

(No Model.)

E. H. AMET.  
PHONOGRAPH OR TALKING MACHINE.

No. 580,591.

Patented Apr. 13, 1897.

FIG. 5.

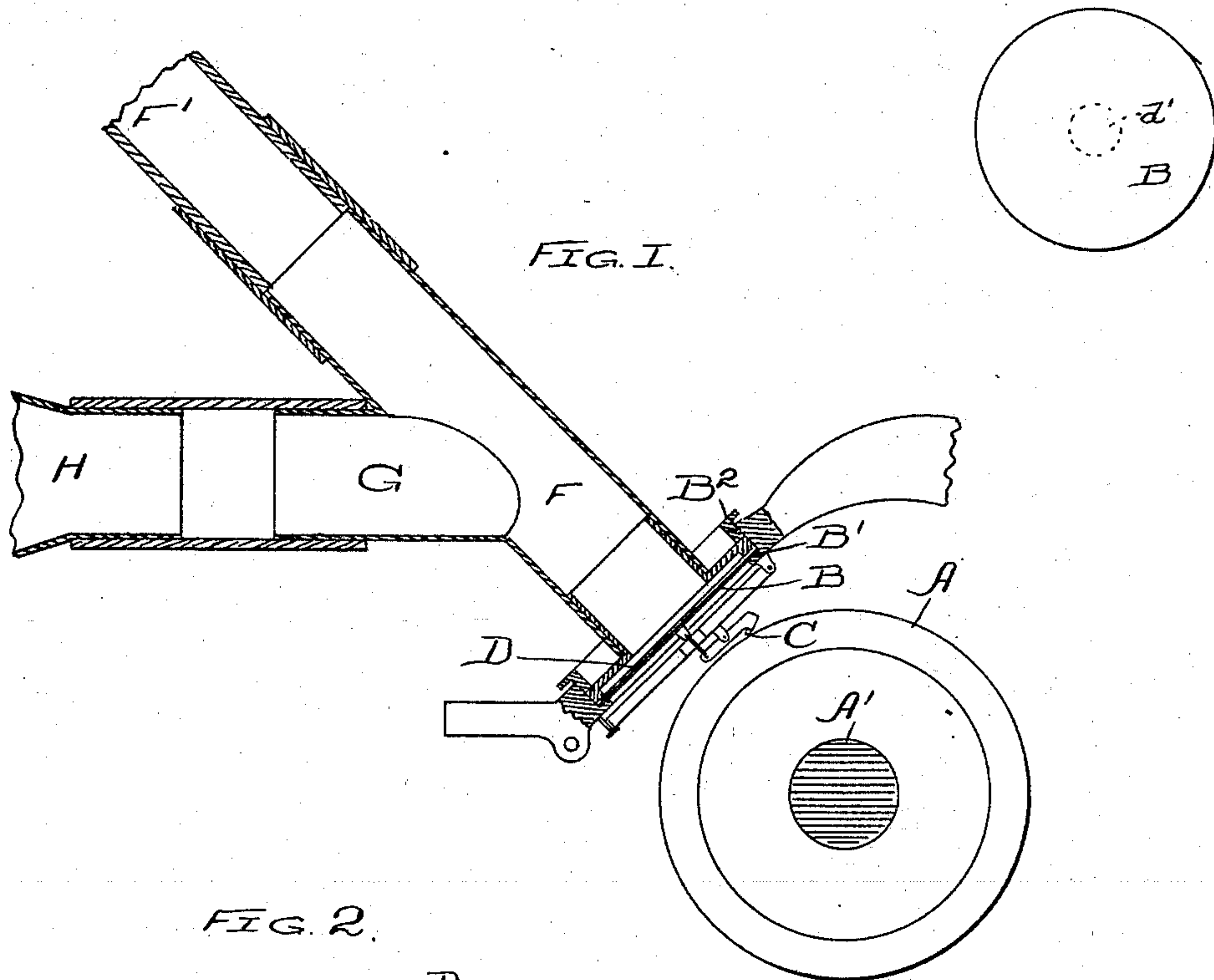


FIG. 2.

