

P. B. DELANY,
TALKING MACHINE.
APPLICATION FILED JAN. 3, 1913.

1,190,635.

Patented July 11, 1916.

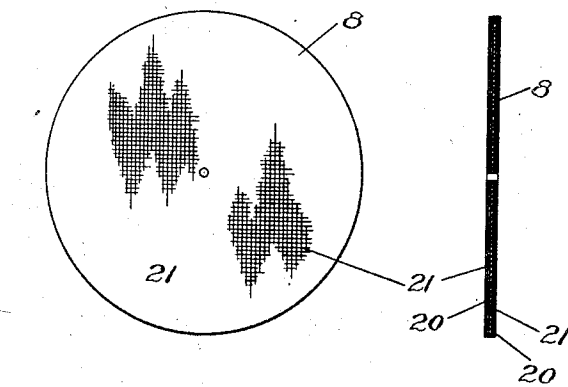
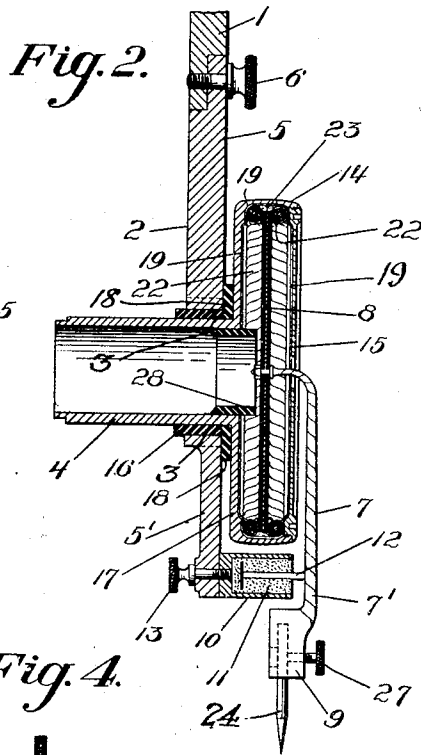
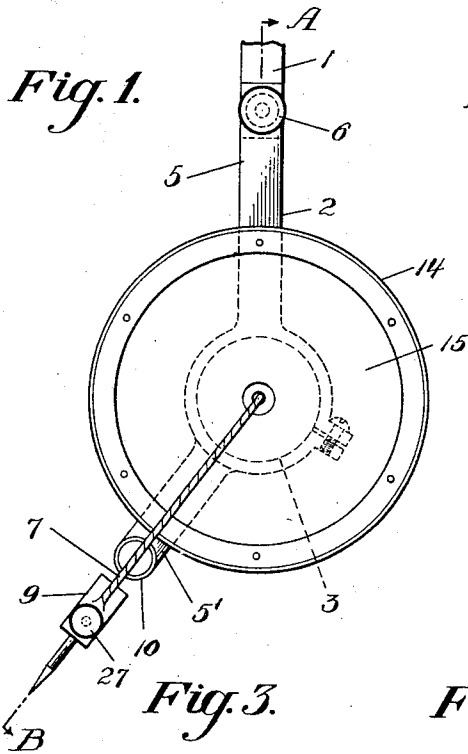


Fig. 4.



Witnesses:
L. J. Browning
M. L. Smith

Patrick B. Delany, Inventor
By *Edward C. Kridner*
Attorney

UNITED STATES PATENT OFFICE.

PATRICK B. DELANY, OF SOUTH ORANGE, NEW JERSEY.

TALKING-MACHINE.

1,190,635.

Specification of Letters Patent.

Patented July 11, 1916.

Application filed January 3, 1913. Serial No. 739,939.

To all whom it may concern:

Be it known that I, PATRICK B. DELANY, a citizen of the United States of America, residing in South Orange, county of Essex, State of New Jersey, have invented a certain new and useful Improvement in Talking-Machines, of which the following is a specification.

This invention is more particularly applicable to reproducing machines and its objects are to improve the behavior of such machines. The record with which this invention may be used may be of any well known or appropriate character.

In the accompanying drawing: Figure 1 is a side elevation: Fig. 2, a section on the line A, B, of Fig. 1: Fig. 3, a face view of a reproducer diaphragm: Fig. 4, a transverse section thereof.

1 indicates the end of the swinging arm that carries the reproducer head as a whole.

2 is what I term an extension piece having an enlarged central aperture 3 to embrace the neck 4 of the reproducer head or sound box in which the diaphragm is mounted. This extension piece has a branch 5 in one direction which by means of a bolt 6 may be attached to the end of arm 1. A second branch 5' of the extension piece carries means of affording a support for the vibrating reproducing arm 7 attached at one end to the diaphragm 8 and at the other end having a needle holder 9 in which is secured by a screw 27 the needle 24. The particular vibrating arm support of the character indicated forms the subject matter of an application heretofore filed by me (No. 700,394, filed May 29, 1912) and is as follows: Such supporting means comprise a receptacle or container 10 filled with a mass of material 11 inert to vibrations and in which is embedded an arm or rod 12 attached rigidly to the vibrating arm 7 and extending laterally therefrom into or through the mass of the vibration-absorbing or vibration eliminating material in the receptacle or container 10. The container 10 is shown as a separately formed cup held on the end of branch 5' by a clamp bolt 13. The reproducer head comprises the neck 4 that carries the sound box 14 in which is mounted the reproducer diaphragm 8. The outer face of the sound box is closed, except for a central opening, by a cover plate or diaphragm 15. The neck 4 passes through the aperture 3 of the extension piece 2, the

two being firmly united preferably with an intervening bushing 16 of a suitable material or compound inert to transmission of vibrations; and between the side 17 of the sound box and the extension piece is interposed a washer 18 of material inert to vibrations. In this way the neck and sound box are insulated from disturbing vibrations that otherwise might pass from the swinging arm 1 to the reproducer diaphragm: and also the vibrating arm 7, co-operating with the diaphragm, is insulated in the manner described from vibrations that may be taken up or imparted to the extension piece 2 and the parts carried thereby: and also the vibrating arm is insulated because of its manner of support in such way that its vibrations will not be transmitted through its support.

