

No. 724,435.

PATENTED APR. 7, 1903.

G. K. CHENEY.

SOUND BOX FOR SOUND RECORDING AND REPRODUCING MACHINES.

APPLICATION FILED APR. 16, 1902.

NO MODEL.

Fig. 5.

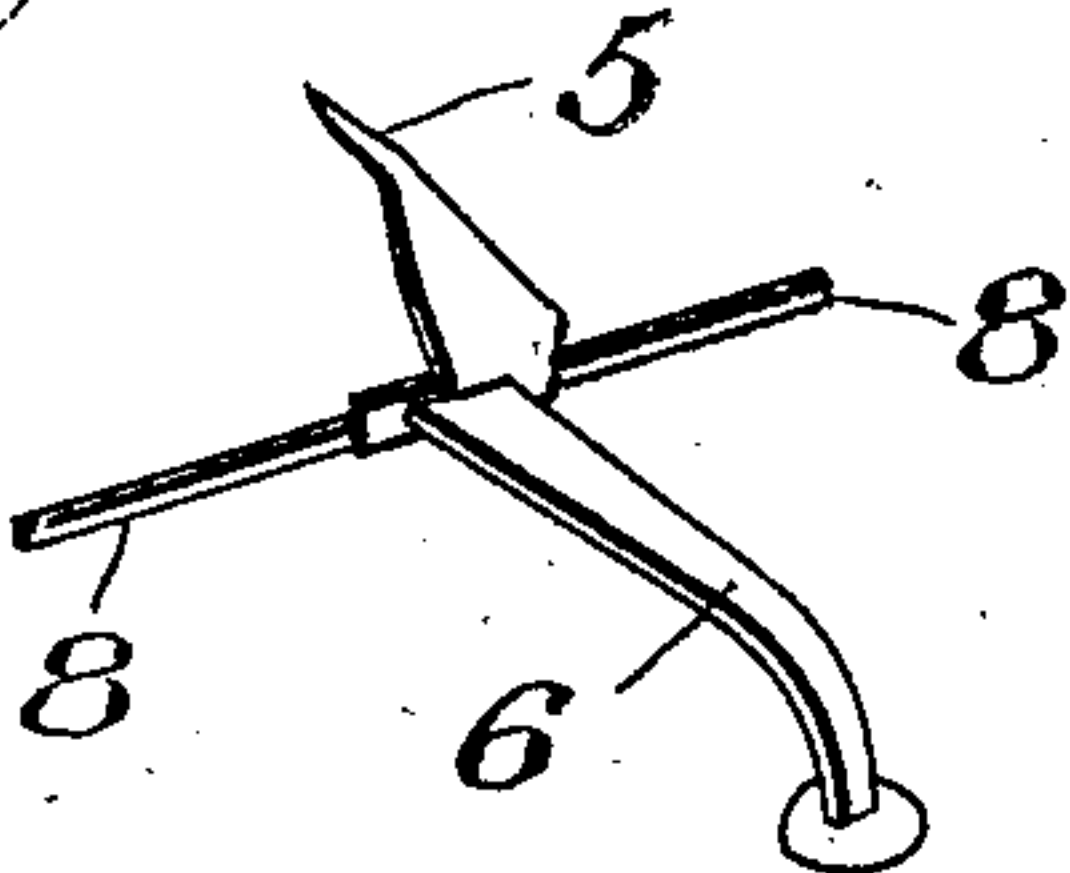


Fig. 6.

