Fig. 4— is a transverse section taken on line *x, x*, of Fig. 2. Fig. 5— is a diagram showing the connection between two such instruments.

A, represents a resonant semi-“globose” sound receptacle or distributor, preferably formed of glass, and having an opening *a*, at its rear end, the inner face being rounded on an easy curve *a'*, to said opening so as to receive and emit sound without resistance. When it is desired to secure the receptacle and distributor to a table, the rear portion of it may be provided with a projection as perforated ears *a*<sup>2</sup> which can be pivotally secured to any desired base or support.

B, is a disk or diaphragm secured a short distance from the rear of the receptacle or distributor A, by a screw threaded ring C, the space D, between the receptacle A and the diaphragm forming an air chamber.

E, is a horse shoe magnet having a coil F, upon each of its poles.

G, is an armature having a central projection G', said armature being arranged in a box or case H, and supported by means of pieces of cat gut, silk or other suitable material I, passed round the projecting piece G', and through the sides of the box H, the end of said cat gut being secured to plates J, through each of which is passed a thumb screw K, the end of which has a bearing against a standard L, so that as the thumb screws K, are tightened up the cat gut will be stretched to its fullest extent and thus support the armature G, forming a spring support so that it (the armature) is free to vibrate according to the sound waves that are imparted thereto by the diaphragm B, or the horse shoe magnet E.

To the rear of the disk B, is secured a carbon button *b*, which is in contact with the armature, and to the armature opposite the poles of the magnet E, is secured carbon buttons *g*, which prevent contact with the magnet E, said buttons *b, g*, forming microphonic contacts between the diaphragm B, armature G, and the horse shoe magnet E.

The box or concentrating chamber H, is formed of hard rubber or other suitable insulating material, and this box is filled with sponge or other suitable material which is preferably saturated with a weak solution of glycerine or any suitable material to maintain its elasticity and prevent it matting whereby the resistance of the armature G, is varied, the sponge acting as a spring force in the varied resistance when actuated by sound waves.

A battery L, at one end of the line is connected to one of the coils F, by a switch *f* which coil is connected to the coil F, on the other pole of the horse shoe magnet, said coil being connected by a live wire M connected to one of the coils F on the magnet at the other end of the line, which connects with the coil F on the other pole, said coil being connected to the ground by the switch *f'*. N, N, are wires leading from the batteries L, L, to the ground. When it is desired to send the current in the opposite direction the positions of the switches *f*, are reversed.

The horse shoe magnets E, are each supported near their forward ends by resting

upon a frame Q, and at their rear ends are formed with a rack e on their under side which rack rests upon and works in a cog wheel R, on shaft S, so that by adjusting the shaft S, the poles of the magnet may be brought nearer to or farther from the armature G.

Although I have shown and described the instrument as standing longitudinally to adapt it to rest upon a table or desk, it is obvious that if desired it might be supported so as to receive and deliver sounds over head.

What I claim is—

1. In a telephone, an armature arranged between the poles of a horse shoe magnet, and the diaphragm, said armature being suspended by cat gut or silk cord as set forth.

2. In a telephone, a box or case inclosing an armature arranged between the poles of a horse shoe magnet, and the diaphragm, said armature being suspended by cat gut, and surrounded by sponge or its equivalent saturated or filled with a suitable material as set forth.

rated or filled with a suitable material as set forth.

3. In a telephone the combination of a resonant semi-globose sound receptacle or distributor A, diaphragm B, armature G, supported by cat gut or silk cord I, and adjustable horse shoe magnet E, substantially as set forth.

4. In a telephone, an armature having a central projection over which is passed cat gut or silk cord, for suspending the same, and which acts as a spring tension, and produces fine vibrations as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 29th day of April, A. D. 1892.

HOSEA W. LIBBEY.

Witnesses:

CHAS. STEERE,  
EDWIN PLANTA.