

L. T. HAILE.
SOUND BOX FOR TALKING MACHINES.
APPLICATION FILED APR. 8, 1909.

963,546.

Patented July 5, 1910.

Fig. 1.

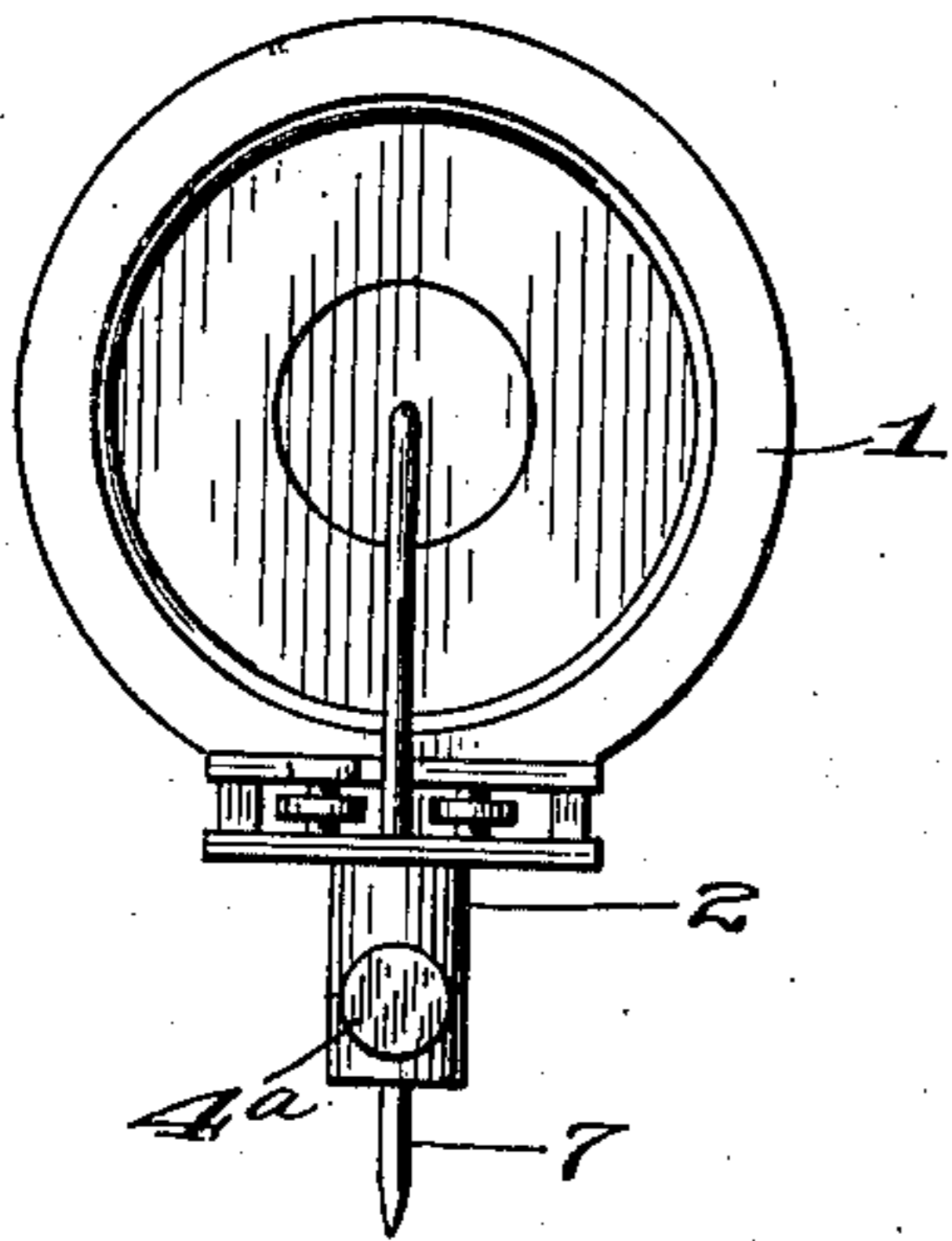


Fig. 2.

