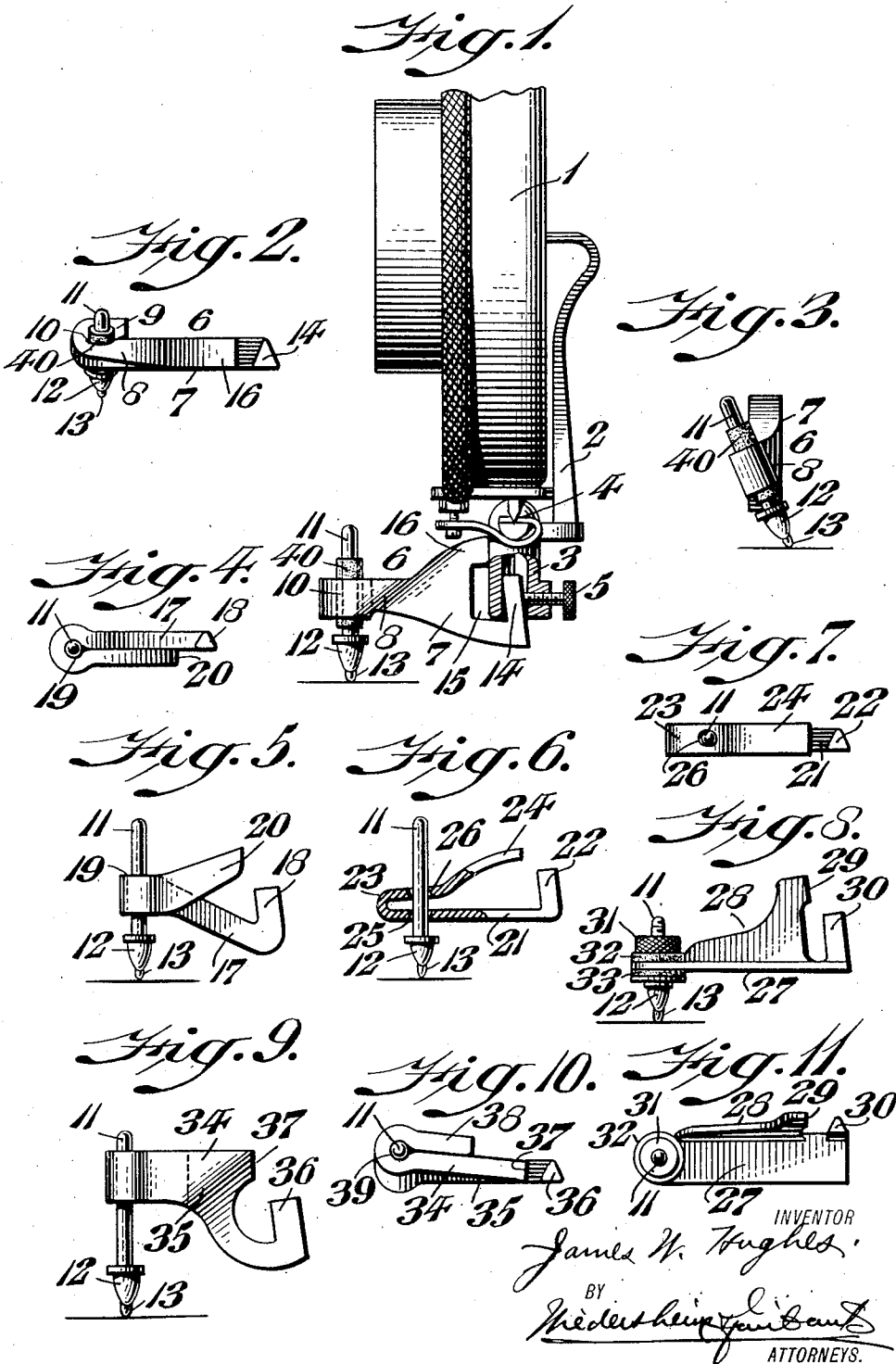


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 OFFSET STYLUS ARM.
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UNITED STATES PATENT OFFICE.

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OFFSET STYLUS-ARM.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, JAMES W. HUGHES, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Offset Stylus-Arm, of which the following is a specification.

My present invention comprehends a novel construction of a stylus arm which is adapted to be employed in conjunction with a sound box constructed to play records of the lateral cut type in order to adapt them to play records in which the impression groove is of the hill and dale type.

It further comprehends a novel construction of an offset stylus arm which is constructed in such a manner that it can be securely clamped to the stylus holder of the stylus lever to engage the inner and outer wall of the stylus holder.

It further comprehends a novel construction of an offset stylus arm which is provided at one end with an inwardly inclined shank serving as a fulcrum to force a portion of the arm against the outer face of the stylus holder when such shank is fastened in position within the stylus holder.

It further comprehends a novel construction of an offset stylus arm having novel means to clamp it to the stylus holder and novel means to secure with respect to it a jewel stylus.

Other novel features of construction and advantage will hereinafter more clearly appear in the detailed description of the invention.

