O. D. ORVIS.

Sound Articulator.

No. 227,644. Patented May 18, 1880.

Fig. 1.

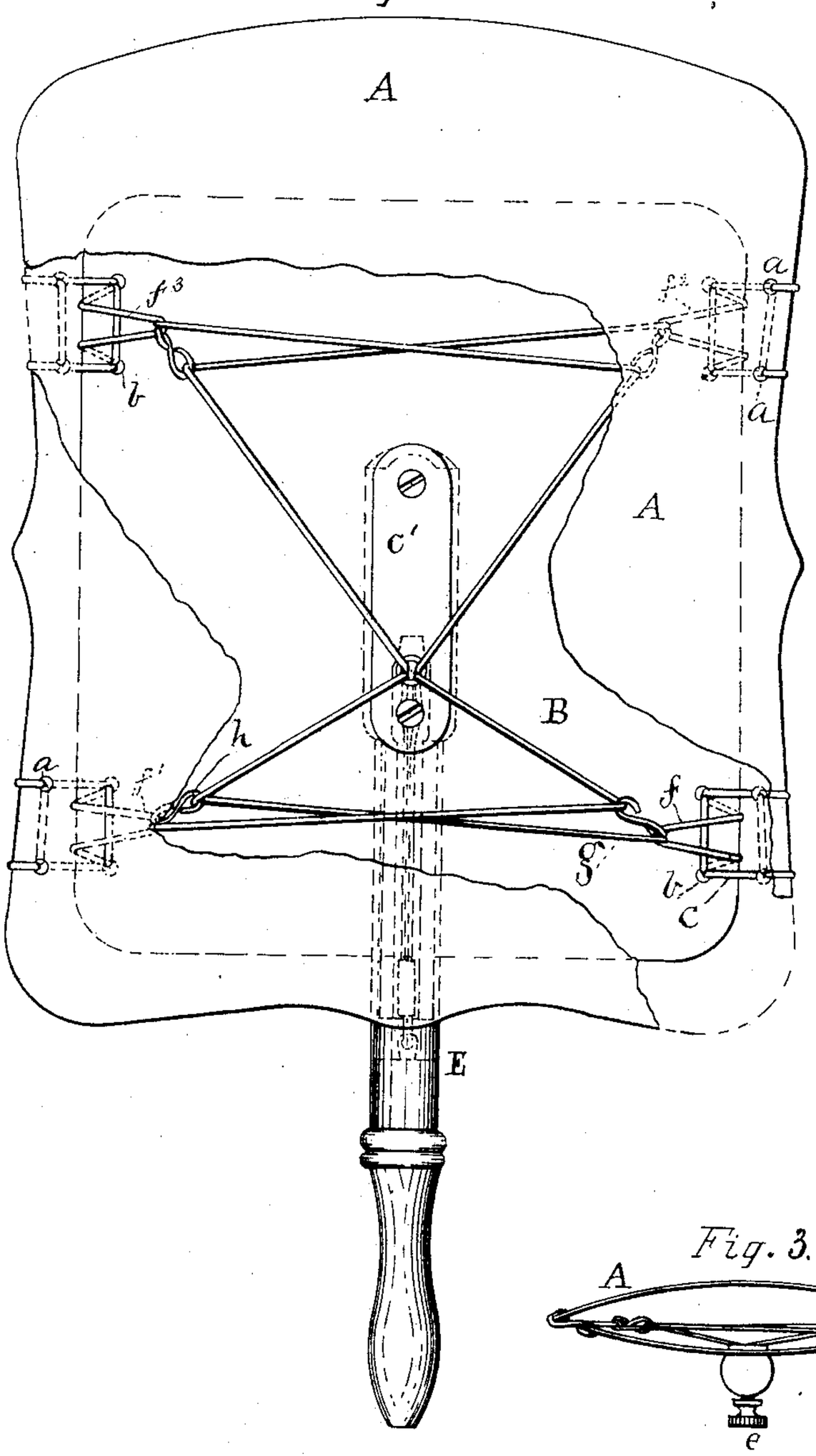

Fig. 2.

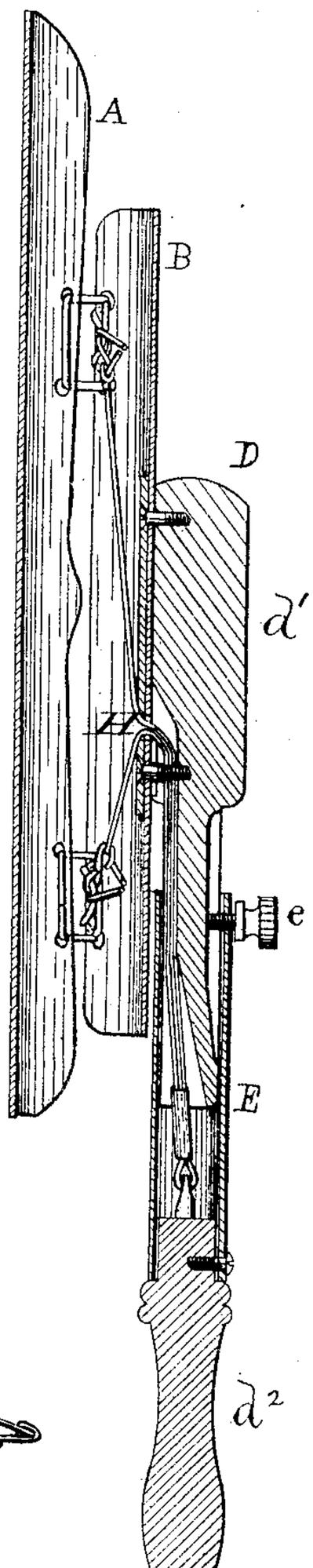

Fig. 3.

