(No Model.) 2 Sheets—Sheet 1.

F. E. CLARKE.

MECHANICAL TELEPHONE.

No. 386,238. Patented July 17, 1888.

Fig. 2.

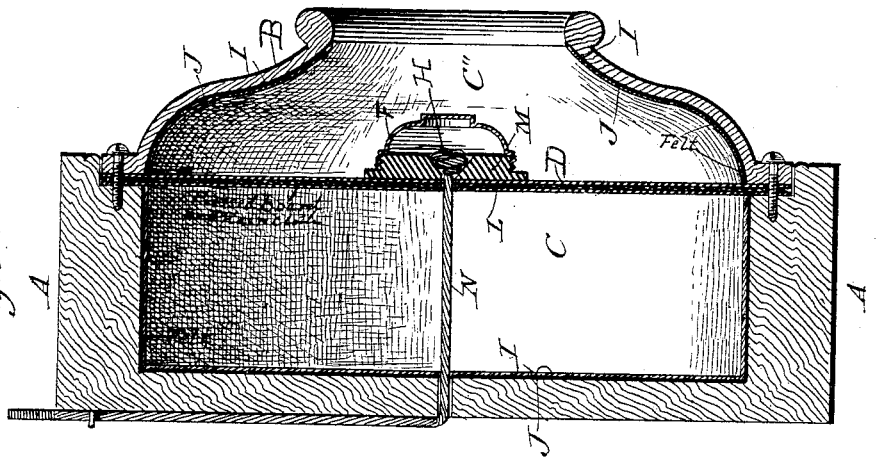
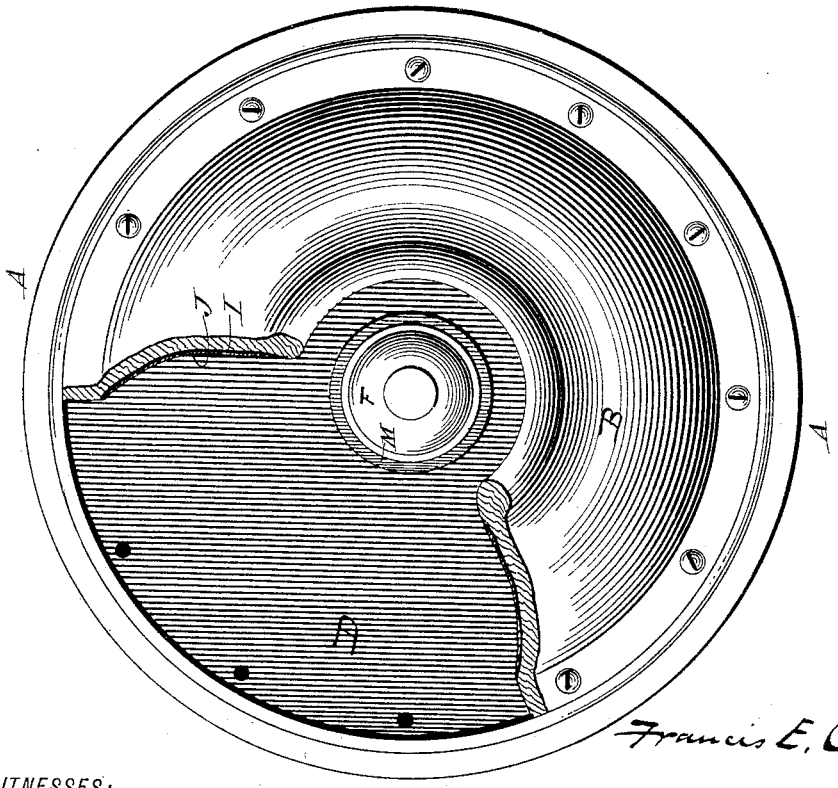


Fig. 1.



Francis E. Clarke

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ATTORNEY.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

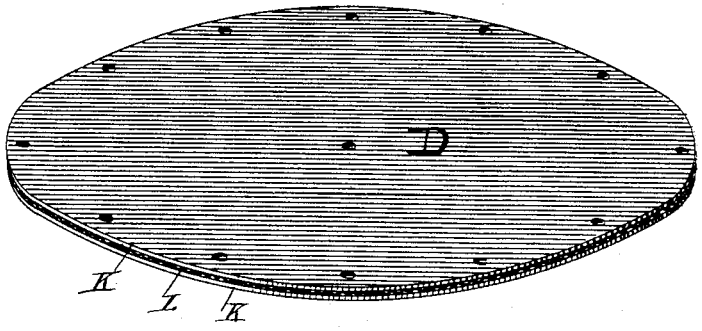
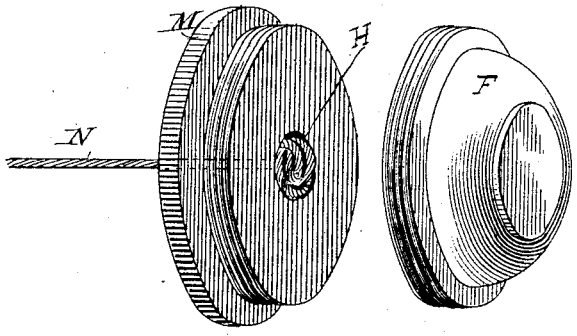


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANCIS E. CLARKE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF, BY DIRECT AND MESNE ASSIGNMENTS, TO GEORGE B. VAN BRUNT, CHARLES A. HESS, AND WILLIAM J. TOWNSEND.

