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E. J. DOYLE  
MUSICAL INSTRUMENT

2,687,059

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2 Sheets-Sheet 2

Fig-3

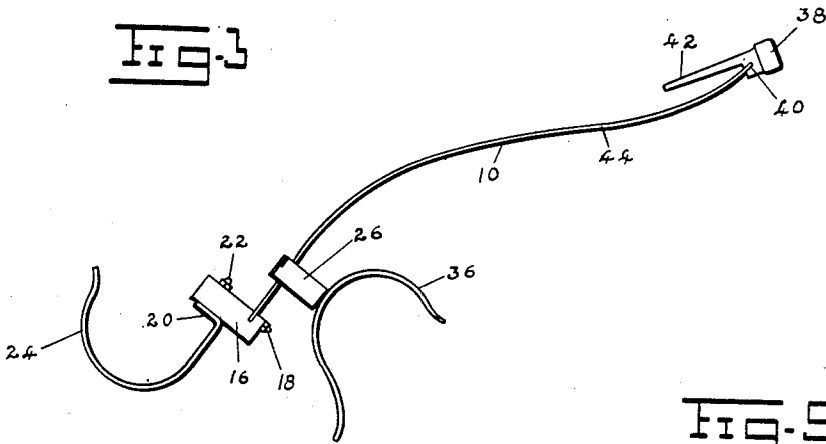


Fig-5

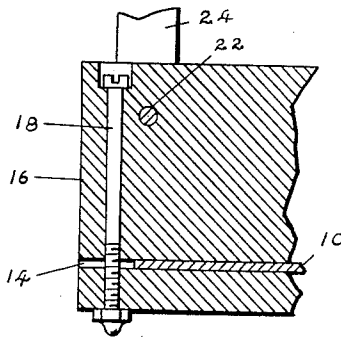


Fig-4

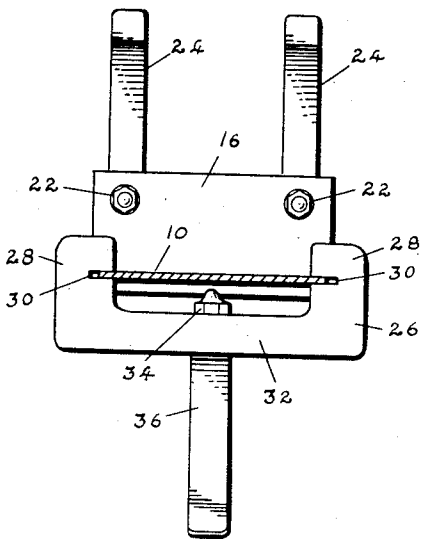
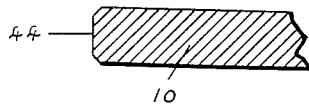


Fig-6



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# UNITED STATES PATENT OFFICE

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## MUSICAL INSTRUMENT

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7 Claims. (Cl. 84-402)

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The present invention relates to musical instruments and more particularly to the type in which a resonant metal body is vibrated while the player manipulates its tension to produce a scale of musical notes as in the well known "musical saw" where an ordinary carpenter's saw is variously bent and struck with a mallet or similar percussion device or otherwise vibrated. The general object of this invention is to provide a simple but improved instrument of this character that will be more convenient to hold and play and which will produce a larger range of musical notes of better quality than heretofore.

Another object is to provide an instrument of this character especially designed for use with a bow of the type employed with a violin and like stringed instruments.

A further object is to provide simple means for controlling the pitch.

