W. F. COOK.

Electric-Telephones.

No. 219,446. Patented Sept. 9, 1879.

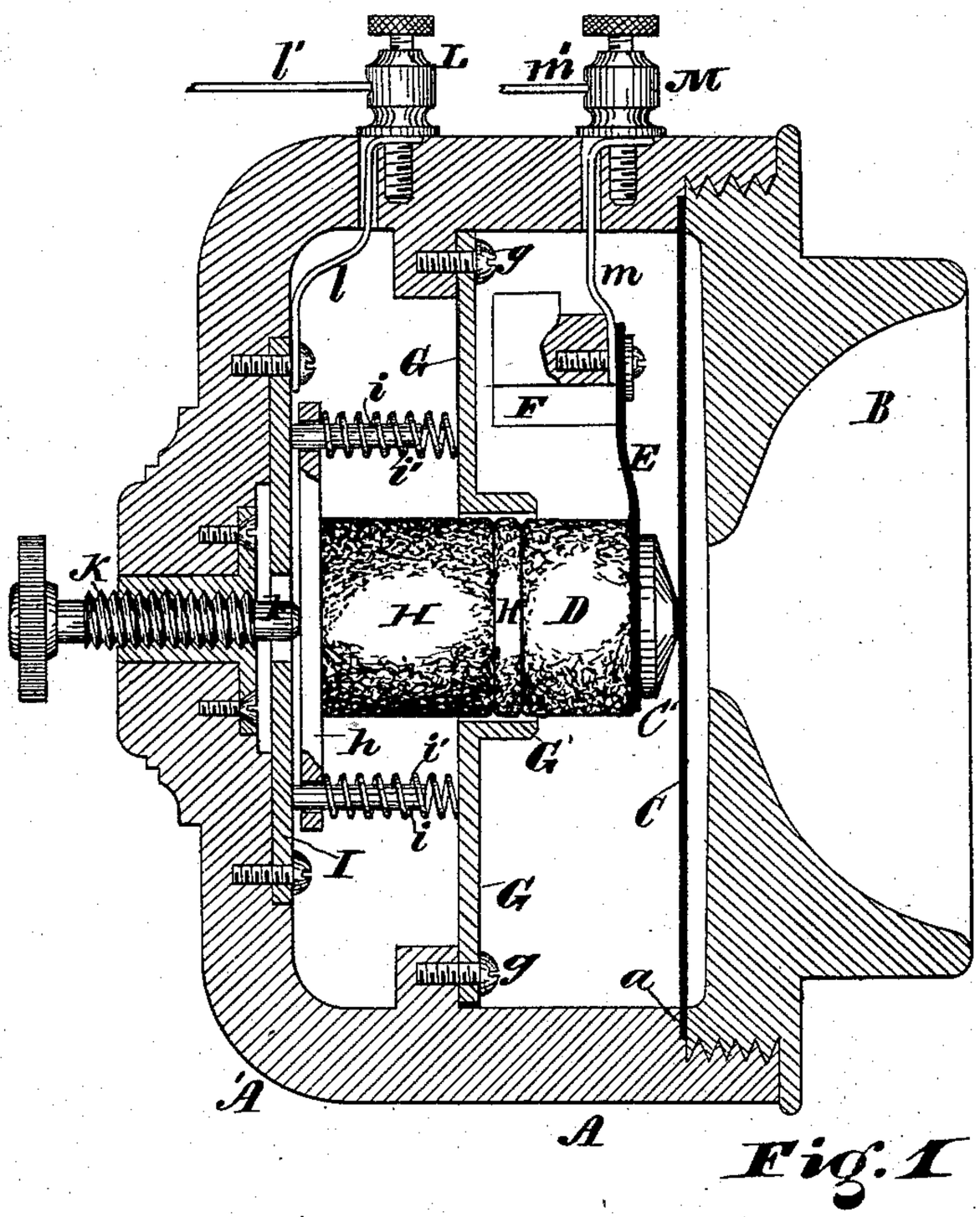

Fig. 1

WITNESSES:

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UNITED STATES PATENT OFFICE

WILLIAM F. COOK, OF IVY MILLS, PENNSYLVANIA.

IMPROVEMENT IN ELECTRIC TELEPHONES.

Specification forming part of Letters Patent No. **219,446**, dated September 9, 1879; application filed June 4, 1879.

To all whom it may concern:

Be it known that I, WILLIAM F. COOK, of Ivy Mills, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Electric Telephones; and I do hereby 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 pertains to make and use it, reference being had to the accompanying drawing, which forms part of this specification, in which the figure is a longitudinal vertical section of my invention.

