(No Model.)

A. W. S. DAVIS.

MECHANICAL TELEPHONE.

No. 333,285. Patented Dec. 29, 1885.

Fig. 1.

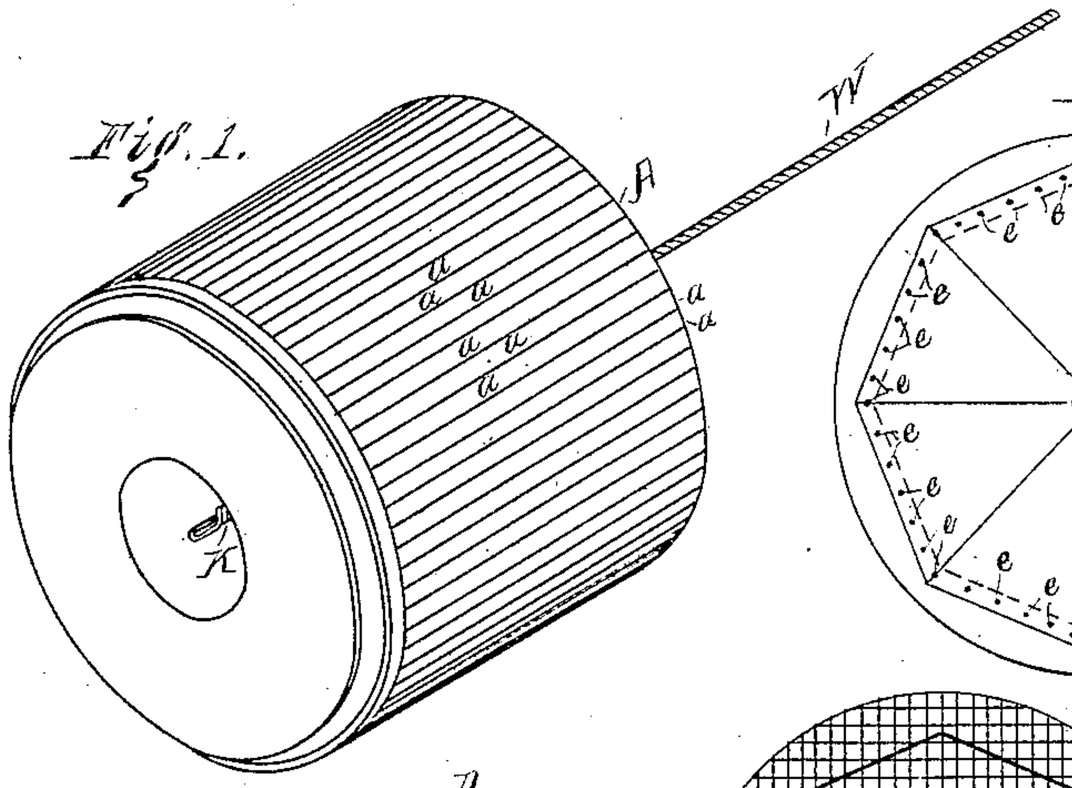


Fig. 3.

