

No. 652,202.

Patented June 19, 1900.

L. H. VICKERS.  
ARTIFICIAL EAR DRUM.  
(Application filed Jan. 11, 1900.)

(No Model.)

Fig. 1.

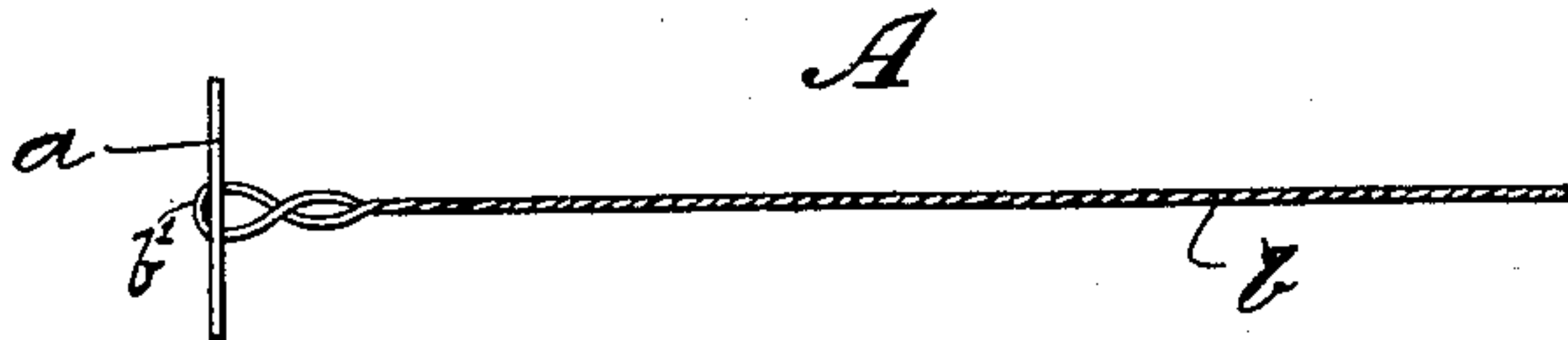


Fig. 2.

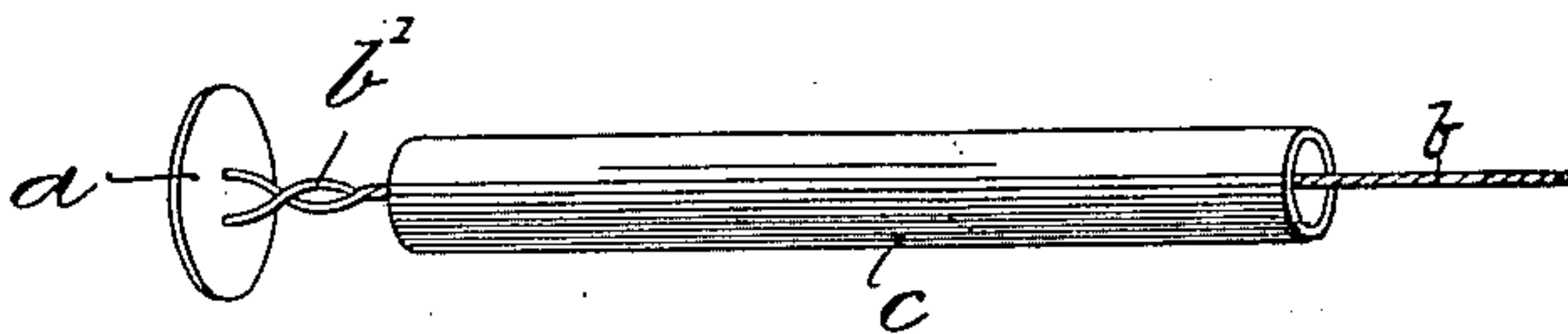
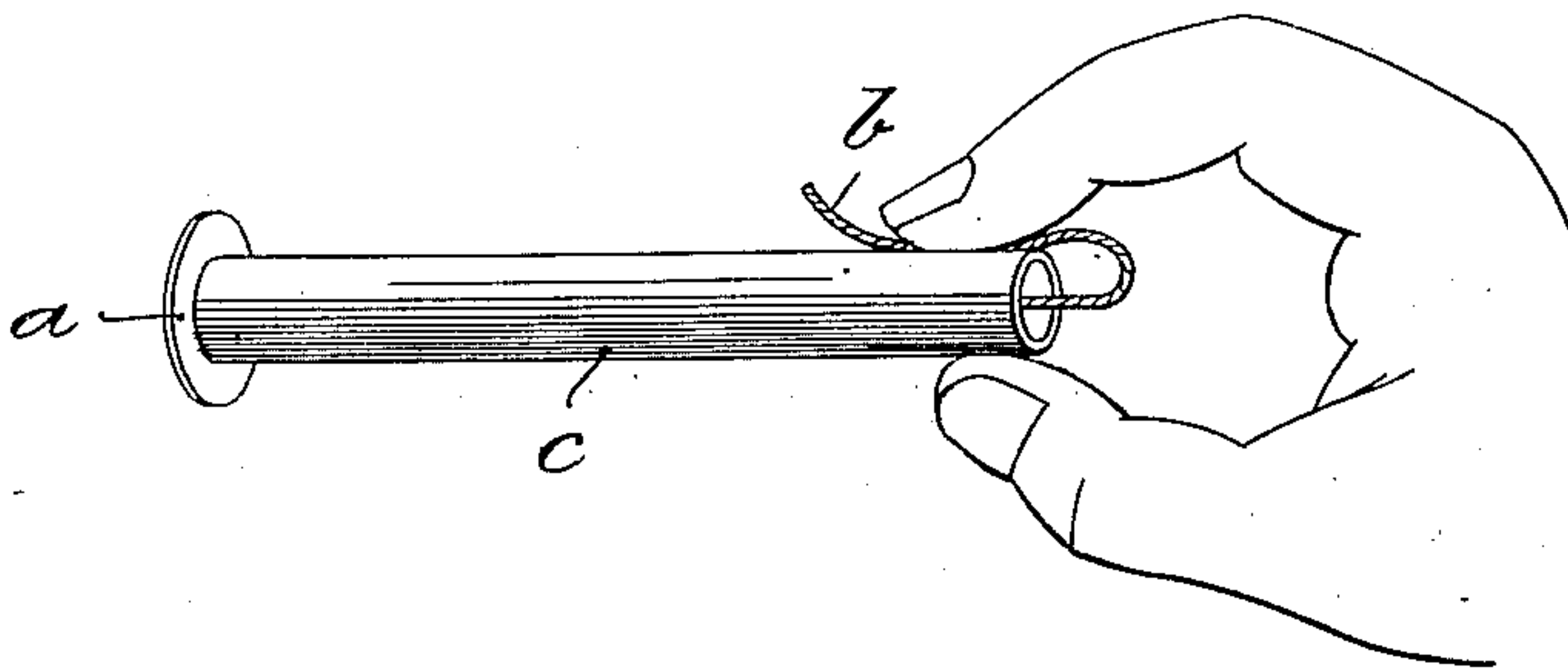