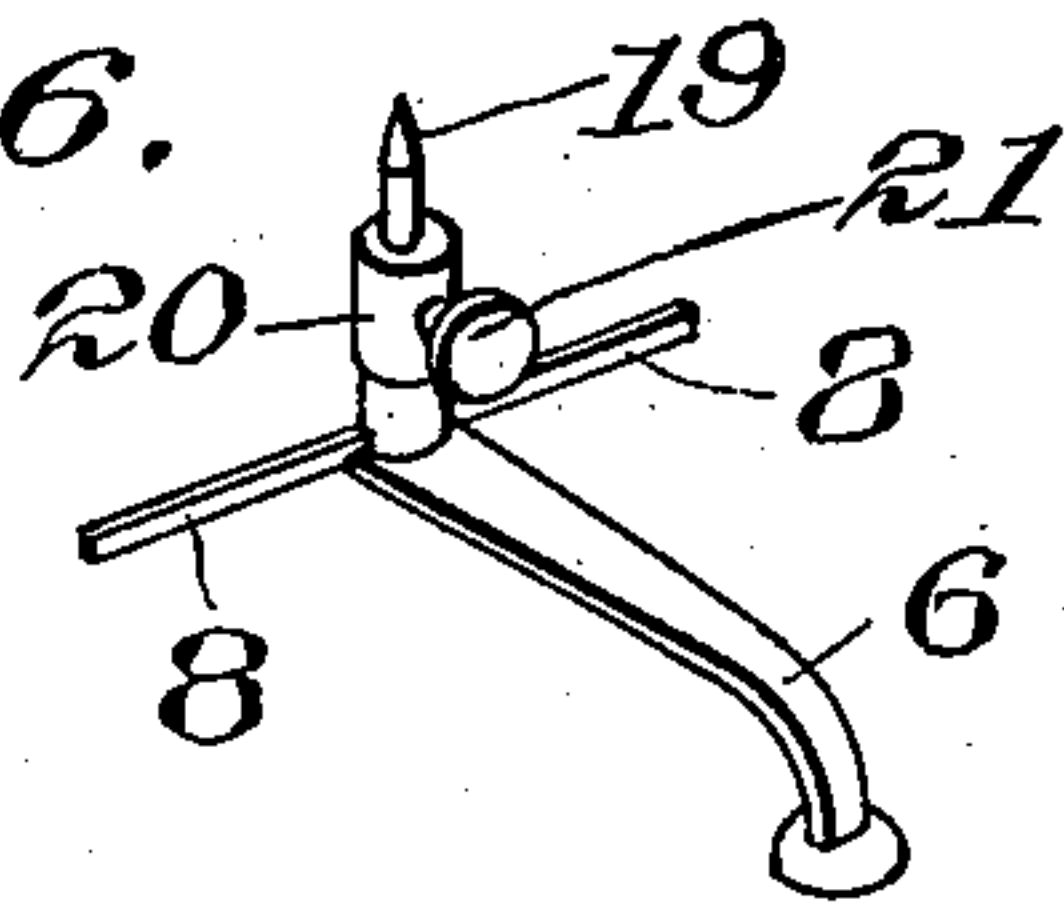


Fig. 4.