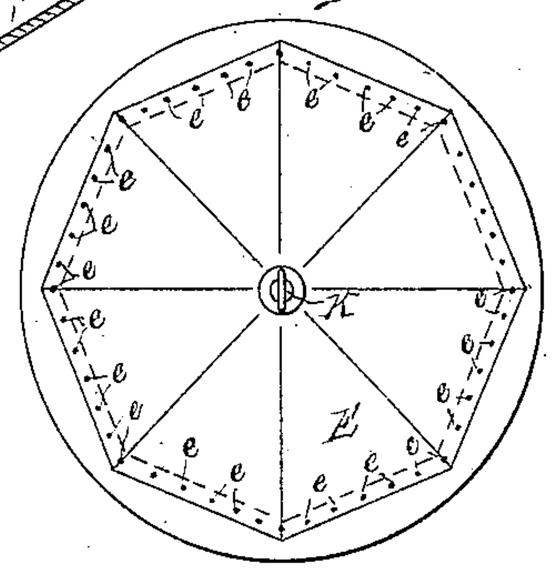
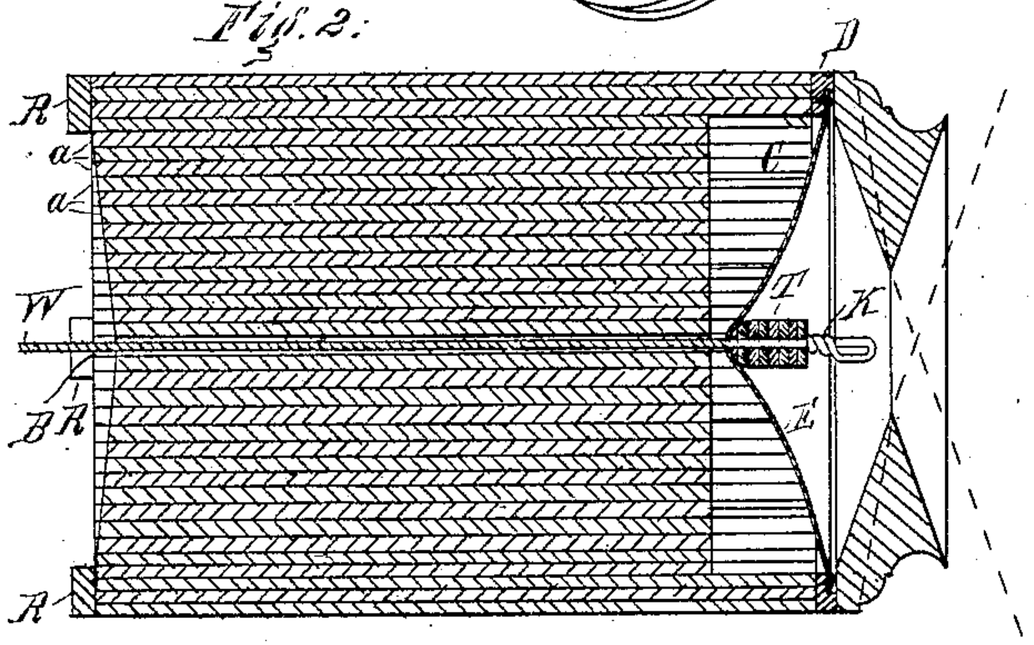


Fig. 2.



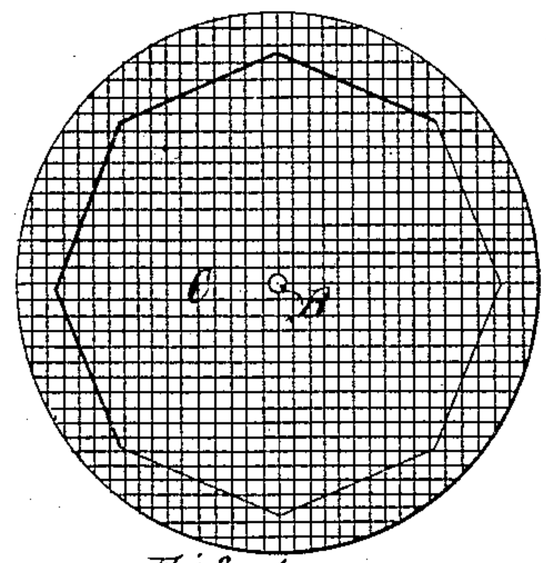


Fig. 4.

Fig. 5.