These and other desirable objects are accomplished by the construction disclosed as an illustrative embodiment of the invention in the following description and in the accompanying drawings forming a part hereof, in which:

Fig. 1 is a plan view of a musical instrument constructed in accordance with and illustrating one embodiment of this invention;

Fig. 2 is a side or edge view thereof;

Fig. 3 is a side or edge view on a smaller scale showing the instrument with its parts in the positions assumed during the playing thereof;

Fig. 4 is a transverse section through the blade taken on the line 4-4 of Fig. 2 and looking in the direction of the arrows to show supporting parts in elevation;

Fig. 5 is an enlarged, fragmentary section taken approximately on the line 5-5 of Fig. 2; and

Fig. 6 is a greatly enlarged transverse section through the playing edge of the blade, taken substantially on the line 6-6 of Fig. 1.

The same reference numerals throughout the several views indicate the same parts.

Referring more particularly to the drawings, the major element of the instrument consists of a thin tapered, manually bendable tempered steel blade 10, both ends of which are preferably squared off at right angles to the playing edge 44. It is imperforate from end to end. The blade is held and manipulated by the player in the following manner, all direct supporting or holding parts or attachments being of a non-metallic material, such as wood, which has substantially different characteristics of elasticity and resilience from those of the metal blade and which, in the particular block-like shapes here employed, has little or no resonance, so that the direct attachments

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or holding parts do not greatly damp the vibrations of the metal blade and yet do not themselves vibrate to a sufficient extent to give rise to undesirable sounds of their own.

The butt or wider end of the blade has an abrupt reverse taper at 12, the extremity of which portion enters a kerf 14 in a cross bar 16 wherein it is tightly clamped by end bolts 18 which, it will be observed, are removed from contact with the blade which throughout, has no metal to metal contacts. The taper 12 enhances the bendability of the blade upon the cross bar as a supporting base and improves vibration. Secured to the opposite side of the cross bar base 16 at 20 as by bolts 22 are a pair of strap yokes 24. These are designed to fit under and partially around the right thigh of the player while in a sitting playing posture to resist upward tilting movement of the base as the projecting blade is depressed as is best understood from inspection of Fig. 3.

Adjacent to the cross bar 16 a little farther up the blade beyond the reverse taper 12, the blade is engaged by a bridge and auxiliary support 26 best shown in Figs. 1, 2, and 4. Its end blocks 28 have opposed inside kerfs 30 cut therein and are of proper width to firmly, frictionally grip the thickness of the blade 10 only at its edges, but yet permit the bridge to be forcibly adjustably moved along the blade within a limited range without disengagement. The connecting portion 32 of the bridge is well spaced from the under surface of the blade. Bolted centrally to the bridge at 34 is a single strap yoke 36 similar to the yokes 24 but designed to engage over and rest upon the top of the left thigh of the player and take downward pressure resulting from depression of the blade 10.

At the extreme tip or narrow end of the blade, there is provided a handle for the left or fretting hand of the player. It consists, in the present embodiment, of a projecting block 38 in the inner side of which is a kerf or slot 40 in which the blade tightly wedges without the aid of other fastening means. Projecting from the block above the slot and extending longitudinally down the blade at a rising angle to its normal flat plane, is a tongue 42.

In operation, the player adjusts the leg yokes 24 and 36 as described, engages the fingers of his left hand beneath the block 38 and with the thumb of the same hand pressing down on the tongue 42 bends and flexes the blade while tapping it with a small mallet or, preferably, drawing a bow across its edge to produce the musical notes. Because of the leverage afforded by the

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handle 38 the double curvature illustrated in Fig. 3 may readily be attained, greatly increasing the range of notes, while at the same time contributing to greater precision and spacing in the notes produced. But also neither the hand nor any other part of the player's body touches the blade to mute or damp the tones. To alter and refine the pitch the bridge and auxiliary support 26 is adjusted as described.

While the use of a percussion mallet has been suggested, the use of a violin bow or the like is greatly preferred because of the following additional feature of this invention.