For the purpose of illustrating my invention, I have shown in the accompanying drawings typical embodiments of it which are at present preferred by me, since they will be found in practice to give satisfactory and reliable results. It is, however, to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein set forth.

Figure 1 represents, in side elevation and partly in section, a sound box for a sound reproducing machine in conjunction with which an offset stylus arm, embodying my invention, is employed.

Fig. 2 represents a top plan view of the stylus arm seen in Fig. 1.

Fig. 3 represents an end view of the construction seen in Fig. 2.

Fig. 4 represents a top plan view of another embodiment of my invention.

Fig. 5 represents, in side elevation, the construction seen in Fig. 4.

Fig. 6 represents, in side elevation and partly in section, another embodiment of my invention.

Fig. 7 represents a top plan view of the construction seen in Fig. 6.

Fig. 8 represents, in side elevation, another embodiment of my invention.

Fig. 9 represents, in side elevation, another embodiment of my invention.

Fig. 10 represents a top plan view of the construction seen in Fig. 9.

Fig. 11 represents a top plan view of the construction seen in Fig. 8.

Similar numerals of reference indicate corresponding parts.

Referring to the drawings.

1 designates a sound box of any desired or conventional construction which is provided with a stylus lever 2 having the usual or conventional form of stylus chuck or holder 3 on one side of its pivot 4 and the chuck is provided in the usual manner with a set screw 5. 6 designates an off-set stylus arm, embodying my invention, as shown in Figs. 1, 2 and 3. The stylus 6 consists of a preferably metallic or other longitudinally extending member having a substantially straight enlarged head 7 from which extends longitudinally a laterally inclined portion 8 which at its free end is deflected upon itself as indicated at 9 and the juxtaposed faces are recessed as at 10 in order to receive the shank 11 which at its lower end carries the socket 12 in which is secured a jewel 13, the parts 11, 12 and 13 forming a jewel stylus. The deflected end 9 forms a spring arm to secure the shank 11 in its adjusted position. The head 7 is provided with an inclined shank 14 which is preferably polygonal in cross section and as illustrated is triangular. The head is recessed as at 15 and provided with an arm 16 which bears against the outer wall of the socket 3 in proximity to the pivotal support of the stylus lever 2.

When the shank 15 is inserted in the stylus holder 3 and the set screw 5 is tightened the clamping device formed by the shank 14 of the arm 16 causes the stylus to

be clamped against the inside and outside of the stylus holder 3 of the stylus lever 2 and it will be seen that the shank 14 acts as a fulcrum point to permit the arm of the head or frame 7 to be forced firmly against the outside of the stylus holder near its fulcrum point so that the sound vibrations pass directly from the point engaging the record diagonally through the frame to the outside point of contact with the stylus bar so that the sound vibrations pass to the stylus bar and to the diaphragm by the shortest path and do not have to pass through a long path formed by resilient or spring members.

Referring now to Figs. 4 and 5, 17 designates the body portion of an offset stylus arm one end of which is upwardly and inwardly deflected to form a shank 18 which is of polygonal contour in cross section and preferably triangular as shown. The forward end of the arm 17 is rearwardly deflected to form the spring arm 20 and the juxtaposed faces are recessed as at 19 to receive the shank 11 which carries the holder 12 for the jewel 13. The spring arm 20 is deflected upwardly and rearwardly and is provided with an inclined or rounded face which bears against the outer face of the stylus holder 3 when the shank 18 has been inserted in it and the set screw 5 tightened. If it is desired to adjust the shank 11 all that it is necessary to do is to insert a tool such as a knife or a screw driver between the spring arm 19 and the frame 17, adjust the shank 11, and then release the spring arm 20 so that the shank 11 will be firmly held in the offset stylus arm.

In Figs. 6 and 7, I have shown another embodiment of my invention in which the offset stylus 21 consists of a longitudinally extending bar which at one end is upwardly and inwardly deflected to form the polygonal shaped shank 22. The arm 21 at its opposite end is upwardly and rearwardly deflected as at 23 and then curves upwardly and longitudinally as indicated at 24. The arm 21 is provided with an aperture 25 which is presented in a direction at an angle to the direction of an aperture 26 in the spring arm 24. It will be apparent that in this embodiment of my invention when the shank 22 is inserted in the stylus holder 3 and the set screw 5 is tightened, the spring arm 24 will be pressed against the outer face of the stylus holder 3 and owing to the peculiar arrangement of the apertures 25 and 26, the shank 11 of the jewel stylus will be firmly secured in its adjusted position.

In the embodiment seen in Figs. 8 and 11, the offset stylus 27 consists of a longitudinally extending bar which is provided with an upwardly extending flange or plate 28 positioned at an angle thereto and having a projecting portion, the face 29 of

which is adapted to contact with the outer wall of the stylus holder 3 when the shank 30 which rises from the bar 27 at one end is secured in position by means of the set screw 5. In this case the shank 11 passes through the bar 27 and is threaded to receive a nut 31 and on opposite sides of the bar 27 are positioned the cork or other washers 32 and 33 respectively through which the shank 11 passes.