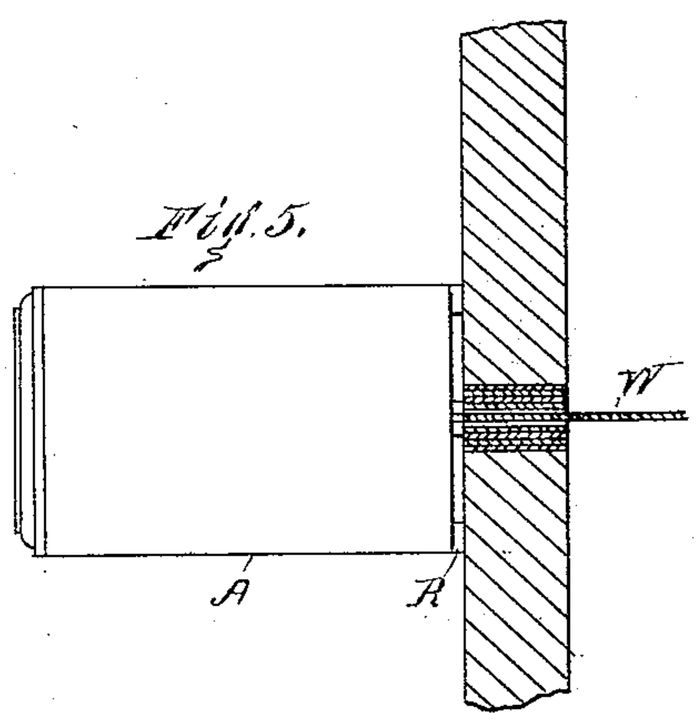
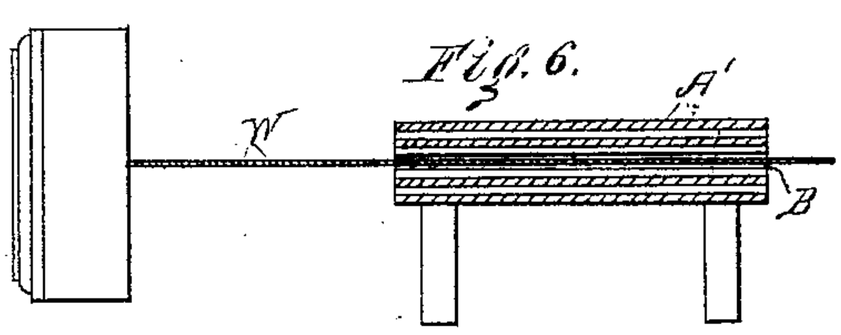


Fig. 6.



Witnesses—

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Inventor—

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By Albert M. Moore,
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UNITED STATES PATENT OFFICE.

ARTHUR W. S. DAVIS, OF LOWELL, MASSACHUSETTS, ASSIGNOR TO FREDERICK TAYLOR, OF SAME PLACE.

MECHANICAL TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 333,285, dated December 29, 1885.

Application filed October 18, 1884. Serial No. 145,830. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR W. S. DAVIS, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a new and useful Improvement in Mechanical Telephones, of which the following is a specification.

My invention relates to mechanical telephones; and it consists in an improved construction of the same adapted to increase the volume of sound and the distinctness of articulation, and in the devices and combinations hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an isometric view of a mechanical telephone constructed according to my invention; Fig. 2, a central longitudinal section of the same; Fig. 3, a front elevation of the diaphragm secured to the base-block, the mouth-piece being removed; Fig. 4, a front elevation of the base-block detached; Fig. 5, a side elevation of such a telephone attached to a wall of a building or room, the wall being in cross-section and having a compound plug or sound-modifier (also in section) surrounding the transmitting-wire where said wire passes through said wall; Fig. 6, a side elevation of such a telephone and its conducting-wire, said wire passing through a similar sound-modifier (shown in longitudinal section) supported upon posts or brackets.

The base-block or body A of the telephone is formed of a large number of small sticks, *a*, of wood, preferably maple, each of square or such other cross-section as will allow the sticks to be placed close together in a bundle without spaces between them, the grain of the wood running lengthwise of the sticks, and the sticks being glued together side by side without interstices. Such a bundle or block of sticks, made in a shape approximating its final shape, is then turned true or otherwise wrought to a symmetrical form—for instance, that of a cylinder—as shown, and a hole, B, is bored through the center thereof, longitudinally, just large enough to allow the transmitting-wire W to pass through without touching.