MECHANICAL TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 386,238, dated July 17, 1888.

Application filed March 9, 1888. Serial No. 266,650. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS E. CLARKE, of New York city, county of New York, and State of New York, have invented certain new and useful Improvements in Acoustic Telephones, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to a new and improved acoustic telephone, and has for its object an instrument whereby sound may be mechanically transmitted a longer distance and reproduced with greater distinctness and with more perfect articulation than with any device now in use.

My device consists of a box or outer casing of any convenient form or size and preferably of wood. The box is divided into two compartments or sounding-chambers by the diaphragm. The interior walls of each chamber are coated with plumbago and the plumbago is covered with a lining of felt or woolen cloth. The diaphragm is composed of layers of pressed board with one or more layers of hair-cloth interposed and cemented with some adhesive substance and washed with asphaltum, varnish, or similar substance.

My device will more fully appear by reference to the accompanying drawings, in which—

Figure 1 is a plan view of the box or casing with a portion of the cover cut away. Fig. 2 is a sectional view of the box. Fig. 3 is a perspective view of the diaphragm. Fig. 4 is a view of the button, showing the manner of fastening the wire.

A is the outer casing of the box; B, the head or cover; C C″, the two chambers into which the box is divided; D, the diaphragm; M, the button; F, the cap over the button; N, the wire; H, the knot in which the wire terminates.

The telephone made in accordance with my device need not be of any particular shape or size; but the design shown in drawings is cheap in construction and convenient and efficient in use. In that design the sides of the box are made with a rabbet, in which the diaphragm rests, and upon which a flange of the cover or hood rests. Screws passing through the flange of the cover and the diaphragm into the box hold the parts securely in place. The chamber between the diaphragm and the hood, preferably dome-shaped, as shown, softens and renders more distinct the tone and prevents echo.

The box or casing is made preferably of wood, and is coated throughout its interior surface with a thin coating of plumbago, I, Figs. 1 and 2, or other similar substance. The effect of this is that the plumbago or similar substance furnishes a perfectly-smooth surface and tends to produce a clear, ringing, and distinct tone. I prefer the use of plumbago, rather than varnish or shellac or similar substances, on account of its cheapness.

I line the inner surface of the box or casing throughout both of its compartments with a lining of felt or other woolen material, J, Figs. 1 and 2, preferably of felt, such as felt or woolen cloth or fiber. I have found that common woolen felt does good service for this purpose.

In the construction of my telephone as described and shown I provide a chamber between the diaphragm D and the head or cover B, which I call the "receiving-chamber." One of the principal features of my invention is the felt lining in this chamber, as its principal aid is not in sending but in the reception of sound. The sound-waves pass directly from the conductor to the diaphragm, and thence into the air in the receiving-chamber C″. The felt, being a good non-conductor of sound, prevents the sound-waves from escaping from the chamber, except through the opening provided for that purpase. The value of felt as a lining to an acoustic telephone over velvet, silk, cotton, or any other woven material is found largely in the fact that it is without warp or woof and without fibers of any considerable length. By reason thereof it is a far better non-conductor of sound than any woven material or any material having fibers of greater length.

The felt lining not only prevents the loss of sound, but by reason of its peculiar construction, as described, it prevents reverberation or resonance and obviates the whizzing sound which has hitherto been found an obstacle to the practical use and economical value of the mechanical telephone.

In the construction of my diaphragm (see Fig. 3) I use two or more layers of pressed

board, K K, with an interposed layer or layers of hair-cloth, L, cemented by gelatine or some similar adhesive substance and covered upon both sides with a wash or coating of asphaltum, varnish, or other similar dressing as a protection against moisture.

The pressed board which I use is composed of leather chips and linen waste reduced to a pulp and pressed by passing between hot rollers. I prefer the use of gelatine as a cementing material, as above stated, for the reason that the gelatine, when applied to the hair-cloth in a fluid or semi-fluid form and then submitted to a pressure, permeates the hair-cloth and forms with it and the pressed board a solid mass more elastic, so as to readily receive and transmit vibrations, and tougher, so as to permit greater tension of the wire than any diaphragm now in use.

The button M, Fig. 4, may be made of any suitable material, such as vulcanized fiber. The wire N, instead of being looped to a shank passing through the button, is continuous through the button and terminates in a knot, H, whereby a greater tension upon the wire is allowed without danger of cutting the wire by the tension, and in addition thereto the vibration of sound is transmitted directly from the diaphragm to the wire.

What I claim, and desire to secure by Letters Patent, is—

1. In an acoustic or mechanical telephone, the combination of a box or casing divided by a diaphragm into two chambers, C and C″, the chamber C″, or receiving-chamber, having upon its interior surface a lining of felt with a diaphragm, substantially as and for the purposes described and shown.

2. In an acoustic or mechanical telephone, a diaphragm composed of two or more layers of pressed board with an interposed layer or layers of hair-cloth cemented by gelatine, in combination with a sounding-box and line, substantially as and for the purposes described and shown.

In testimony that I claim the foregoing I have hereunto set my hand, in the presence of two witnesses, this 3d day of March, 1888.

FRANCIS E. CLARKE.

Witnesses:

GEORGE FENN,

W. J. TOWNSEND.