In the embodiment seen in Figs. 9 and 10, 34 designates the offset stylus arm the body portion of which is bent or twisted as at 35 and terminates at one end in the polygonal shaped shank 36 which inclines inwardly so that when the set screw 5 is tightened the projecting portion 37 of the frame will be pressed against the outer wall of the stylus holder 3. The forward end of the offset stylus arm is deflected upon itself, as at 38, to form a spring member, and the juxtaposed walls are recessed, as at 39, in order to receive the shank 11 of the jewel stylus.

If desired the shank 11 may be provided with a cork or other sleeve or coating 40 as will be understood by reference to Figs. 1, 2 and 3, and it can be used in a similar manner in the other embodiments shown. I do not, however, desire to be limited to the use of any coating or sleeve on the shank 11 as it may be dispensed with.

It will be apparent from the foregoing that in all the embodiments of my invention except that seen in Figs. 8 and 11, the stylus arm is provided with a spring member such as 9 in Figs. 1, 2 and 3, 20 in Figs. 4 and 5, 24 in Figs. 6 and 7, and 38 in Figs. 9 and 10, which serve as a spring clamp to retain the shank 11 in its adjusted position. All that it is necessary to do when it is desired to adjust the jewel stylus with respect to the stylus arm 6 is to press such spring outwardly, adjust the shank 11 and then release the spring arm so that the shank 11 and its adjuncts will be retained in their proper adjusted position.

The shank of the stylus point is thus retained in position by means of a spring clamping device or a spring loop and the stylus point is held in a laterally inclined position.

The offset stylus engages the inner and outer walls of the stylus holder and forms a strut connection with it when the set screw 5 is tightened.

In accordance with my present invention the stylus is provided with a shank such as 14 which inclines inwardly instead of being disposed at right angles to the longitudinal axis of the stylus. This renders it possible to simultaneously clamp the stylus to the inner and outer walls of the stylus holder 3.

If the shank such as 14 is positioned at right angles to the stylus bar it is of neces-

sity too small and flimsy to resist the bending action of the leverage to which it is subjected, while in accordance with my present invention the shank acts mainly as a fulcrum point to permit the frame of the offset stylus arm to be forced firmly against the stylus lever at a point near its fulcrum.

In the devices heretofore employed in this art for attachment to a sound box constructed to play lateral cut records, in order to enable it to play records of the hill and dale type, the construction employed has not produced the proper results since it has been limited in size and dimensions to the opening in the stylus holder. The result of this is that the prior devices have not had sufficient rigidity and stiffness to transmit the sound vibrations through the small shank which it was necessary to employ, in order to enable it to be secured to the stylus holder of a sound box for lateral cut records.

In accordance with applicant's device, the body portion of the offset stylus arm is constructed and secured with respect to the stylus holder in such a manner that it is rigidly connected with the stylus holder and any likelihood of any bending action of the stylus arm during the playing operation is positively prevented and the sound vibrations instead of passing to the stylus lever through the small shank, passes through to the body portion of the stylus holder in close proximity to the fulcrum point of the stylus lever.

I am thus enabled, when a construction is employed in accordance with my present invention, to obtain a much greater volume than has heretofore been attainable in devices of this character and I am also enabled to eliminate the chatter which has been heretofore present in devices of this character.

I am also enabled to reduce to a considerable extent the surface noise which has heretofore been present during the playing operation in devices of this character.

Attention is also directed to the manner in which the stylus is carried by the stylus arm so that it is positioned in an inclined floating position or in other words, at an angle to the median line of the stylus lever.

This position of the stylus materially aids in eliminating the surface noise.

I am aware that it has heretofore been proposed to secure the stylus arm to the outside of the stylus holder but such construction has many disadvantages.

If such prior device is left on the stylus holder when playing a lateral cut record,

the increased weight interferes with the proper playing result which is desired.

Such prior construction is not commercially practicable since it is necessary to adjust two clamping screws or their equivalents and it is impossible with such construction to obtain the results which are obtainable with my device.

It will now be apparent that I have devised a novel and useful construction of an offset stylus arm which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description and while I have, in the present instance, shown and described preferred embodiments thereof which will be found in practice to give satisfactory and reliable results, it is to be understood that such embodiments are susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

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

1. An offset stylus arm having means to engage the inside and outside of the chuck of the stylus lever.

2. An offset stylus arm having means to clamp against the inside and outside of a stylus holder to form a strut connection with it when the set screw of the stylus holder is tightened.

3. An offset stylus arm having means to engage the inside and outside of a stylus holder, and a stylus carried by said arm, said arm forming a spring clamping device to secure said stylus in adjusted position.

4. An offset stylus arm having means to engage the inside and outside of a stylus holder, and having a stylus receiving opening inclined with respect to the longitudinal axis of said arm.

5. In combination, a stylus holder and an offset stylus arm having a shank inclined toward the inner wall of the stylus holder and having means to engage the outer wall of the stylus holder, and securing means carried by the stylus holder to engage said shank and cause said means to clamp against the outer wall of the stylus holder.

6. A stylus arm having means at one end to form a strut connection with a stylus holder and its opposite end adapted to receive a stylus.

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Witnesses:

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C. D. McVAY.