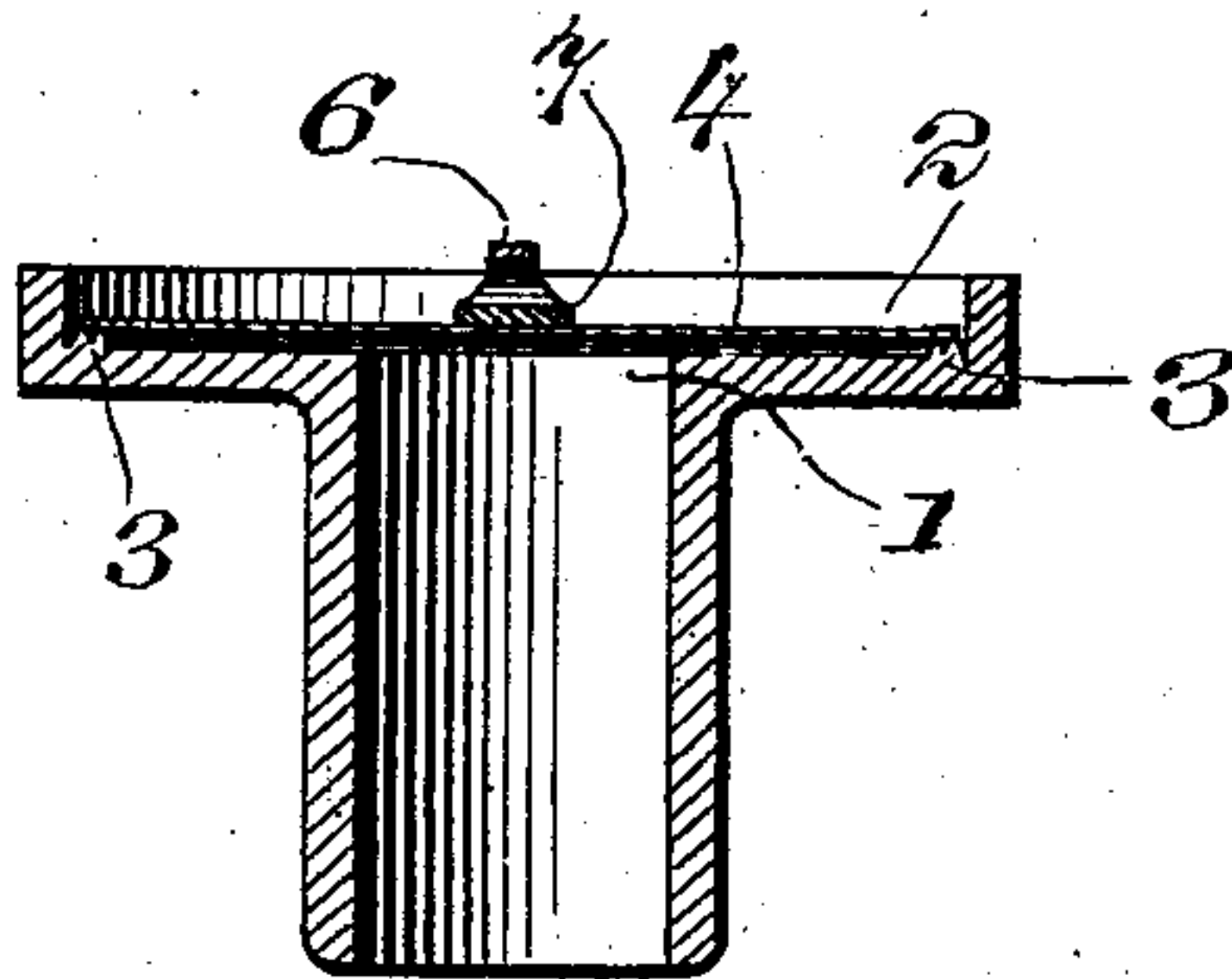


Fig. 3.

Fig. 1.