My invention is based on the fact that if two or more suitable bodies be so juxtaposed in an electric circuit that one of them may be mechanically vibrated with reference to the other, a variation in the electric current sent over such circuit and through such bodies will be produced in its passage from one to the other when sound-waves are thrown upon a diaphragm in contact with such vibratory body, whereby such sound-waves may be transmitted over such circuit or made audible by like means at a receiving-station.

My invention accordingly consists in the novel construction, as hereinafter described and claimed, of a telephonic instrument or telephone adapted for use as a receiver, as well as a transmitter, in which magnets and induction coils are dispensed with, as well as chemical compounds, and which, when placed in an electrical circuit, effects the transmission of and renders audible articulate sounds, by reason of a change produced in the electric current in its passage between two juxtaposed bodies of suitable material placed in such circuit, one of said bodies being so constructed and arranged that it may be mechanically vibrated with reference to the other, such vibratory body being in contact with a metallic diaphragm.

In carrying my invention into effect, I construct a telephone as follows: I take a suitable case or shell of any appropriate material—wood, for example—provided with a trumpet-shaped mouth-piece. Within this case, and close to the inner opening of said mouth-piece, I locate a metallic diaphragm, the outer edges of which are firmly fixed in position, while its center is free to vibrate under the influence of sound-waves. Back of the diaphragm, and in contact therewith, is a button, of vulcanite or other suitable material, fastened to one end of a spring-arm, whose other end is fastened to the side of the case or to a projection therefrom.

Attached to said spring, on the inner side or opposite the vulcanite button, is a button of carbon or gas-coke, D. In contact or juxtaposition with this button is another button or block of similar material, which is fitted in a sleeve, so that it may be adjusted to and from the button to which it is juxtaposed by means of a screw and spring. Both these buttons are, by suitable connections, placed in an electric circuit, so that an electric current passing over such circuit will pass through both and from one to the other. An instrument of this description is placed at either end of an electrical circuit, and electrical connection established by means of a battery or equivalent.

Now, if sound-waves be thrown upon the diaphragm of one of these instruments, they will be reproduced upon the other diaphragm, and articulate speech be thus received and made audible over an electric circuit without the employment of a magnet, induction-coil, or chemical compound.

Referring to the accompanying drawing, A indicates a shell or case of any suitable material—wood, for example—having a blank end, A′, and provided with a mouth-piece, B. C is a metallic diaphragm, whose annular edge rests on a ledge, *a*, in the case, being bound or held fast in position by the mouth-piece B, its center being free to vibrate under the influence of sound-waves thrown upon it.

D represents a button, of carbon or equivalent material, sustained on the end of a spring, E, whose opposite end is sustained on the wall of the case A, or on a support, F, within said case. C′ represents a button, of vulcanite or other suitable material, fastened on the end of said spring opposite the diaphragm. The button C′ is necessarily made of vulcanite, but may be of any form or material, and may even be a part of the spring itself or a part of button D.

G is a bridge, of wood or other non-conducting material, sustained on pins or screws *g g*, and having a tubular opening or sleeve, G′,

which forms an annular guide for a carbon block or button, or a mass of equivalent material, H.

I represents a bar fastened to the bottom or blank end of the case A, and having an ample opening for the passage of an adjusting-screw, K, whose inner end, *k*, impinges on the button H, or against a metallic plate, *h*, to which said button is secured.

The bar I is provided with studs *i i*, which pass through openings in the plate *h*, and are surrounded by spiral springs *i' i'*, which bear against said plate *h* and the bridge G. By these means the button H is adjusted in the direction of the button D by the screw K, and in the contrary direction by the springs *i' i'*. The buttons D and H are in juxtaposition, the former having liberty of mechanical vibration toward and from the button H, or between the latter and the diaphragm C.

L and M are binding-posts, and *l m* wires leading therefrom to the metal spring E and plate I, as shown. From these respective posts wires *l'* and *m'* extend to form electrical connection with another like instrument at any suitable distance, a battery or equivalent generator being duly connected in the usual or any suitable manner.

Speech or other audible sound-waves delivered on the diaphragm of one of these instruments when the electrical connection is established will be transmitted to and received and reproduced by the diaphragm of the other instrument in audible tones.

What I claim as my invention is—

The instrument herein described, consisting of a case, A, with mouth-piece B, diaphragm C, spring-sustained button D, and rigidly-supported button H, with spring and screw adjustments, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand this 23d day of May, 1879.

WILLIAM F. COOK.

Witnesses:

GEO. C. SHELMERDINE,

S. J. VAN STAVOREN.