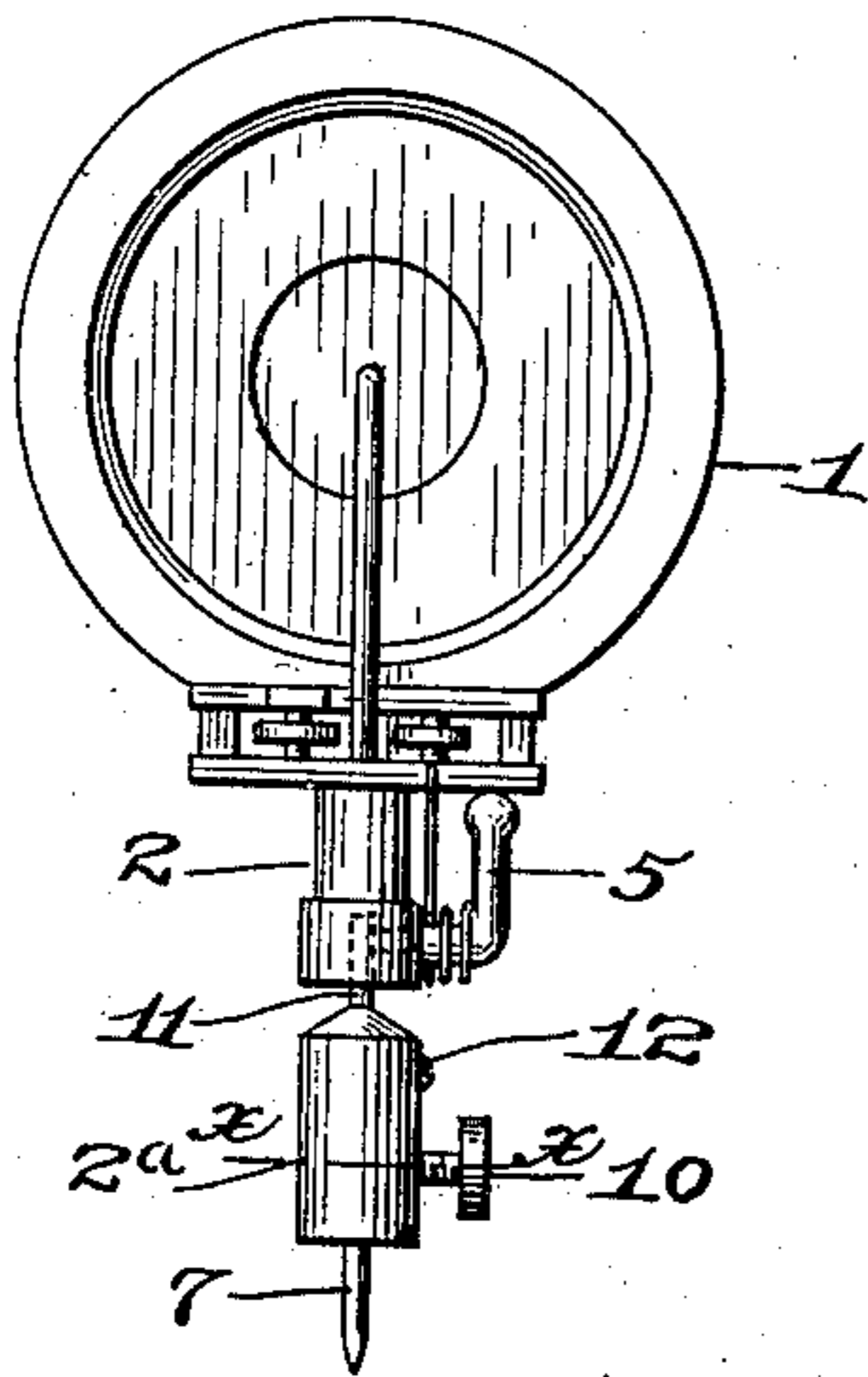


Fig. 3.