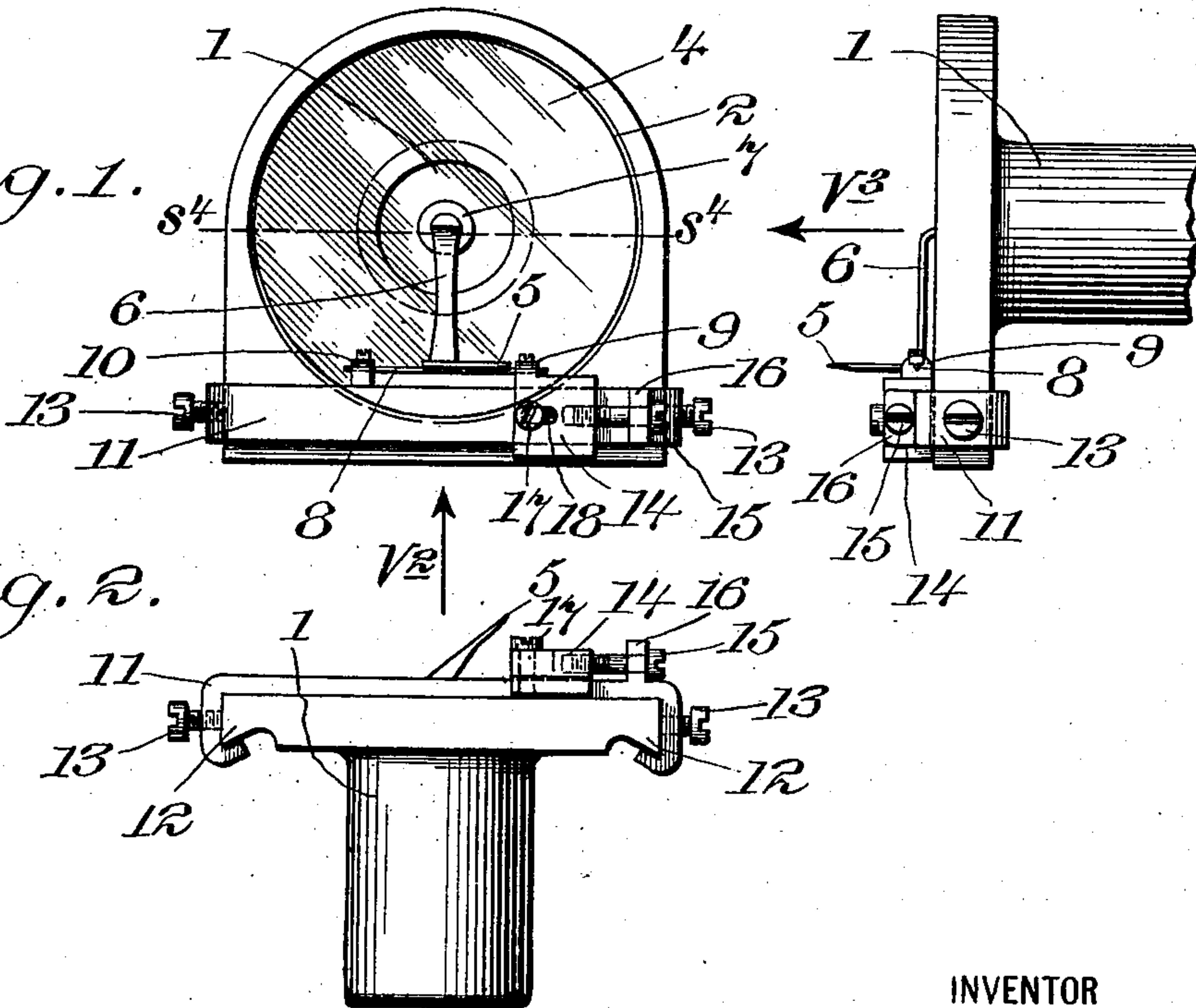
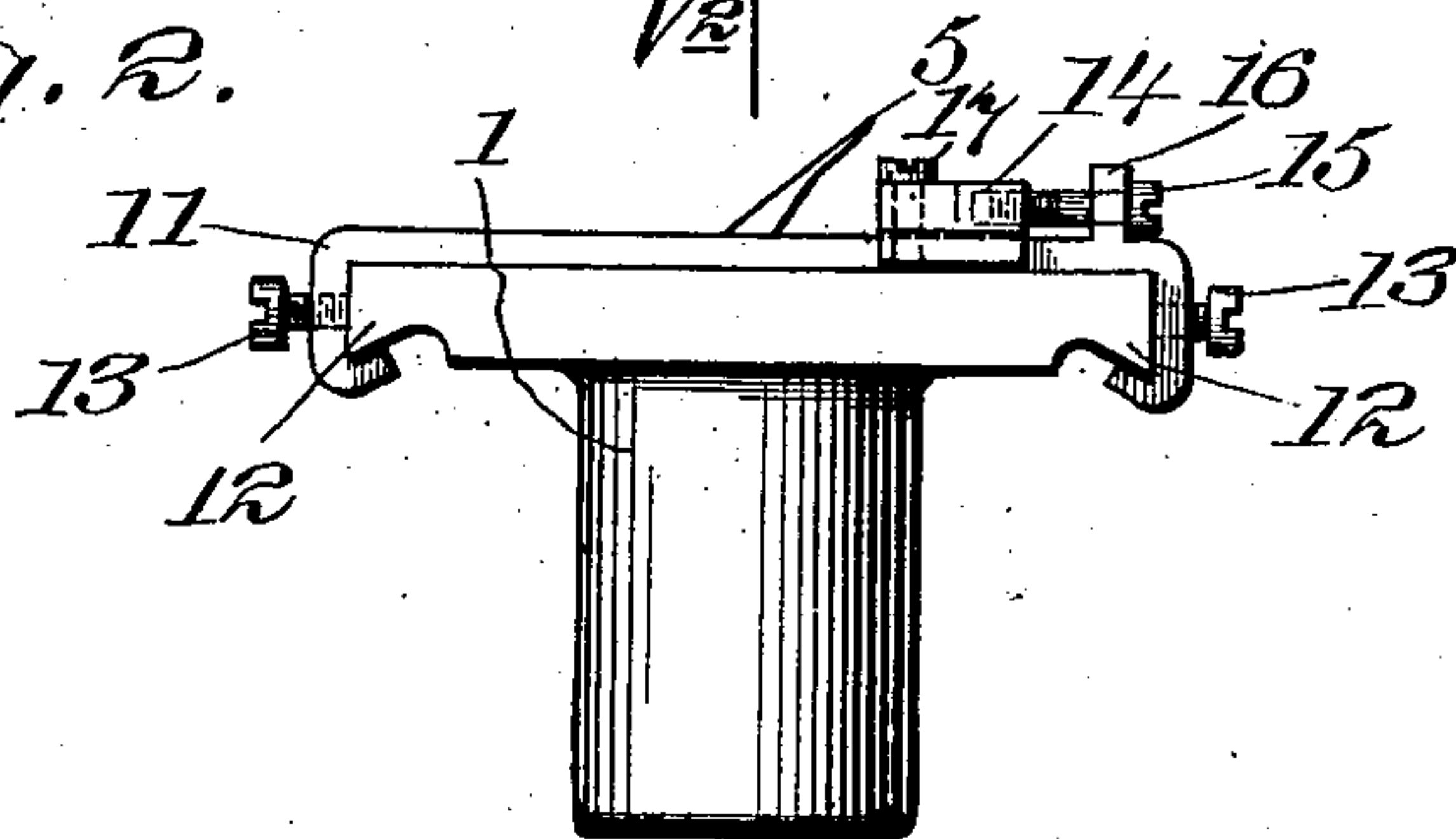