WITNESSES

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SOUND-ARTICULATOR.

SPECIFICATION forming part of Letters Patent No. 227,644, dated May 18, 1880.

Application filed January 7, 1880.

To all whom it may concern:

Be it known that I, OREL D. ORVIS, of Chicago, in the county of Cook, State of Illinois, have invented a certain new and useful Improvement in Sound-Articulators, of which the following is a specification.

This invention relates to devices for communicating sound to the auditory or acoustic nerves through the medium of the teeth or bones and tissues of the face.

Heretofore devices for this purpose have been constructed of sensitive plates of thin sheets of vulcanized or hard rubber, or of metal, to one edge of which is rigidly secured a strengthening plate or strip and a handle, said plate being given the required curve from end to end, and consequently tension, to cause it to vibrate by pressing the opposite edge from the handle against the teeth, or by tightening a cord extending from said edge to or near the handle.

In order to remove objections arising from the above class of devices in consequence of the rigidity given the vibrating plate by its handle, and in consequence of the curvature of the plate from end to end, rendering said plate non-sensitive to sound-waves coming from the sides of the plate, I have suspended my plate by wires, as hereinafter described, and curved it from side to side, the object of which is to provide a sound-articulator with a plate sensitive to sound coming from any direction and free to vibrate over its entire surface.

A further object is to provide said device with an auxiliary sensitive plate which will receive from or conduct vibrations to the main plate in such a manner that said vibrations will have their force augmented before they are communicated to the auditory or acoustic nerves, whereby the latter will impart sound to the subject with increased volume.

To this end my invention consists in suspending the sensitive plate by cords or wires, and in certain other details of construction which will hereinafter be fully described and claimed.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a front view of my device with a portion of the suspended sensitive plate broken away to show the arrangement of the suspending and tightening wires or cords. Fig. 2 is a longitudinal section through the plates and handle, showing the attachment of the cords to the latter and the position of all the parts when the plates are under tension and secured for operation. Fig. 3 is an end view, showing the relative position of the sensitive plates to each other when in use.

A represents a sensitive plate consisting of a thin sheet of vulcanized or hard rubber, or of metal, or any other material which will, when under strain or tension, vibrate when brought in contact with sound-waves, said plate being provided near its side edges with a series of perforations, *a*. B is a similar but smaller plate, provided with corresponding perforations *b*, and connected to the plate A by passing the two ends of a piece of fine wire or cord, *c*, through the perforations *b* from the rear side of the plate B, thence over the edges of plate A down through the corresponding perforation *a* from the outer face of said plate, and securing them to the same by any suitable means. By attaching the plates together in this manner the plate A is prevented from coming in actual contact with the plate B, so that when strained the former is substantially free to vibrate throughout its entire surface, and the latter made an auxiliary to the same in not only receiving and imparting the vibrations, but augmenting the force of them, as more fully hereinafter explained.

To the back of the plate B is rigidly secured, by means of screws passing through a strengthening-plate, c', from the inner side, a handle, D, made in two parts, d' d^2, to the latter of which is rigidly secured a sleeve, E, sliding upon the former and held in the desired position by means of a set-screw, *e*, whereby the handle may be lengthened or shortened at will to manipulate tension-cords, which I will now proceed to describe.

To each set of perforations in the plate B are secured loops $f f' f^2 f^3$, as indicated in Fig. 1. Secured at one end of the loop *f* is a cord, *g*, passing through an eye, *h*, in the loop f', and thence through a perforation, H, in the plate B, and then secured to part d^2 of the

handle D. In like manner a series of cords are secured to each one of the loops and pass through their respective eyes to the handle, a detail description of which is unnecessary in view of the above description. As these cords are taut when the plates are not strained it will be seen that if the handle be lengthened the side edge of plate B, together with the respective edges of the plate A, will be drawn toward their longitudinal centers, curving them in opposite directions to each other, and consequently straining them, as shown in Figs. 2 and 3.

By straining the plates they are both made sensitive to sound-waves and caused to vibrate. By curving them in opposite directions the vibrations received by one will be transmitted to and augmented by the other, and by reason of these curvatures and their close proximity to each other they are made sensitive to sound-waves upon their edges as well as faces, and hence from every direction.

The plate B is made smaller than A, so that it will rest upon the cords or wires connecting said plates, but of sufficient size to be sensitive in the same respect as plate A.

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

1. The combination, with the vibrating plate A, of the auxiliary vibrating plate B, said plates being connected by wires or cords, substantially as described, and curving in opposite directions, whereby the vibrations of one of said plates are imparted to the other, and the force of the vibrations thereby augmented.

2. The combination, with the plates A and B, of the sleeve E, handle d' d^2, and devices for retaining them in position to adjust the tension of the vibrating plates, as described and shown.

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