The ordinary musical saw is, as a toothed cutting tool, usually stamped out of a steel strip with its longitudinal extent running at right angles to or across the roll, grain, and finish originating at the steel mill, or sometimes with the longitudinal center line of the saw blade parallel to the roll, grain, and finish of the steel strip. As distinguished from this, the present blade 10 is sheared from the steel strip in such orientation thereto that the playing edge 44 (that is, the edge farthest from the body of the player when the instrument is held in the preferred manner above described) is exactly parallel to and in the direction of the roll, grain, and finish of the steel strip coming from the steel mill. In addition, this playing edge is nicely honed or stoned to a slight bevel as indicated to a somewhat exaggerated extent, particularly in Fig. 6. The result is that the present instrument may be played with sweeping strokes of the bow (preferably with the hairs reversed) to produce long, even notes of high quality and tone value rather than the short, scratchy tones which would result from the playing of a conventional musical saw by means of a bow, especially since a bow, if usable at all on a conventional musical saw, is confined to rather short harsh strokes, because of the relatively rough or unfinished edge of the saw as compared with the finely finished and honed playing edge of the present blade. Furthermore, the quality of vibration is the same at whatever point along the edge 44 the blade is stroked.

Because of the features and refinements described, the practice of this invention results in the production of a real playing instrument with a range of two and a half octaves instead of the eight or ten notes produced on a musical saw, and approaching the range of the human voice; the instrument produces at times a type of overtone which does not interfere with pitch but results in a very pleasing effect similar to the whistling or singing of a bird; and, in general, the improvements effect and provide for proper spacing of notes and control of vibration, pitch and tone.

It is seen from the foregoing disclosure that the above mentioned objects of the invention are admirably fulfilled. It is to be understood that the foregoing disclosure is given by way of illustrative example only, rather than by way of limitation, and that without departing from the invention, the details may be varied within the scope of the appended claims.

What is claimed is:

1. A musical instrument embodying a thin and laterally tapered manually bendable steel blade having one longitudinal edge honed to a slight bevel to take the friction of a violin-type bow, the grain and surface finish of the blade being parallel with said edge.

2. A musical instrument embodying a thin,

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tapered, manually bendable steel blade having a non-resonant base support at its wider end and a similar auxiliary support adjacent thereto and connected therewith only through the medium of the blade itself, said auxiliary support being slidable along the blade independently of said base support to vary the distance between the two supports, each of said supports having a concave portion for engaging and partially encircling one thigh of a player, the concave portions of the two supports being faced approximately in opposite directions whereby the concave portion of said base support may engage under one thigh and the concave portion of said auxiliary support may engage over the other thigh of a player in sitting position.

3. A musical instrument in accordance with claim 2, in which the said auxiliary support constitutes a bridge slotted to closely engage only the opposite longitudinal edges of the said blade.

4. A musical instrument embodying a thin, tapered, manually bendable steel blade having a non-resonant cross bar clamped to its wider butt end at right angles to its median line and provided with a pair of spaced yokes adapted to engage beneath one thigh of a player and a bridge having a limited slidable adjustability on the longitudinal edges of the blade adjacent to the cross bar and in parallelism thereto, said bridge being provided with a yoke adapted to rest upon the top of the other thigh of the player.

5. A musical instrument in accordance with claim 4, in which both edges of the wide end of the said blade have an abrupt reverse taper symmetrically drawn from both edges extending a relatively short distance anteriorly and exteriorly of the cross bar and the narrower tip of the blade is provided with a finger piece in alignment with the median line of the blade.

6. A construction as defined in claim 5, in which said finger piece on the narrower tip of the blade comprises a non-metallic block having a slot for tightly receiving said narrower tip of the blade to retain the block frictionally on the blade and having an integral substantially straight tongue-like extension extending toward the opposite end of the blade approximately parallel thereto at a slight diverging angle therefrom, said finger piece being completely free from all metal except said blade in contact therewith.

7. A construction as defined in claim 4, further including a finger piece made entirely from a single integral piece of non-metallic material and having a slot for tightly receiving and clamping on the narrower end of said blade and having a substantially flat and straight tongue-like extension extending lengthwise of the blade spaced from and approximately parallel to one face of the blade.

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