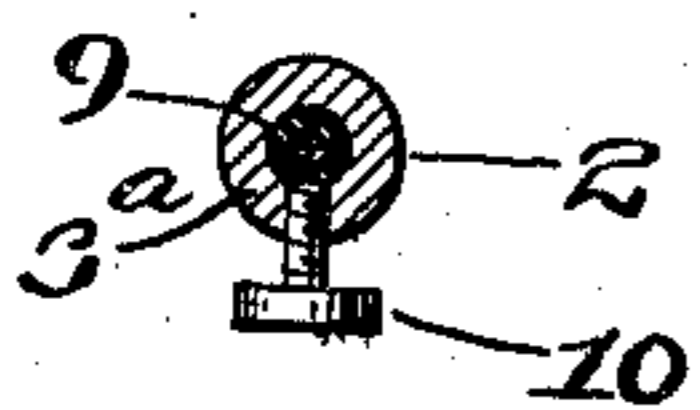


Fig. 4.

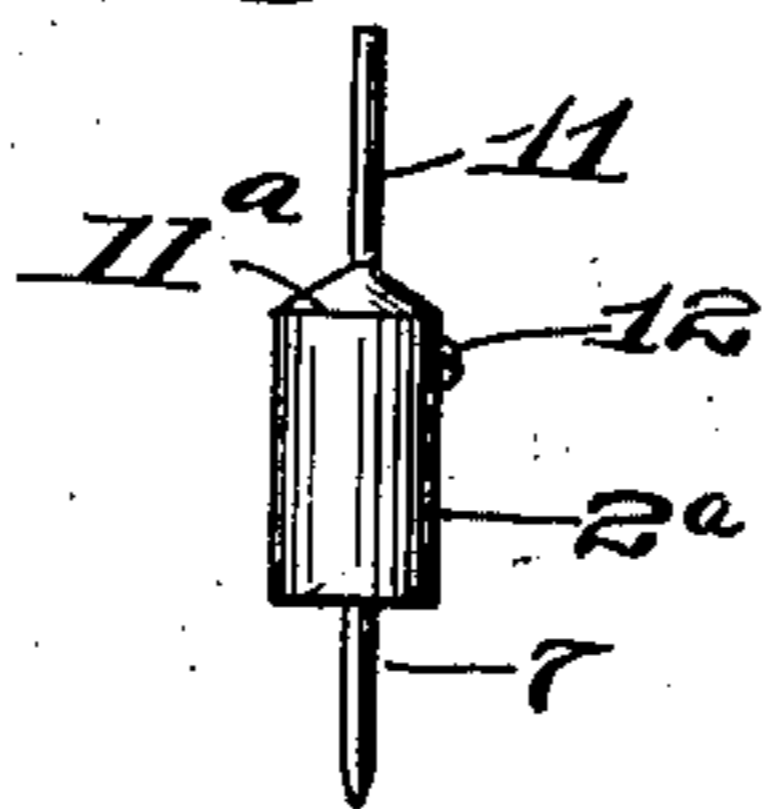


Fig. 5.