Fig. 3.



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# UNITED STATES PATENT OFFICE.

LAURA H. VICKERS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO  
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## ARTIFICIAL EAR-DRUM.

SPECIFICATION forming part of Letters Patent No. 652,202, dated June 19, 1900.

Application filed January 11, 1900. Serial No. 1,102. (No model.)

To all whom it may concern:

Be it known that I, LAURA H. VICKERS, a citizen of the United States, residing at No. 1511 North Fifty-fifth street, Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Artificial Ear-Drums, of which the following is a specification.

My invention has relation to an artificial ear-drum for the use of persons with defective hearing, and adapted to be inserted into the *meatus externus* and so as to be brought in perfect or uniform contact with the *membrana tympani* without pain, irritation, or danger thereto; and in such connection my invention relates more particularly to the construction and arrangement of such a device for the said purpose.

The principal objects of my invention are, first, to provide an artificial ear-drum of simple and effective construction and arrangement for use of persons with defective hearing, and which device is durable and inexpensive, and in which the same can be inserted into the ear without the use of forceps or wires, which others employ, and which are not only dangerous in inexperienced hands, but do not insure proper insertion of the artificial drum; second, to provide an artificial ear-drum in which tubes, plugs, loops, springs, or molded bodies made integral therewith are obviated, which others employ, and which are not only uncomfortable and useless as a means of conducting sound-waves, but also deaden the vibrating qualities of the drum, strain the walls of the *meatus externus*, and decrease the size of the channel through which nature intended the sound-waves should pass, and which also must be unobstructed to insure the sound-waves reaching either the artificial or natural drum; third, to provide an artificial drum in which is obviated the use of rubber as a material for the formation of the drum, which others use, and which not only decomposes rapidly under the influence of heat, perspiration, and cerumen of the ear, but draws and inflames the delicate membranes of the *meatus externus*, as is the case with a rubber article which is worn constantly in close contact with the body; fourth, to provide an artificial ear-drum in which the same is adapted

