M. KEEN.

PHONOGRAPH.

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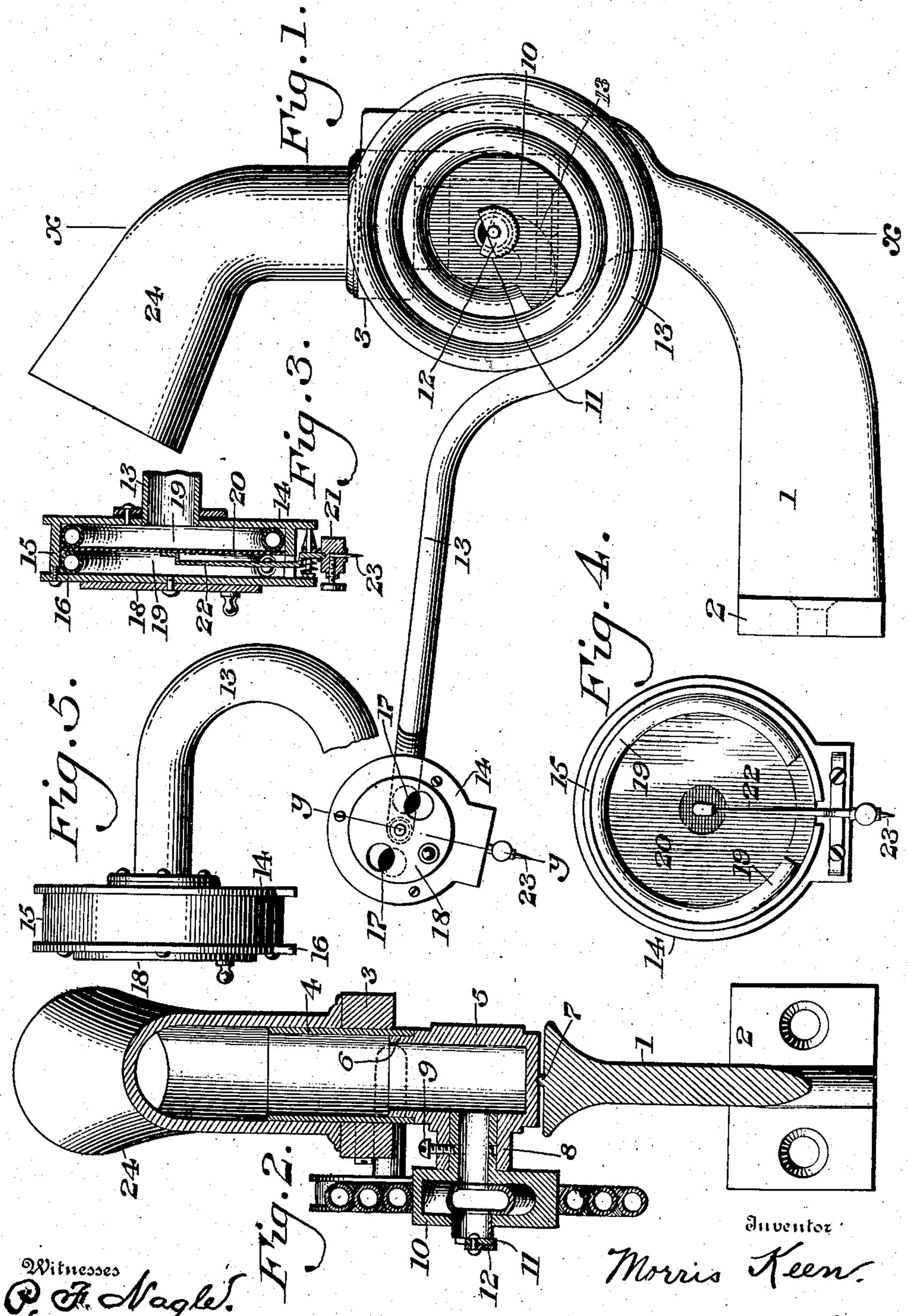
907,814.

Patented Dec. 29, 1908.



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PHONOGRAPH.

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To all whom it may concern:

Be it known that I, MORRIS KEEN, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Phonographs, of which the following is a specification.

My invention relates to phonographs and consists of an artificial extension of a portion of the sound conveyer between the reproducer and the horn support, as set forth in the claims.

It further consists in means for controllably admitting air to the side of the diaphragm opposite to the admission tube, as set forth in the claims.

It further consists of novel details of construction, all as will be hereinafter fully set forth.

Figure 1 represents a side elevation of an attachment to a phonograph, embodying my invention. Fig. 2 represents a sectional view on line *x*—*x*, Fig. 1. Fig. 3 represents a sectional view on line *y*—*y*, Fig. 1. Fig. 4 represents a side elevation of the reproducing portion with one side thereof removed. Fig. 5 represents a plan view of a portion of the device on an enlarged scale.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings: 1 designates an arm or bracket having the plate 2 thereon which may be secured to the box of the phonograph or to a suitable support. Carried by the bracket 1 is a collar 3 to which is secured the sleeve 4.