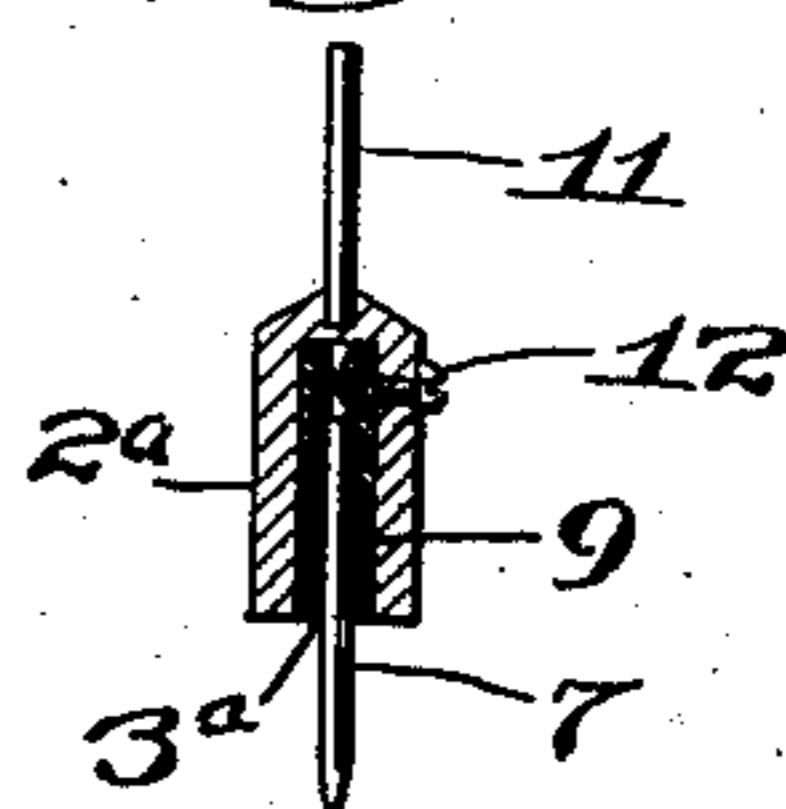


Fig. 6.

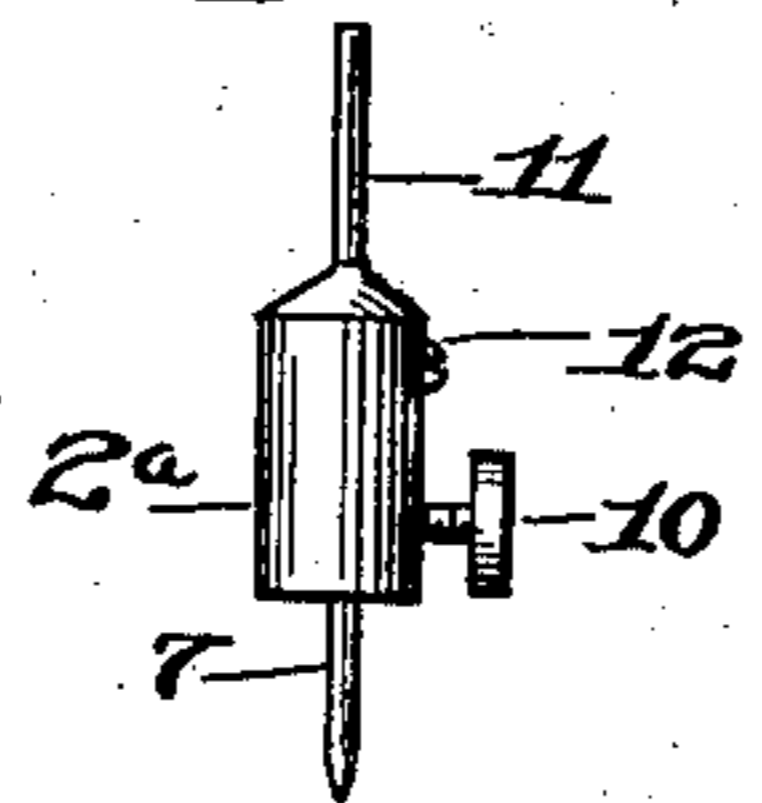
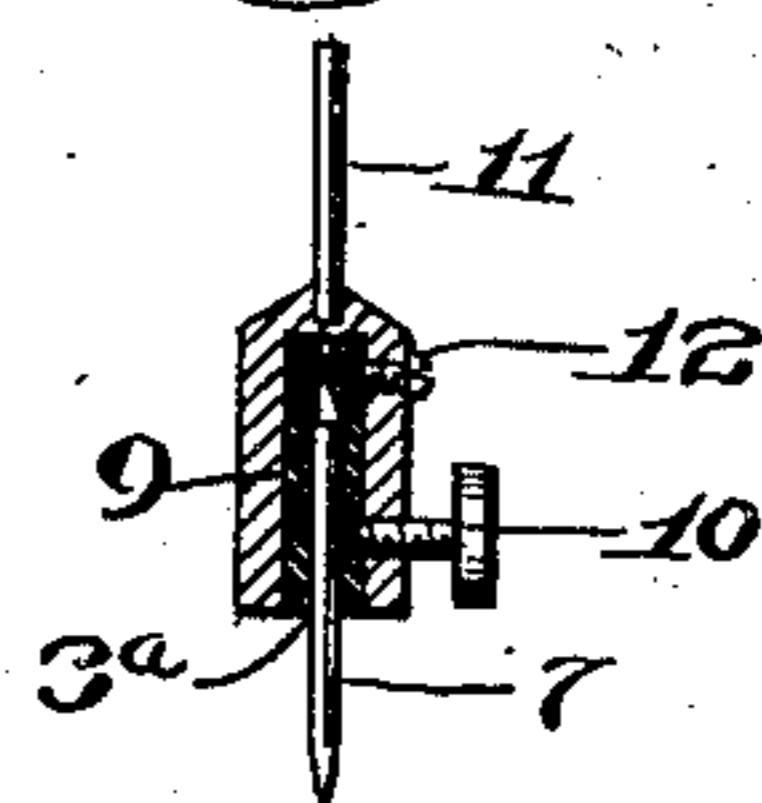