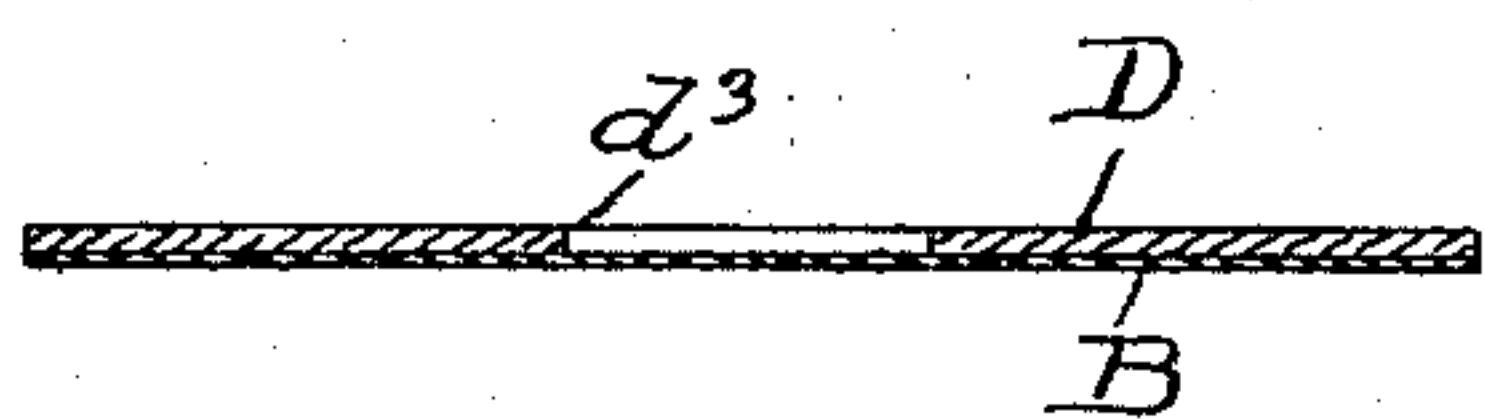


FIG. 3.

