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H. KUBO

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SOUND RECORDING AND REPRODUCING APPARATUS

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2 Sheets-Sheet 1

Fig. 1.

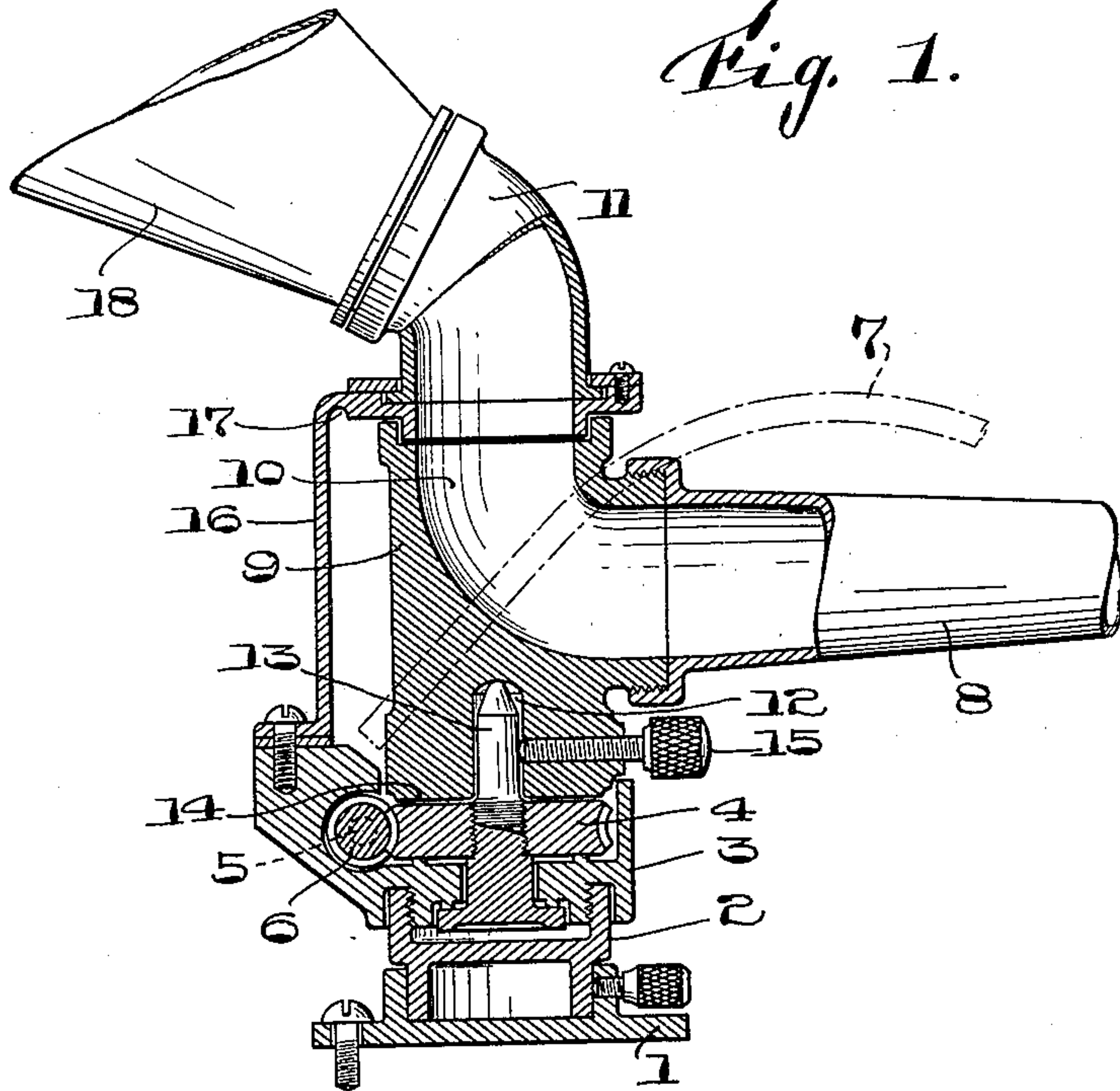
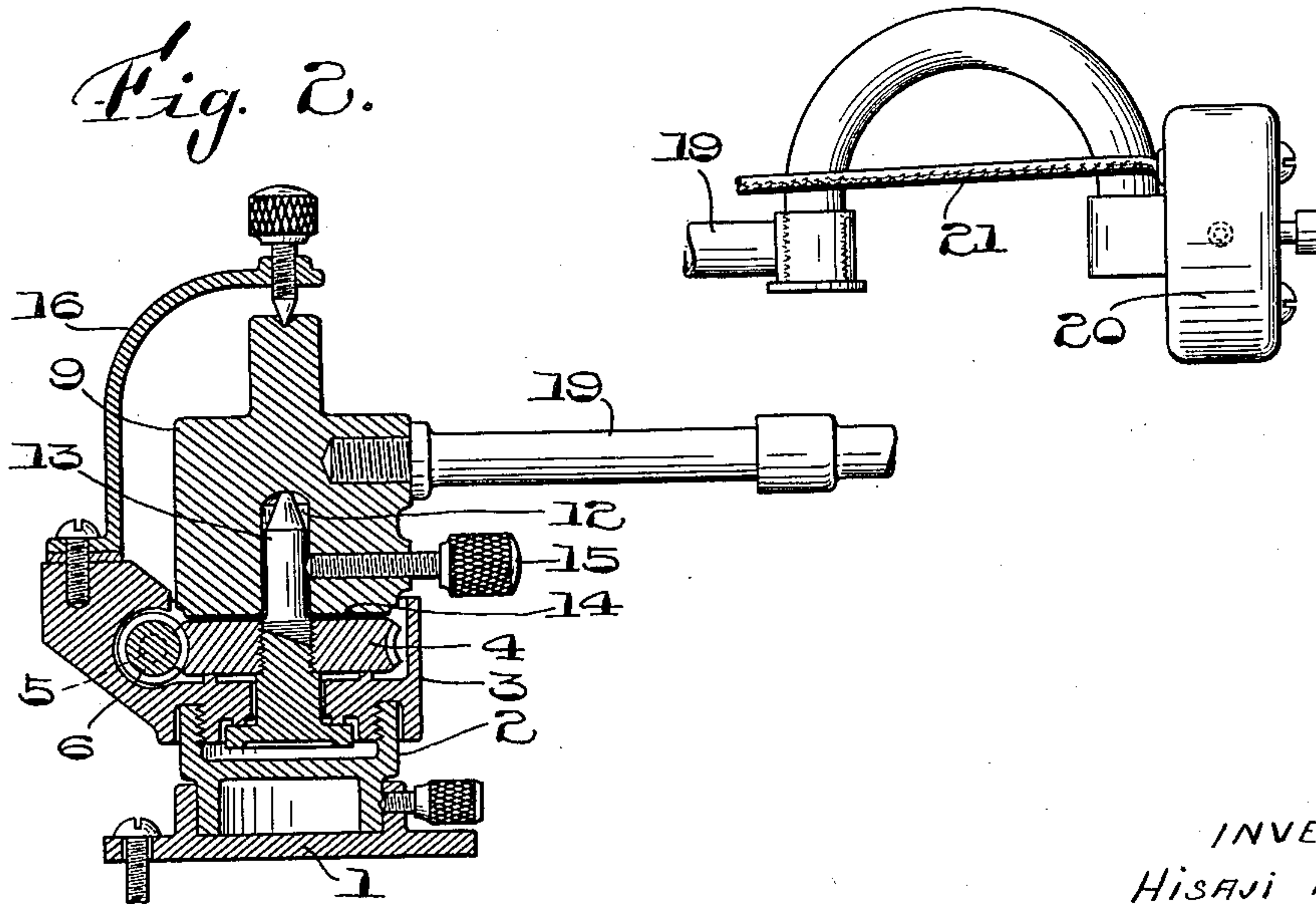


Fig. 3.