Fig. 7.



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LUTHER T. HAILE, OF PHILADELPHIA, PENNSYLVANIA.

SOUND-BOX FOR TALKING-MACHINES.

963,546.

Specification of Letters Patent.

Patented July 5, 1910.

Application filed April 8, 1909. Serial No. 488,546.

To all whom it may concern:

Be it known that I, LUTHER T. HAILE, citizen of the United States, residing in the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Sound-Boxes for Talking-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to sound-boxes for talking machines and has for its object the provision of means supplemental to and operatively detachable and replaceable from and to the usual needle-holder of the sound-box, without interference with the usual function and capacity of the latter to retain a needle removably in its longitudinal aperture by any known means; my invented means imparting to the sound-box and its needle-holder an additional function, namely increasing its capacity to produce loud or soft tones from the same stylus or needle. Such result has never been heretofore effected, by any needle-holding means.

Heretofore to accomplish the ultimate result stated, it was and is necessary, when desiring to produce both loud and soft sound waves from the diaphragm of the sound-box to use two well known types of needles, namely a "hard" needle, so-called, in the needle holder, for production of loud sound waves or tones, and then removing the former and substituting a "soft" needle, so-called, in the needle holder, and vice versa, according to the result desired. The former kind of needles are comparatively cheap and most largely used, while the latter are relatively expensive. My invention increases the capacity and functions of the known sound-box and needle-holder, by enabling it to perform, with a common "hard" needle the function of a "soft" needle as well, at the pleasure of the operator, and incidental thereto it also increases the range of use of the primary needle holder by enabling the operator to use specific shapes, such as triangular in cross-section or otherwise, of needles, the supplemental needle-holder having a bushed needle-holding aperture adapted to that end, not as its primary purpose but, as before stated, an incidental advantageous capacity; and I might further properly speak of another incidental advantage, namely, that it enlarges the useful life of any "disk" record because taking up and elim-

inating the scratchy noises produced by an ordinary "hard" needle on such a record, the grooves of which also quickly become worn by abrasion from such a needle; in other words by the use of any supplemental and detachable needle-holder with the usual primary needle-holder of a sound-box, not only is the necessity for a "soft" needle to produce soft tonal effects entirely eliminated, but the "hard" needle is given the capacity to produce its usual "loud" tones when desired, to produce "soft" tones when desired, and to produce the "soft" tones with a materially lessened degree of abrasive effect on the record.