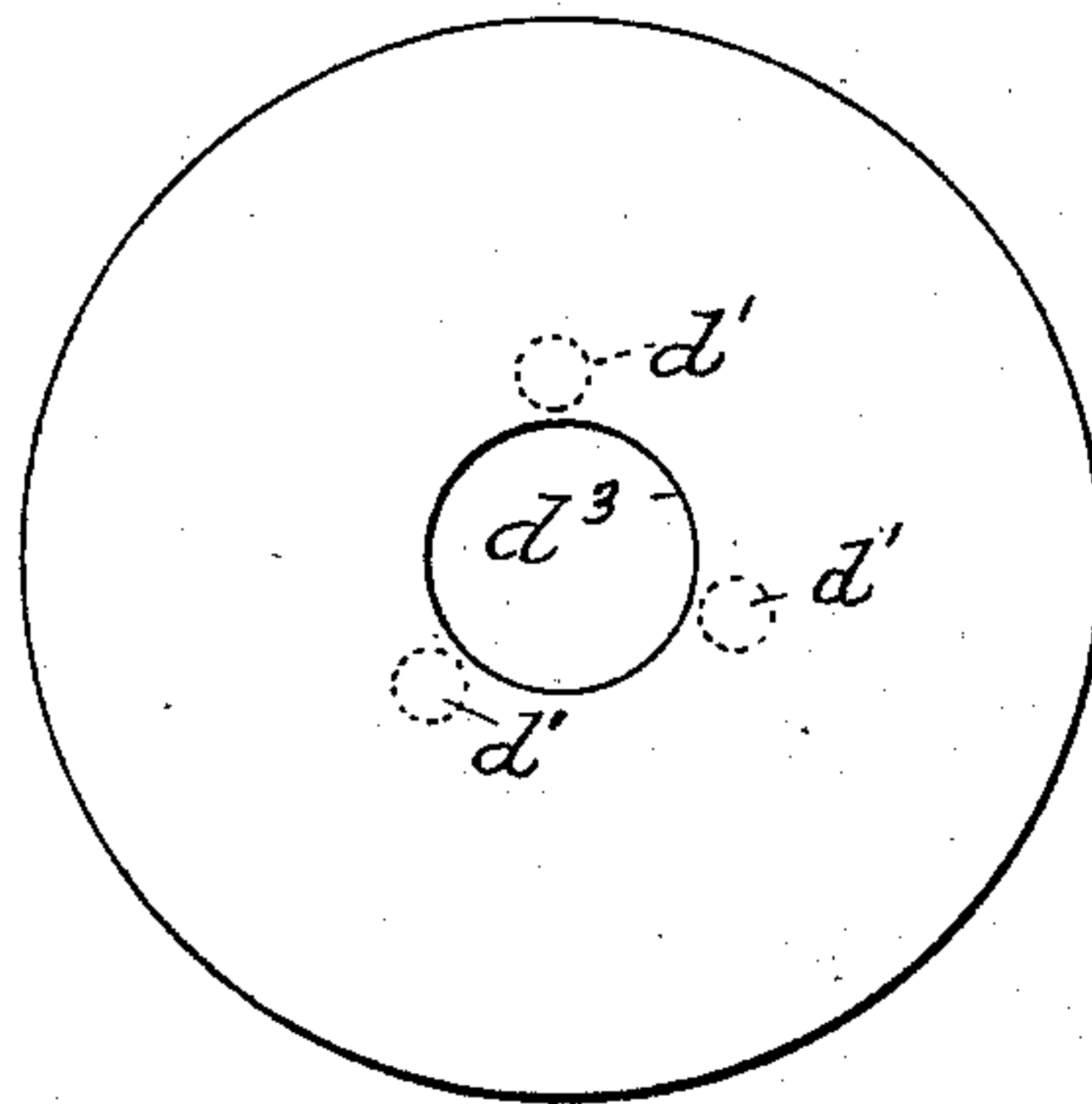
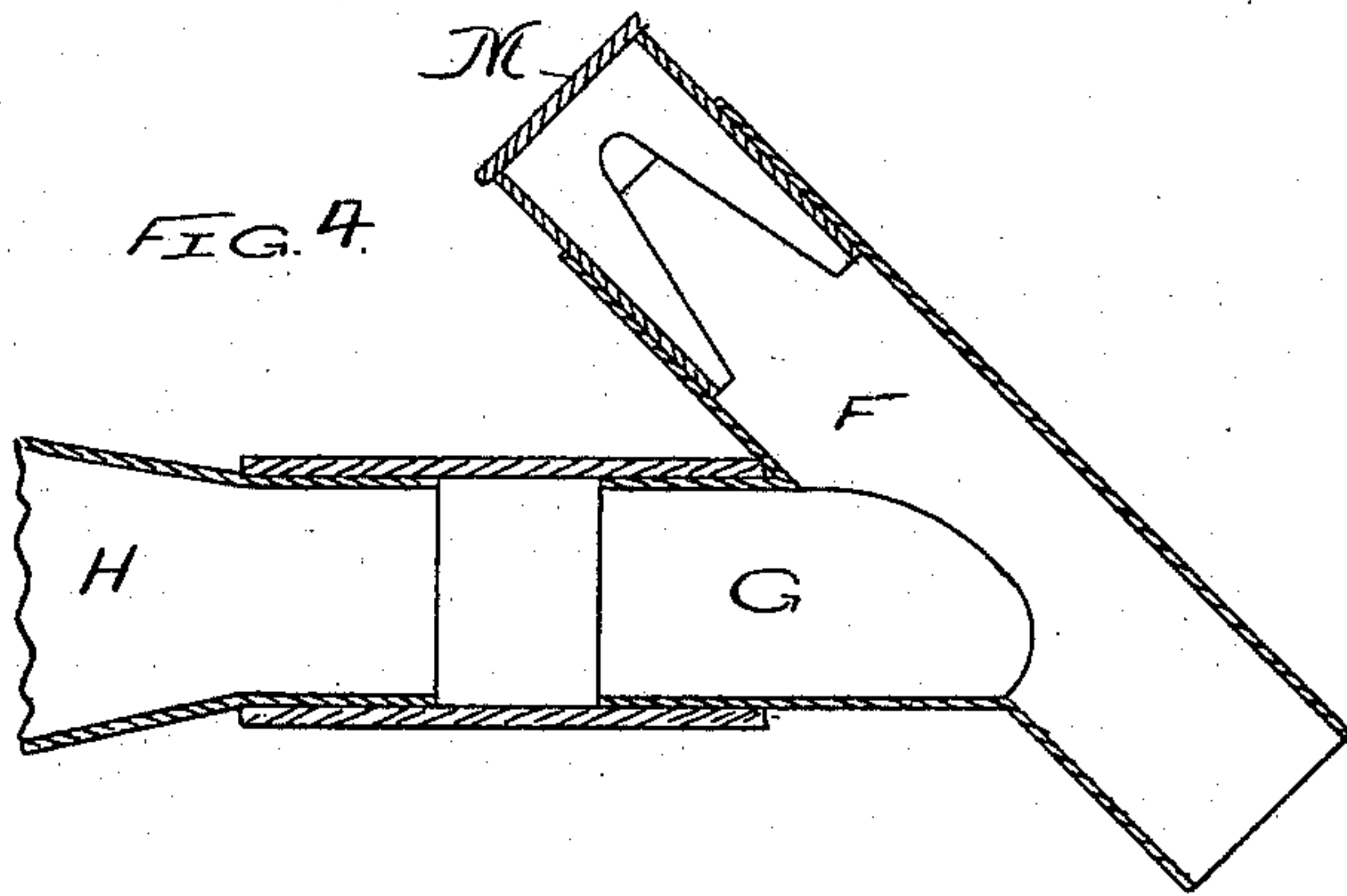


FIG. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EDWARD H. AMET, OF WAUKEGAN, ILLINOIS.