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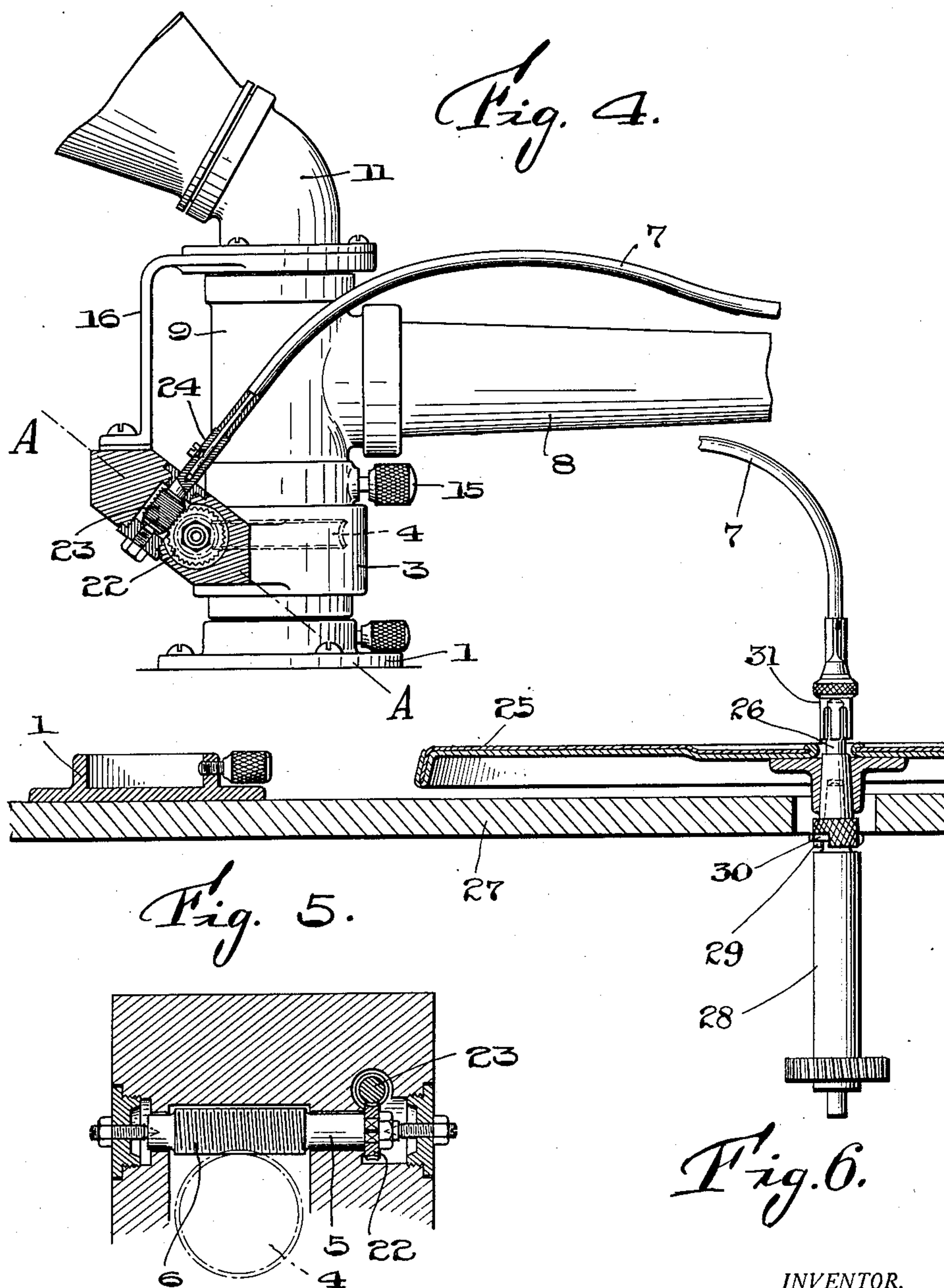
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SOUND RECORDING AND REPRODUCING APPARATUS

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7 Claims. (Cl. 274-13)

The present invention relates to improvements in a sound recording and reproducing apparatus, which consists in fitting loosely a shaft fixed to the horizontal toothed wheel which turns with the rotation of a recording disc, to the base of a sound tube or oscillating arm having a mechanical or electrical vibrator and also providing at said base a clamping screw through which to connect the shaft and base or release them from each other. The object thereof is to obtain an improved apparatus for both recording and reproducing sound which is simple in the construction and easy to handle.