Fig. 2.



WITNESSES:

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GEORGE K. CHENEY, OF NEW YORK, N. Y.

SOUND-BOX FOR SOUND RECORDING AND REPRODUCING MACHINES.

SPECIFICATION forming part of Letters Patent No. 724,435, dated April 7, 1903.

Application filed April 16, 1902. Serial No. 103,153. (No model.)

To all whom it may concern:

Be it known that I, GEORGE K. CHENEY, a citizen of the United States of America, and a resident of the city of New York, county of New York, State of New York, have invented certain new and useful Improvements in Sound-Boxes for Sound Recording and Reproducing Machines, of which the following is a specification.

My invention relates to sound recording and reproducing machines, and more specifically to certain improvements in the construction of the sound-box employed therein.

One embodiment of the invention is illustrated in the accompanying sheet of drawings, throughout the several views of which like reference-numerals indicate corresponding parts.

In the drawings, Figure 1 is a plan view of the lower side of the sound-box. Fig. 2 is a side elevation thereof as viewed in the direction indicated by the arrow V². Fig. 3 is a similar view looking in the direction indicated by the arrow V³. Fig. 4 is a central vertical sectional view taken on the lines s⁴s⁴ of Fig. 1. Fig. 5 is a detail view in perspective of the recording-point and its supporting-arm, and Fig. 6 is a similar view of an interchangeable reproducing-stylus.

Referring to the drawings, the sound-box casing is represented as provided in the usual manner with a tubular extension 1 for connection with the horn and a chamber 2 for the diaphragm. On the bottom of this chamber an annular seat 3 is formed, to which the diaphragm 4 is adhesively secured by wax or other suitable material. The seat may be formed by a single head having a concaved face or by two heads concentrically arranged side by side. In either case a retaining-groove is provided for an annulus of wax, on which the diaphragm is placed while the wax is soft and secured as it hardens.

The recording-point 5 is formed in part with or rigidly secured to approximately an L-shaped arm 6, the short member of which is waxed to a disk 7, of rubber or other elastic material, and this disk is in turn secured directly to the diaphragm, as shown in Fig. 4. The free end of the long member of the L-shaped arm is secured centrally to a wire or strip 8 of highly resilient metal, preferably