## PHONOGRAPH OR TALKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 580,591, dated April 13, 1897.

Application filed March 28, 1896. Serial No. 585,178. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD H. AMET, a citizen of the United States, residing at Waukegan, in the county of Lake and State of Illinois, have invented a new and useful Improvement in Phonographs or Talking-Machines, of which the following is a specification.

My invention relates to improvements in phonographs or talking-machines.

Heretofore with the phonographs, graphophones, or talking-machines in use it has not been practicable to record and reproduce the ordinary voices of lady singers, for the reason that with ladies' or high-pitched voices the ordinary construction of diaphragm does not seem to respond properly thereto, the result being a discordant, confused, and unintelligible record and reproduction, especially if the lady singer is sufficiently close to the mouthpiece or sings loud enough to produce a useful or commercial record.

The special object of my invention is to so improve the construction of the phonograph, graphophone, or talking-machine as to render it capable of properly and perfectly recording and reproducing voices of lady singers with clearness and distinctness, and incidentally also to cause it to more perfectly record and reproduce other voices, music, and other sounds.

I have discovered, after numerous experiments, and herein my invention consists, that songs of lady singers or other high-pitched sounds may be clearly, distinctly, and perfectly recorded on any ordinary construction of phonograph, graphophone, or talking-machine, when the lady singer sings loudly and naturally and directly into the mouthpiece, by the simple expedient of covering the ordinary glass diaphragm with a thin sheet or disk of soft rubber, the same being tacked or cemented near its center to the diaphragm, and by providing the tube leading from the diaphragm to the mouthpiece with a vent opening or tube extending at an angle to the speaking-tube. The thin sheet or disk of soft rubber serves to cushion the impact of the sound-waves against the diaphragm, or to prevent false, improper, or imperfect or interfering vibrations thereof, or in some other way to prevent the record of ladies' or high-

pitch voices being the customary discordant and unintelligible jumble of sounds heretofore generally produced when it has been attempted to record them by the use of machines having the ordinary or uncovered diaphragms; and the vent with which the speaking-tube is provided also tends to prevent false or improper or imperfect or interfering vibrations of the diaphragm and the record of the same on the phonograph tablet or cylinder. The soft-rubber covering for the diaphragm may also be used with the greatest advantage upon the reproducer.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts in all the views, Figure 1 is a central vertical section through the diaphragm and speaking-tube of a talking-machine, phonograph, or graphophone embodying my invention. Figure 2 is an enlarged detail sectional view of the diaphragm and its soft-rubber covering, and Figure 3 is a plan view of the same. Figure 4 is a central vertical detail section, and Figure 5 is a plan view showing a modification.

In the drawings, A represents a phonogram cylinder or tablet; A', the holder or shaft upon which the tablet is revolved; B, the diaphragm; B' B<sup>2</sup>, the supporting-ring for the rim of the diaphragm, and C the recording point or instrument. All of these parts may be of any ordinary or customary construction—such, for example, as that now generally in use in the familiar phonographs or graphophones.

D is the thin soft-rubber covering for the diaphragm, the same being preferably of the same diameter, so that it may be secured in its place at the edges by the rings B' B<sup>2</sup>, between which the diaphragm itself is clamped. This cushion or covering of soft rubber is tacked, secured, or otherwise fastened with any suitable glue, cement, or mucilage near its center to the diaphragm, in order that the loose unstretched disk or covering of soft rubber may lie flat and securely against the diaphragm.

In practice in attaching the soft-rubber disk or covering D to the diaphragm I ordinarily apply one or more fine spots of mucilage or other glue or cement *d' d'* to the dia-



phragm and then press the flat circular sheet or disk of the soft rubber thereon, causing the mucilage to spread out somewhat, as indicated by the dotted lines  $d'$  in Fig. 3, the dotted lines  $d'$  indicating the area where the soft-rubber disk is cemented or attached to the diaphragm. The thin sheet or disk of soft-rubber covering is preferably about one sixty-fourth of an inch in thickness, although the thickness may be increased or diminished, and it should preferably be made of pure gum and cut of the same size and diameter as the diaphragm, so that it may be applied thereto without stretching it in any direction in order to cause it to cover the whole diaphragm. The thin disk of soft rubber thus forms a soft elastic coating for the diaphragm.