I have found that the conducting-power of the telephone is greatly increased and the metallic sound commonly heard in acoustic or mechanical telephones is greatly diminished by forming the body, as described, of pieces of wood thus united. The wire W is preferably insulated or wound copper wire. The front end of the body A is provided with a many-sided (preferably octagonal) sound-chamber, C, concentric with said body, the bottom or deepest part of said chamber being flat and at right angles to the longitudinal axis of said body. The front end of the body A is covered from the chamber outward with a ring or strip, D, of lead or similar insonorous material, which strip has a reduced thickness for a slight distance outward from its inner edge. Over the mouth of the chamber C is laid a diaphragm, E, of skin or other porous flexible sheet material, which diaphragm is applied to the thin part of the lead strip D, and first fastened at the angles or corners of the chamber by small nails or tacks *e*, driven through the diaphragm, through the thin part of the strip D, and into the end of the body A, as shown. The object of the strip D is to diminish the metallic or ringing sound of the telephone and render the articulation more distinct, and to prevent the vibrations from passing into the base-block. The diaphragm is then stretched by weight suspended from its center while the diaphragm is held in a horizontal position, and while so stretched from the angles of the chamber to the center of the diaphragm is tacked in straight lines from angle to angle through the strip D without additional stretching between the angles. By thus attaching the diaphragm to the strip D and the block A its greatest tension is along the radial lines which pass to the angles of the chamber. I have obtained better results as to the quantity and quality of the tone, with the chamber and diaphragm shaped as above described than with a circular chamber and a circular diaphragm, and I also find that the articulation is improved by the lines of unequal tension in the diaphragm, and that these lines are best arranged radially, and that an advantage is gained by the tension lines even when a cylindrical sound-chamber is used. The diaphragm, after drying, is rubbed with powdered rosin to fill the pores thereof, and then varnished with shellac to prevent its vi-

bratory qualties being affected by the absorption of moisture from the atmosphere. The end of the transmitting-wire is passed through the center of the diaphragm and through one or more washers, T, of leather and knotted. The knot K is made by looping the wire and winding the end of the wire around the same two or three times. Into the loop thus formed may be hooked the wire of another telephone, if desired. The front end of the loop should project about half-way through the mouth-piece F.

The action of the telephone will be improved by placing powdered rosin between the washers and between the inner washer and the diaphragm and by filling the pores of the same with rosin. In front of the diaphragm (but not in contact therewith) against the strip D is placed a mouth-piece, F, preferably of wood, the same being a ring which has an opening which flares outwardly before and behind equally from the middle of the ring. The inner bevel of the ring makes about the same angle with the plane of the ring or strip of lead D that the diaphragm makes with said plane. The angle which the bevels of the opening make with each other is about forty degrees, and the diameter of the opening in the mouth-piece, at the middle thereof, is about one-third of the diameter of the diaphragm. The shape of the mouth-piece allows the sound-waves from any part of the diaphragm to go out through the mouth-piece without striking against the outer bevel of said mouth-piece, as shown by dotted lines in Fig. 2.

I have found that the clearness of articulation of the telephone is increased by carrying the transmitting-wire through a central longitudinal orifice, B, in a sound-modifier, A′, compounded of a bundle of sticks shaped and united together just as the sticks which form the base-block A are shaped and united wherever said wire passes through the wall of a room or building, and I also use such a compound plug or sound-modifier back of the telephone, as shown in Fig. 6, whenever it may be necessary to deaden the metallic or ringing sound thereof. In all cases the modifier should be supported just out of contact with the transmitting-wire and the central orifice in said modifier should be just large enough to allow of this. The base-block A is insulated from the wall or other object by which it is supported by blocks of rubber R, or by a ring of rubber or other similar elastic material, to prevent the vibrations from passing into such object.

I claim as my invention—

1. A diaphragm for an acoustic telephone, consisting of a sheet of flexible porous material having its pores filled with rosin, as and for the purpose specified.

2. An acoustic telephone having a body or base-block formed of strips or pieces of wood arranged with their grain parallel to the transmitting-wire and united to each other laterally, as and for the purpose specified.

3. The combination of a diaphragm and a series of leather washers placed in front of said diaphragm, the spaces between said washers being filled with rosin, and the transmitting-wire passed through said diaphragm and washers and looped or knotted in front of the same, as and for the purpose specified.

4. In an acoustic or mechanical telephone, the combination of the base-block having a sound-chamber in its front end, a strip or piece of sheet-lead or similar insonorous metal covering the front end of said base-block, around said chamber, and having a reduced thickness for a slight distance outward from the inner edge of said strip, and the diaphragm secured, as herein described, over the thin part of said strip, as and for the purpose specified.

5. The combination, in an acoustic or mechanical telephone, of a diaphragm concaved on its front face and a mouth-piece placed in front of said diaphragm, said mouth-piece having a circular orifice flaring outwardly from the middle thereof equally in both directions, said diaphragm forming the same angle with the plane of its attaching edges as the inner bevel of said mouth-piece forms with said plane, as and for the purpose specified.

ARTHUR W. S. DAVIS.

Witnesses:
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