In the drawings illustrating my invention, Figure 1 is a top view of a usual type of sound-box and needle-holder, on which my improvement is adapted to be employed; Fig. 2 is a like view, of the former and of my improvement detachably attached thereto; Fig. 3 is a section on the line $x-x$ of Fig. 2. Figs. 4 and 5 are elevation and section of the supplemental needle-holder of Fig. 2 detached from the primary needle-holder of Fig. 1, and Figs. 6 and 7 are like views as Figs. 4 and 5, but with the addition of a tone-modifying screw.

Referring now to said drawings, 1 indicates a sound-box of known construction, for a talking machine, and consisting, speaking generally, of a circular frame, supporting a diaphragm and adjunctive parts not necessary to refer to, except that it is provided with a needle-holder 2, and which consists of a short metallic cylinder which is longitudinally bored to permit the insertion therein of the heel end of the needle 7; and means to hold it removably therein when it is desired to remove same and insert a new one.

As the vibratory sound-waves from the diaphragm of the sound-box are transmitted through the needle, it is obvious that the physical contact of the spring-controlled holding-pin therewith has objectionable effects aside from its existence as an added mechanical element, and moreover in sound-boxes employing such character of holding means, a "soft" needle has to be substituted for the usual "hard" needle when a sound-record is played producing sound-waves whose tone require a "soft" needle, and which would be very ineffectively produced by the use of the usual "hard" needle.

In my device, operatively employed, as shown in Fig. 2, said usual holding means, 4

does not contact with the needle at all, but with the shank or spindle 11 on the apex of the supplemental needle-holder, and, as hereinafter described I employ no direct mechanical needle-holding means at all, but in lieu thereof provide the longitudinal aperture 3^a of the supplemental holder (Fig. 5) with a bushing of resilient material 9 which performs the double function of detachably holding the needle by frictional contact, resiliently applied, and converts the sound wave created by the needle from hard to soft.

I will now describe its construction in detail by reference to the drawings:

Without altering the known form of needle-holder 2, shown in Fig. 1 and top part of Fig. 2, but preserving and retaining the same exactly as it is, both as to construction, mode of operation and function, as a necessary adjunctive element of my improvement thereon, I add a supplemental and duplicate needle-holder, indicated at 2^a in Fig. 2 and shown in detached elevation in Figs. 4 to 7, constructed in such manner as to be detachably removable and replaceable, from and in the primary and usual needle-holder 2, in substitution, when desired, for the stylus or needle 7 removably supported operatively therein as usual. This result is effected by making the body portion 2^a quite similar, as a short cylindrical body, to the usual holder body 2, and providing it with a longitudinal aperture 3^a, which latter is lined with a bushing 9 shown as a tubular body of compressible and resilient material, such as soft vulcanized rubber, whereby to create a resilient frictional holding contact with the shank end of the inserted needle 7; and to that end the relative diametric proportion of the aperture 3^a and bushing 9 to each other and to the shank end of a needle is accordingly, while the length of both 3^a and 9 are such as to accommodate fully the holding portion or shank of the needle which is about two-thirds its whole length. If desired, the bushing may be mechanically held in place by a small screw 12. But the resilient needle-holding function of the bushing is not its sole function, an additional and primary function being that it modifies or softens the sound-vibrations passing through the needle to the diaphragm of the sound-box; and even this effect in turn may be governed and regulated to a nicety, enabling the player to graduate and change the gradations of tone-effect, of even an ordinary hard needle, if desired, by the employment of a set screw 10 so mounted in the holder-body 2^a that its point can be brought to compress the wall of the resilient bushing against the shank of the needle, giving firmer hold and stronger vibration without metallic contact; and this in addition to the function of the supplemental and de-

tachable character of the improvement in eliminating the otherwise necessary resort to a plurality of different kinds of needles for such purpose, and indeed with greater certainty of producing the exact tone effect desired.