Referring to the accompanying drawings which show an embodiment of the apparatus according to this invention,

Fig. 1 is the longitudinal section of a mechanical sound recording and reproducing apparatus using a sound tube;

Fig. 2, the longitudinal section of an electrical sound recording and reproducing apparatus using an oscillating arm and

Fig. 3, the plan of the end of the oscillating arm.

Fig. 4 is a side elevation, partly in section showing certain parts of the drive for the invention.

Fig. 5 is a detail section on the line A-A of Fig. 4.

Fig. 6 is a sectional view through the phonograph casing, illustrating the means connecting the driven shaft with the disc platen.

In the drawings the same reference numbers denote the same or corresponding parts.

To explain the mode of performing this invention with reference to the annexed drawings, 1 is a suitable fixed part, for example, a supporting base fixed to the casing of a talking machine; and 2, an intermediate member inserted detachably in said supporting base and having its upper part screwed to a toothed wheel casing 3. 4 is a horizontal worm wheel enclosed in said toothed wheel casing; and 5, a worm meshing therewith. The worm 5 is fixed on the shaft 6 whereon is also fixed a worm wheel 22. With the wheel 22 meshes a worm 23 fixed on a shaft 24 which forms an extension of a flexible shaft 7 driven (by means not shown) from the platen supporting shaft 26 of the disc carrying platen 25 common in such machines. The supporting shaft 26 for a disc platen 25 with a blank record thereon and a driven shaft 28 driven mechanically or electrically are mounted in the casing 27 of the phonograph by ordinary means and are connected together by the notch 29 of the shaft 26 engaging the projection 30 of the shaft 28, and said shaft 26 is

further connected to the flexible arm 7 by means of the connecting cap 31 of the latter. 8 is a sound tube; and 9, a rotatable main body having said sound tube inserted in its side. This main body is provided with a sound passage 10 and also has a connecting tube 11 inserted in its upper end. The main body 9 is also pierced with a hole 12 at its lower part to receive the shaft 13 screwed to said horizontal worm wheel, which shaft supports the main body in such a manner that the latter maintains a little space 14 on the horizontal worm wheel so as to prevent frictional resistance from being produced between the main body and the horizontal worm wheel during the rotation of the main body. The main body has at its side a clamping screw 15 by the pressing of which against the shaft 13 the main body and the shaft are fixed, so that the rotation of the horizontal worm wheel is transmitted to the main body. The sound tube gradually turns about the axis of the wheel 4 with the rotation of said wheel and also the connection of the shaft and the main body may be broken by loosening the clamping screw, thus enabling the main body and accordingly the sound tube to turn freely independently of the rotation of the horizontal wheel. 16 is a supporter fixed to the toothed wheel casing with its upper end or horizontal part forming an annular portion loosely fitted to the upper end of the main body. 18 is a horn inserted in the before-mentioned connecting tube.

Next, to explain the manner of recording sound with the present apparatus, firstly the clamping screw 15 is screwed to the shaft 13 and a turntable with a recording disc thereon is connected by means of the flexible shaft 7 with the worm shaft 24 which meshes with the worm wheel 22 for rotating the worm 5. Then, the sound tube 8 will gradually turn inwardly of the recording disc with the rotation of the turntable and consequently the sound entering from the horn 18 is transmitted to the sound tube and the mechanical vibrator at its end and is recorded on the disc by a groove cutter attached to said vibrator.