The purpose of the various features thus far described is to enhance the purity of reproduced sounds and utterances.

For the purpose of further eliminating extraneous and unpleasant qualities in the reproduced sounds, I coat the sound box, preferably on the inside, with a layer of paint or composition,—as for instance, asphaltum varnish or a paint-like solution of adhesive compound. This coating is, of course, thin and is exaggerated in the drawing for the purpose of illustration and is marked 19. I have also found that good results are produced by lining the sound box and neck with a fabric such, for instance, as silk,—preferably a soft unfilled variety or with thin paper. Such fabric lining is also indicated by 19. A convenient way of applying the fabric would be to first put on the surface a thin coat of paint or varnish and apply the fabric while such coating is yet wet.

To further improve the quality of reproduced tones, I have found that advantageous results are attained by a special construction of the diaphragm. This feature is illustrated in Figs. 3 and 4. Diaphragms ordinarily used in talking machines have been made of a variety of materials, the most popular of which is mica. My improvement, however, may be applied to diaphragms other than those of mica. The object of the improvement is to attain a greater degree of uniformity of vibration and in the case of mica to overcome the tendency of the flakes or layers to separate and move one upon another. I there-

fore coat the diaphragm with a suitable paint or sticky substance, such as the varnish above suggested, and impress upon the wet surface a disk of thin paper, or thin woven fabric, such as silk, and maintain the parts under pressure until there is an intimate union of them. This is shown in the drawing where 20 may be taken to indicate a coating of adhesive material 10 and 21 the facing of paper or fabric.

The manner in which the diaphragm is mounted in the head or sound box is shown in Fig. 2. On each side of the diaphragm adjacent its edge is a circular gasket 22 composed of a central core of wire and a surrounding closely adhering coating of insulating material formed or molded upon the wire. These gaskets are seated against the wall of the head and the diaphragm is clamped between them. Back of the circular gaskets is a filling of adhesive plastic compound 23 and the parts are drawn up tight by any appropriate means. To further exclude undesirable vibrations from the diaphragm, I have in a measure controlled the extra or local node vibrations of the vibrating arm and experience has shown an improvement in the result. To this end the vibrating arm is covered with a layer of adhesive material, such as paint, or asphaltum varnish, and the result sought may be enhanced by wrapping upon this coating, while still wet, a strip of thin fabric, such as silk, indicated by 7'.

A further feature of construction, designed to improve the quality of reproduced tones, is shown in detail in Fig. 2, wherein is shown a tube 28 extending from within the neck into close juxtaposition to the diaphragm. The tube, when adjusted, may be secured by a suitable adhesive. The proximity of the inner end of the tube 28 to the surface of the diaphragm should be such as to permit the greatest amplitude of vibration of the diaphragm without contact with the tube. Aside from this, the adjustment may be that best suited to the particular instrument. I have found very highly satisfactory results when the adjustment is such that the space between the face of the diaphragm and the end of the tube is sufficient, and practically no more, to permit the greatest range of vibration of the diaphragm. I have also demonstrated that if the tube 28 is made of rubber, meaning by that term "semi-hard" rubber, admirable results in the way of improved quality of tone are afforded. The tube may, however, be of hard rubber or of other materials including metal.

A further feature of this invention is

that if the mass 11 in the container 10 is of such character as to form a stable permanent support at room temperature, and will on application of heat be softened, there is thereby afforded a very admirable mode of adjusting the vibrating arm with the utmost nicety as follows: When the arm is attached to the diaphragm and the projection therefrom seated in the vibration absorbing mass, if the adjustment is not such that the diaphragm remains in its normal flat plane without undue stress in either direction, application of heat to the container will render its contents sufficiently plastic to permit of adjustment of the support by the minutest shades of change. Thus a perfect condition may be established that becomes permanent when the plastic mass has set.

A suitable compound for the purposes above stated consists of one part by weight of Stockholm tar, one part by weight of resin and three parts by weight of gutta-percha.

In my application for Patent No. 867,709, filed Oct. 21, 1914, I have claimed a method herein generally described of connecting certain parts of the reproducing mechanism of a talking machine, and in my application No. 867,710, filed Oct. 21, 1914 I have claimed a construction involving a support for the stylus arm, comprising a flexible metallic part embedded in a yielding meltable mass.

I claim:

1. In a talking machine a diaphragm mounted between gaskets composed of non-stretchable central cores of wire and closely adhering insulating material molded thereon.

2. In a talking machine, a diaphragm, a supporting frame therefor and a retaining gasket consisting of a non-stretchable core of relatively hard material and closely adhering insulating material molded thereon.

3. In a talking machine the combination with a sound box the inner faces of which are coated with a dampening material, a diaphragm mounted therein and also coated with a dampening material, a vibrating arm attached to the diaphragm and coated with a dampening material, and a support for the vibrating arm mounted in a mass inert to vibrations.

In testimony whereof, I have hereunto subscribed my name.

PATRICK B. DELANY.

Witnesses:

L. L. BROWNING,
LAURA E. SMITH.