Another feature of importance, due to the constructional character of the body 2^a of the supplemental holder is that its exterior top is made with an annular bevel, indicated at 11^a, Fig. 4, on the apex of which is a stem or spindle 11 adapted to be inserted, (like a needle 7) in the usual longitudinal needle-holding aperture of the primary or usual needle-holder 2 (Fig. 1) as indicated by the dotted lines in Fig. 2. The function of the annularly beveled apex 11^a on the supplemental holder is that there can be no contact thereof with the flat basal end of the primary needle-holder 2, and hence no chance for a rattling contact, due to vibration, which might occur if both had flat surfaces coinciding.

It should also be observed that the shape of the aperture in needle-holders as now constructed, is not confined to circular in cross-section, but is sometimes rectangular or triangular, and it may be the same in mine, as also may be the shape of the lining or bushing interiorly, and moreover it is not essential for softening the tone effect that the lining or bushing be tubular or continuous around the needle, that effect being attained by insulating so to speak, the needle body keeping it from contact with the metallic wall of the aperture in the needle-holder. But it is essential that the lining or bushing shall be of an inherently resilient material, such as rubber tubing for example, provided it be sufficiently compressible that when pressure is exerted against it by the insertion of the end of the needle or by the tone-modifying screw, a frictional resistance will be created between it and the needle end.

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

1. In a sound-box having a fixed depending needle-holding arm longitudinally apertured to removably support a needle therein, with co-acting needle-holding means, a supplemental needle-holder having a supporting pin on its apex and adapted thereby to be detachably mounted in said aperture of the primary needle-holder, and in alignment therewith, said supplemental holder having a body portion which is longitudinally recessed, with a bushing of resilient material in said recess adapted to operatively support a needle by frictional contact due to radial compression.

2. In a sound-box having a fixed depending needle-holding arm, longitudinally apertured to removably support a needle therein,

with co-acting needle-holding means, a supplemental needle-holder having a body portion with a conical head and a supporting pin on the apex of said head, adapted thereby to be detachably mounted in said aperture of the primary needle-holder and in alinement therewith, said body portion being longitudinally recessed from its basal end upward, with means to removably support a needle in said recess.

3. In a sound-box having a fixed depending needle-holding arm longitudinally apertured to removably support a needle therein, with co-acting needle-holding means, a supplemental needle-holder having a body portion with a conical head and a supporting pin on the apex thereof, and adapted thereby to be detachably mounted in said aperture of the primary needle-holder and in alinement therewith, said body portion being longitudinally recessed and provided with a bushing of resilient material in said recess adapted to operatively support a needle by frictional contact due to radial compression.

4. In a sound-box having a fixed depending needle-holding arm longitudinally apertured to removably support a needle therein, with co-acting needle-holding means, a supplemental needle-holder having a body portion with a conical head and supporting pin on the apex thereof and adapted thereby to

be detachably connected to and in alinement with the primary needle-holder, said body portion being longitudinally recessed and provided with a lining of resilient material in said recess adapted to wholly insulate the needle from the metallic walls of said recess and to operatively support the shank end of the needle by frictional contact due to radial compression of said resilient lining.

5. In a sound-box comprising a fixed depending needle-holding arm which is longitudinally apertured, and having means to detachably lock the shank of a needle therein, a supplemental needle-holder having a body portion and a supporting pin on its apex adapted to be detachably substituted for a needle in said needle-holding aperture of the primary needle-holder and in alinement therewith, said body portion having a needle-holding aperture, a bushing therein of resiliently compressible material such as rubber tubing, with means to adjustably compress said resilient bushing against the shank of the needle to vary the tone vibrations.

In testimony whereof, I have hereunto affixed my signature this thirty-first day of March A. D. 1909.

LUTHER T. HAILE.

Witnesses:

A. M. BIDDLE,
R. A. DUNLAP.