To reproduce sound with this apparatus, the clamping screw 15 is loosened and said flexible shaft 7 is detached, after which the groove cutter is replaced by a sound needle and sound is reproduced according to the same principle as the common talking machine.

Now, with regard to the electrical sound recording and reproducing apparatus shown in Figures 2 and 3, the oscillating arm 19 having a pickup 20 at the end is attached to the main body, which is supported between the shaft 13 and the

bent end of the supporter 16. 21 is a leading wire.

As explained above, this apparatus has such simple construction that it may be used easily as either a sound recording or sound reproducing apparatus by merely tightening or loosening the clamping screw, so the sound recorded can be reproduced directly from the disc and accordingly it is very convenient to use.

I claim:—

1. In a sound tube support for disc type sound recording and reproducing machines having a driven shaft actuating the disc platen, a fixed base, a shaft revolubly supported on said base, means to operatively connect said last shaft with said driven shaft, a sound tube support revolubly mounted on the base supported shaft, and a set screw extending through a side of said support to engage the shaft whereon said support is mounted.

2. In a sound recording and reproducing machine of the disc type, a base, a member fixed to said base, a vertical shaft revolubly mounted in said member, a body having a sound passage therethrough revolubly mounted on the upper end of said shaft, said body having a tone arm projecting laterally from one end of said sound passage and fixed to the body to rotate therewith, means to drive said shaft, and means to connect the body detachably to the shaft.

3. In a sound recording and reproducing machine of the disc type, a base, a member fixed to said base, a vertical shaft revolubly mounted in said member, a body having a sound passage therethrough revolubly mounted on the upper end of said shaft, said body having a tone arm projecting laterally from one end of said sound passage and fixed to the body to rotate therewith, a worm wheel fixed on said shaft between the body and base and housed in said base, a worm revolubly supported in said base and meshing with the worm wheel, means to drive said worm, and means to connect the body detachably to the support.

4. In a sound recording and reproducing machine of the disc type, a base, a member fixed to said base, a vertical shaft revolubly mounted in said member, a body having a sound passage therethrough revolubly mounted on the upper end of said shaft, said body having a tone arm projecting laterally from one end of said sound passage and fixed to the body to rotate therewith, means to drive said shaft, means to connect the body detachably to the shaft, and means

carried by said base and having at its upper end a bearing revolubly supporting the upper end of said body.

5. In a sound recording and reproducing machine of the disc type, a base, a member fixed on said base, a vertical shaft revolubly mounted in said member, a body having a sound passage therethrough revolubly mounted on the upper end of said shaft, said body having a tone arm projecting laterally from one end of said sound passage and fixed to the body to rotate therewith, a worm wheel fixed on said shaft between the body and base and housed in said base, a worm revolubly supported in said base and meshing with the worm wheel, means to drive said worm, means to connect the body detachably to the support, and means carried by said base and having at its upper end a bearing revolubly supporting the upper end of said body.

6. In a sound recording and reproducing machine of the disc type, a base, a member fixed to said base, a vertical shaft revolubly mounted in said member, a body having a sound passage therethrough revolubly mounted on the upper end of said shaft, said body having a tone arm projecting laterally from one end of said sound passage and fixed to the body to rotate therewith, means to drive said shaft, means to connect the body detachably to the shaft, means carried by said base and having at its upper end a bearing revolubly supporting the upper end of said body, and a horn revolubly supported on the last mentioned means and opening into said sound passage.

7. In a sound recording and reproducing machine of the disc type, a base, a member fixed on said base, a vertical shaft revolubly mounted in said member, a body having a sound passage therethrough revolubly mounted on the upper end of said shaft, said body having a tone arm projecting laterally from one end of said sound passage and fixed to the body to rotate therewith, a worm wheel fixed on said shaft between the body and base and housed in said base, a worm revolubly supported in said base and meshing with the worm wheel, means to drive said worm, means to connect the body detachably to the support, means carried by said base and having at its upper end a bearing revolubly supporting the upper end of said body, and a horn revolubly supported on the last mentioned means and opening into said sound passage.

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