5 designates a thimble which has a portion 6 projecting into the sleeve and which is rotatable thereon, said thimble being mounted on the pivotal point 7 carried by the bracket 1 and being provided with an extension 8. Connected with the extension 8, by means of a screw 9, is a chamber 10, the same having an opening extending transversely therewith and communicated with the interior of the thimble 5. A plate 11 partly closes the outer end of the opening and a valve 12 is connected with said plate and serves to regulate or control the outlet opening, as will be hereinafter described. Communicating with the interior of the chamber 10 is a pipe 13 which at a suitable point is formed spirally, as best understood from Figs. 1 and 2, it being noted that said spirals are situated substantially adjacent each other in order to occupy as small a space as possible. While the convolutions of the tube have been shown in a spiral it will be apparent that any form may be used which will materially increase the length of the restricted path of travel of the sound waves from the origin of the same to their delivery, this being the object. Supported at the outer end of said pipe 13 is the phonograph reproducer or sound box 14. This reproducer is formed in any suitable manner and in the present instance consists of the body portion 15 to which the end of the pipe 13 is attached, in any suitable manner and has a plate 16 attached to the body portion, said plate having the openings 17 therein.

18 designates a valve which is pivotally mounted on the plate 16 and can move thereon.

The sound box, tube 13 and chamber 10 constitute a casing or passage way, closed to the outside air, except as provided for by my opening, throughout its entire length from the diaphragm or point of origin of the sound waves to the horn which I consider the point of delivery of the sound waves. I find an opening to the outside air between these points of origin and delivery quite desirable for some purposes and at the same time am able to close it when I wish to prevent communication with the outside air. The opening upon the delivery side of the diaphragm at 12 is to be distinguished from that upon the opposite side of said diaphragm at 17, the opening of which changes the space upon that side of the diaphragm from a closed and, under certain circumstances, a damping chamber to an open chamber permitting additional vibration of the diaphragm and giving an exit for the sound from that side of the diaphragm, this portion of the sound, however, not being shown as megaphoned, In so far as it permits more free vibration of the diaphragm this increases the volume of the sound from the delivery side of the diaphragm which is in this case, and usually, megaphoned.

Within the chamber are the two rubber tubes 19 between which is held the diaphragm 20.

The needle holder consists of the block 21 carried by the arm 22, the latter being pivotally mounted with respect to the body portion 15 and the diaphragm 20, the needle or stylus 23 being removably and adjustably held in said block 21.

24 designates the horn holder which is of

suitable shape and which is rotatably mounted upon the sleeve 4.

The operation of the device will be readily seen. The bracket 1 is firmly secured to the box of the phonograph or to any suitable point that may be desired, and by reason of the construction of the horn receptacle on its support it can be turned in any direction. The stylus support which consists of the pipe 13 in the present instance, can also be rotated in any direction, as will be apparent, since the same rests upon the pivot 7 and is supported by the sleeve 4 which is firmly held in the collar 3. Longitudinal movement is also permitted to the stylus in order that the same can be raised and lowered, this movement carrying with it the pipe 13 and its convolutions. When the parts are in position and the stylus is operating the sound is transmitted from the vibrator 20 through the pipe 13 and its various convolutions, finally entering the interior of the thimble 5 and being discharged through the horn holder 24 which may or may not contain a horn. By reason of this passage through this pipe 13, the sound is softened and the scratching and rasping tones which ordinarily occur in a phonograph are entirely obviated, the result being a soft and melodious tone. In order to adjust the amount of sound I have provided valve 12 controlling the opening into the thimble 5 and by adjusting this valve, more or less air from the outside is permitted to enter and be mingled with the sounds from the phonograph, the effect being that the sound from the instrument is not nearly so great and when the opening or valve is entirely closed, the sound is still softer. In addition, by adjusting the valve 18, thus opening or closing the openings 17, in the plate 16, I can still further adjust the sound from the instrument, the effect of which is evident, as it often occurs, that it is not desired to have the sound from the instrument too loud as it may be annoying. By reason of my construction I can regulate this as desired

Where I refer in my claims to a "coil" or to "coiled" tubes or other passages I wish to be understood as including within the term "coil" or "coiled" spirals within the same or approximately the same planes, helices and any plurality of return bends or loops or even a single such loop whose purpose is the lengthening of the path of travel of the sound waves or modification of the waves.

It will be evident that various changes may be made by those skilled in the art, which may come within the scope of my invention and I do not therefore desire to be limited in every instance to the exact construction herein shown and described.

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

1. In a device of the character described, a diaphragm, a horn holder, and a spirally coiled casing therebetween.

2. In a device of the character described, a needle, a reproducer suitably supported, said reproducer having an opening thereinto, a valve adjustably controlling said opening, a tube for transmitting the sound, a chamber in communication with said tube and having an opening therein and a valve controlling said opening.

3. In a device of the character described, a stylus, a diaphragm, a transmission tube and means for controllably admitting air to the side of the diaphragm opposite to the admission tube in quantity as desired.

4. In a device of the character described, a diaphragm, a horn holder and a coiled casing between the diaphragm and the horn holder to increase the distance traversed by the sound between these two points.

5. A talking machine comprising a reproducer, a fixed horn support, and a sound conveyer mounted upon said support, a portion of said sound conveyer extending from said reproducer toward said support, and another portion of said sound conveyer being rigid and artificially lengthened between said former portion and said support.

6. A talking machine comprising a reproducer, a fixed horn support, and a sound conveyer mounted upon said support, a portion of said sound conveyer extending from said reproducer toward said support, and another portion of said sound conveyer being pivotally movable and artificially lengthened between said former portion and said support.

7. In a device of the character described, a needle, a diaphragm and a tube for transmitting the sound therefrom, said tube having a plurality of convolutions therein, through which the sound waves must pass.

8. In a device of the character described, a diaphragm, a horn holder, and a spirally coiled casing therebetween, the coils of which lie in the same plane.

9. In a device of the character described, a diaphragm, a horn holder, and an artificially extended passage between the horn holder and diaphragm comprising a plurality of turns of like general character.

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Witnesses:
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