steel, which has its ends removably secured by screws in lugs 9 10 of a movable carriage 11. The carriage has two adjustments, one to regulate the tension of the arm on the diaphragm and the other to regulate the tension of the wire or strip which carries the stylus-arm. The adjustment of the carriage proper is effected by mounting the same on guides 12 12, formed in part with the sound-box casing, there being set-screws 13 13 for securing the carriage in any position to which it may be adjusted on the guides. The second adjustment is effected by mounting a block 14 upon the carriage proper and shifting it as may be required by means of a screw 15, turning freely in a lug 16. The block 14 straddles the carriage and is secured as adjusted and limited in movement by a set-screw 17, working in a slot 18. The lug 9, in which one end of the wire 8 is secured, is formed in part with the block 14, and the lug 10 is integral with the carriage. Thus it will be seen that when the block is adjusted by the screw 15 the wire may be drawn taut and tensioned as may be required and the block thereafter secured by the screw 17.

The sound-box constructed as above described may be used either in recording or reproducing sound; but owing to the form of point or stylus employed it is specially adapted as a recorder. In order to obtain good results, it is necessary in reproducing to change the needle frequently, and I therefore preferably substitute for the recording-point an ordinary straight needle or stylus 19, mounted, however, in the same manner as shown in Fig. 6, but removably secured in a socket or tubular extension 20 of the L-shaped arm by a set-screw 21.

In use either in recording or reproducing the diaphragm is practically free to vibrate throughout its entire area, and the full force and effect of the sound-waves are thereby obtained. The wax on which the diaphragm is seated serves to elastically connect the same with its seat and has more or less yielding action as the diaphragm vibrates. Thus mounted the diaphragm is rendered extremely delicate and sensitive, and as a result it responds fully to the shorter sound-waves, which aid materially in improving the tone reproduced by giving it depth, richness, and a well-

rounded quality generally. The use of an elastic medium between the stylus-arm and the diaphragm also contributes largely in improving the tone quality, as it yields on the outward vibration of the diaphragm, and thereby affords greater amplitude of movement with a corresponding increase of volume and clearness of tone on reproduction. Important advantages are secured in mounting the stylus-arm on a spring-metal wire in the manner described. The construction is extremely simple, and the readiness and facility with which the wire may be tensioned and such tension varied as desired proves both effective and satisfactory. This form of spring acts both ways and serves to yieldingly maintain the stylus and its arm in a central position. A slight shifting of the main carriage serves to complete the adjustment of the needle and regulate the pressure of the needle-arm upon the diaphragm.

The operation and adjustments will be apparent from the foregoing description.

It will be understood that I do not wish to limit myself to the exact construction and relative arrangement of parts herein illustrated and described, as various changes might be made without departing from the spirit and scope of my invention. For example, the form of the sound-box casing might be changed, also the arrangement of the diaphragm and its seat therein, without necessarily dispensing with the elastic medium employed as a yielding connection between the same. Other means for effecting the adjustment of the stylus with relation to the diaphragm and for mounting the stylus-arm might also be employed; but all such changes I consider obvious and immaterial variations of form and not of substance and still within the meaning of the present invention.

Having therefore described my invention, I claim—

1. The combination of a diaphragm, a stylus phonetically connected therewith, a spring-wire carrier for the stylus, and means for stretching the wire to vary its tension. 45

2. The combination of a diaphragm, a stylus phonetically connected therewith, a torsion-spring on which the stylus is mounted, supports for the spring and means for adjusting the supports to regulate the tension of the spring. 50

3. The combination of a diaphragm, a stylus phonetically connected therewith, a spring-wire carrier for the stylus and fastenings for the ends of the wire, one of said fastenings being adjustable to vary the tension of the wire. 55 60

4. The combination of a diaphragm, a spring-mounted stylus phonetically connected therewith, and a carrier for the stylus adjustable in a plane parallel with the face of the diaphragm. 65

5. The combination of a diaphragm, a stylus cooperating therewith, a spring-wire on which the stylus is mounted, an adjustable carrier for the wire and means on the carrier for varying the tension of the wire. 70

6. The combination of a sound-box provided interiorly with an annular seat, a diaphragm elastically secured to the seat, a stylus cooperating with the diaphragm, a spring-wire on which the stylus is mounted, an adjustable support for the wire and means for varying the tension thereof. 75

Signed at New York city, New York, this 15th day of April, 1902.

GEORGE K. CHENEY.

Witnesses:

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L. E. PEARSON.