to be inserted by the use of a small flexible tube smaller than the natural channel of the *meatus externus* and carrying the drum or disk in a smooth and even condition into perfect contact with the natural drum or *membrana tympani* without pain, force, irritation, or danger, whereby its retention is insured, the tube being removable, as well as all obstruction to sound-waves, which is not the case with others employed having tubes, plugs, loops, springs, and provided with bodies molded or made integral therewith for the purpose of inserting and retaining the drum or disk calculated to deaden and decrease the power of vibration, as well as decrease the size of the natural channel; fifth, to provide an artificial ear-drum in which the same is as soft as the parts with which it comes in contact, which is not the case with most of the other artificial ear-drums employing metal wires, plugs, or wads of rubber, and, sixth, to provide an artificial ear-drum in which the sound-conducting powers of the drum or disk are increased by forming a connection with a fine insulated silk thread doubled or looped through the disk and then made into one at the external end, the doubled or looped end of the thread being exposed at the opening of the external ear and adapted to conduct the sound-waves into the *meatus externus* and the loop of the thread made in front of the artificial drum forming a circuit through the artificial drum or disk in contact with the natural drum for conveying the sound-waves in greater force or volume to the artificial drum, and by the latter's intensified vibrations these sound-waves are conveyed in increased volume across the natural drum and conducted to the auditory nerves, thereby providing what be termed a "means of telephony to the internal ear," the soft drum acting as a diaphragm and the insulated and specially-prepared silk acting as a wire or means of conveying the sound-waves to the diaphragm and by the diaphragm to the auditory nerves of the ear.

My invention, stated in general terms, consists of an artificial ear-drum when constructed and arranged in substantially the manner hereinafter described and claimed.

The nature, scope, and objects of my present invention will be more fully understood



from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a side elevational view of an artificial ear-drum embodying the features of my invention. Fig. 2 is a perspective view, showing the insulated silk thread or cord surrounded by a flexible tube embodying one of the features of my invention, and for inserting the disk or drum, with its thread or cord, into the *meatus externus* and so as to be brought into contact with the *membrana tympani* without pain, irritation, or danger to the natural drum; and Fig. 3 is a similar view of the complete device ready for insertion into the ear, showing the manner in which the same is introduced through the *meatus externus* into contact with the *membrana tympani* of the ear.

Referring to the drawings, A is the artificial drum, consisting of a disk *a*, preferably composed of a very fine silk fabric treated in boiled oil and made smooth, elastic, and flexible.

*b* is a silk thread looped through the disk *a*, as at *b'*, and then doubled or twisted. This thread is afterward immersed in a boiling bath of preferably pure white beeswax and afterward in a bath of boiling water, so that the same may become impervious to moisture and also be convenient to handle or use and also to maintain a certain degree of stiffness necessary to keep the end exposed in the direction of the external ear.

*c* is the flexible inserting-tube, preferably consisting of a woven linen fabric, which after being formed into a tube is immersed in a suitable molten or liquid mass to become saturated therewith, and which tube is then introduced for a limited time into a suitable furnace, so that the solution applied to the woven linen fabric constituting the base of the tube may become vulcanized thereto to give the requisite degree of flexibility, as well as elasticity, to the same for permitting of the inserting of the disk, with its silk thread or cord, when arranged in the manner illustrated in Fig. 3, into and through the *meatus externus* and so that this disk *a* may be brought in uniform contact with the *membrana tympani* without pain, irritation, or

danger to the person. After the disk has been seated in the position required in contact with the *membrana tympani* the flexible tube *c* may be then withdrawn from its contact with the rear face of the disk *a* and also of the cord or thread *b*, and the cord or thread may then be cut off a sufficient distance in the ear so as not to protrude while the artificial disk *a* is in contact with the natural drum, yet at the same time a sufficient length of the cord or thread *b* is retained to permit of the withdrawal of the disk when required.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. As a new article of manufacture, an artificial ear-drum consisting of a smooth, elastic and pliable disk, and a silk thread looped through the disk and then twisted or doubled upon itself, said thread being properly insulated, rendered impervious to moisture and stiffened, substantially as and for the purposes described.

2. As a new article of manufacture, an ear-drum, consisting of a treated silk fabric made smooth, elastic and flexible, a silk connection, consisting of a thread properly insulated and made impervious to moisture and given a certain degree of stiffness, and a flexible inserting-tube, composed of a woven linen fabric coated with a suitable material to become pliable or flexible, substantially as and for the purposes described.

3. As a new article of manufacture, a disk composed of a treated silk fabric made smooth, elastic and pliable, a silk connection, consisting of an insulated thread or cord made impervious to moisture and given a certain degree of stiffness, and a flexible inserting-tube composed of a coated and vulcanized woven linen fabric and said tube adapted to be brought into contact with one face of said disk and removably surrounding said insulated cord or thread, substantially as and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

LAURA H. VICKERS.

Witnesses:

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