F is the speaking-tube, or tube leading from the diaphragm B to the mouthpiece F', this tube or mouthpiece being of any ordinary construction.

G is the vent opening or tube leading into the speaking-tube F at an acute angle thereto near its lower or diaphragm end, preferably about as illustrated in the drawings. When the singer or operator sings or speaks into the mouthpiece F', the vent opening or tube G tends to prevent reverberations of the sound-waves in the air in the tube F and false or over vibrations of the diaphragm and enables me to produce much more distinct, clear, and perfect records than can be produced when this vent opening or tube is omitted, especially when the operator or singer sings or speaks loudly and directly into the mouthpiece, as required in making useful commercial sound-records.

When the machine is being used for taking or recording instrumental music, I prefer to attach the horn or receiving-trumpet H to the branch G and use the tube F as the vent. When vocal and instrumental music are being simultaneously taken or recorded, I ordinarily attach the receiving trumpet or horn H for the instrumental music to the branch G and the mouthpiece-tube F' to the tube F, in which case the tube G operates as a vent for the vocal sound-vibrations of the air in the tube F, adjacent to the diaphragm, while, on the other hand, the tube F operates as a vent or escape for the instrumental sound-vibrations received through the tube G.

In practicing my invention I have generally applied my soft-rubber coating or covering to the ordinary glass diaphragm now customarily in use in phonographs and graphophones, and in the drawings I have indicated a glass diaphragm, but my invention may be used with diaphragms made of any other material than glass. While the thin soft elastic coating D for the diaphragm is preferably composed of soft rubber, I wish it to be understood that my invention is not necessarily limited to this material.

As I have found by my experiments that

the soft elastic coating on the diaphragm is of great advantage for reproducing as well as recording sounds, my invention is not limited to its use in connection or combination with a recording point or stylus, but may be also used in connection or combination with a reproducing point or stylus, and as it is combined with a reproducing point or stylus in substantially the same manner as it is with a recording point or stylus it is not necessary to duplicate the drawings with a reproducing point or stylus substituted for the recording point or stylus which I have indicated in the drawings.

As illustrated in Fig. 4, the horn or receiving-trumpet is applied to the tube G, and the direct tube F is furnished with a regulating-cap M, having a slot  $m$ , preferably V-shaped, to adjust the area of the vent-opening. As the tubes F and G are of the same size, the regulating cap or valve M may also be applied to the angular tube G, if desired, but I find that usually the best results are produced without its being applied to the tube G when the singer sings directly into the tube F, the vent G being left entirely open.

The soft-rubber disk or covering D in its more perfected construction is provided with a small hole or opening  $d^2$  at its center, substantially as illustrated in the drawings in Figs. 1 and 3; but this opening may be omitted, as shown in the modification Fig. 5.

I claim—

1. In a talking-machine the combination with a recording point or stylus, of a diaphragm, clamp-rings for supporting the diaphragm, a thin soft-rubber covering for the diaphragm, a speaking-tube leading to the diaphragm, and a vent opening or tube leading into said speaking-tube near the diaphragm, substantially as specified.

2. A diaphragm for a talking-machine having a thin soft-rubber covering, substantially as specified.

3. A diaphragm for a talking-machine, having a thin soft-rubber covering of the same diameter as the diaphragm so that it may be secured at its edges between the clamp-rings for the diaphragm, substantially as specified.

4. A diaphragm for a talking-machine having a thin soft-rubber covering, said soft-rubber covering being secured or cemented near its central portion to the diaphragm, substantially as specified.

5. A diaphragm for a talking-machine consisting of a thin disk of hard material, having a thin covering or coating of soft material, substantially as specified.

6. A diaphragm of thin glass or other hard material provided with a thin soft elastic covering or coating, substantially as specified.

7. A diaphragm of thin glass or other hard material, provided with a thin, soft, elastic covering cemented thereto near its central portion only, substantially as specified.

8. In a talking-machine, the combination



with a recording point or stylus, of a diaphragm, clamp-rings for supporting the diaphragm, a speaking-tube leading to the diaphragm and a vent opening or tube leading  
5 into said speaking-tube near the diaphragm, and a regulating cap or valve M for one of said tubes, substantially as specified.

9. A diaphragm of hard material for a talk-

ing-machine having a thin covering of soft material provided with a hole or opening near its center, substantially as specified.

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Witnesses:

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