(No Model.)

W. MUNROE.

METALLIC REED FOR MUSICAL INSTRUMENTS.

No. 254,882. Patented Mar. 14, 1882.

Fig. 1.

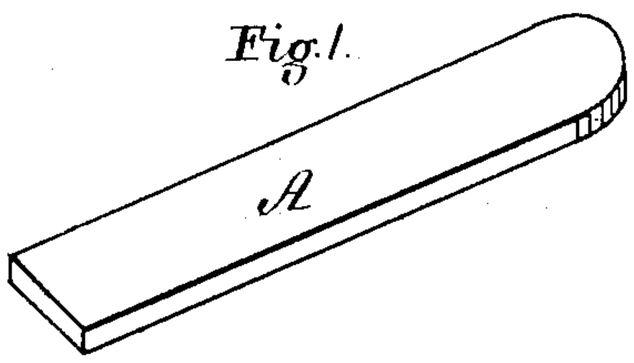


Fig. 2.

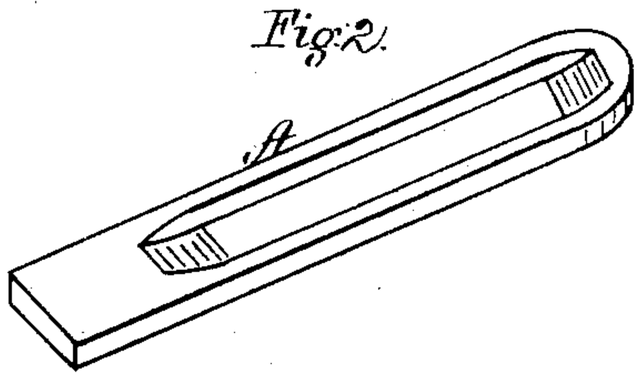


Fig. 3.

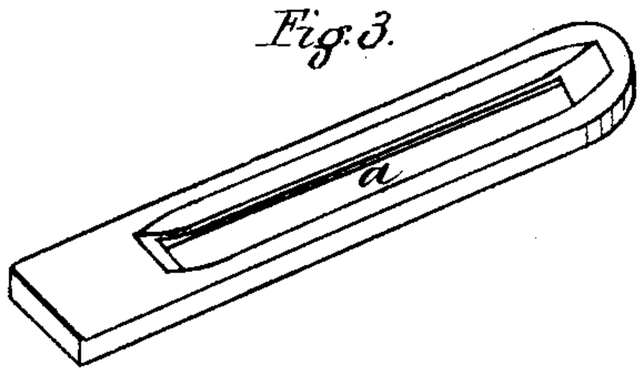


Fig. 4.

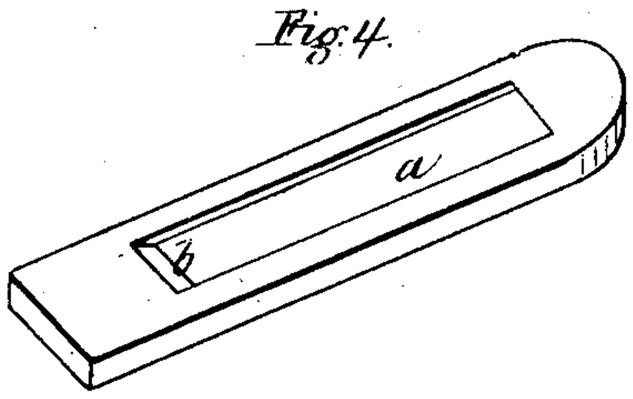


Fig. 5.

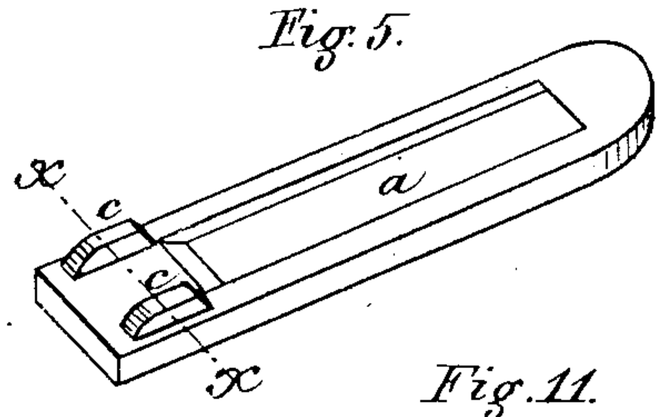


Fig. 6.

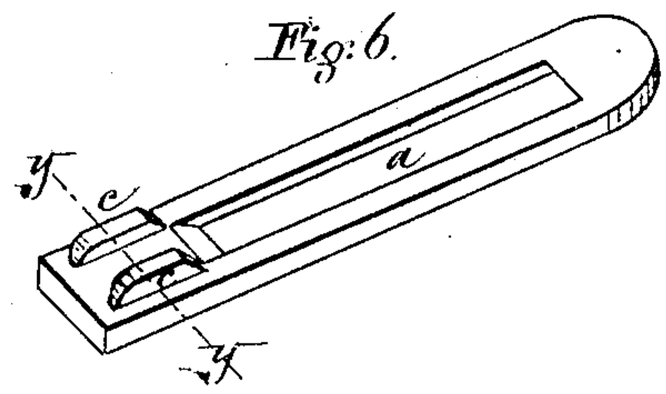


Fig. 7.

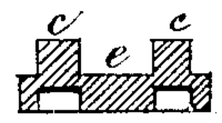


Fig. 8.

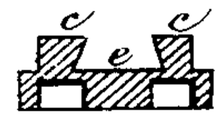


Fig. 9.

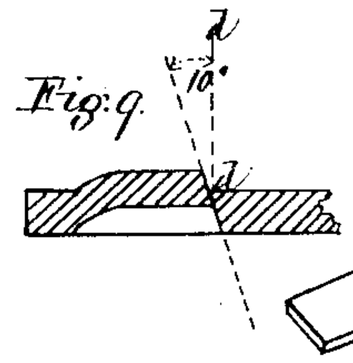


Fig. 10.

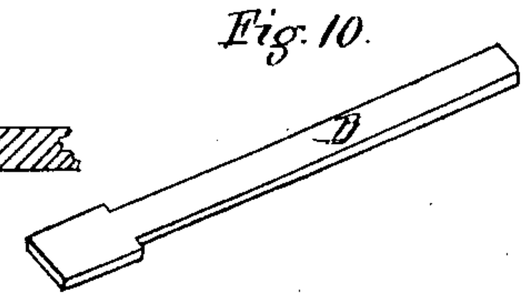


Fig. 12.

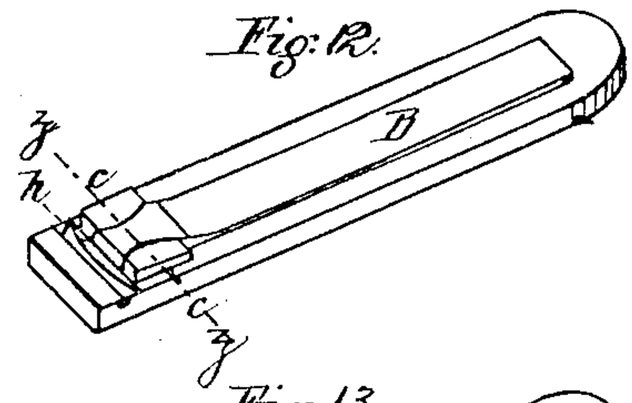


Fig. 13.

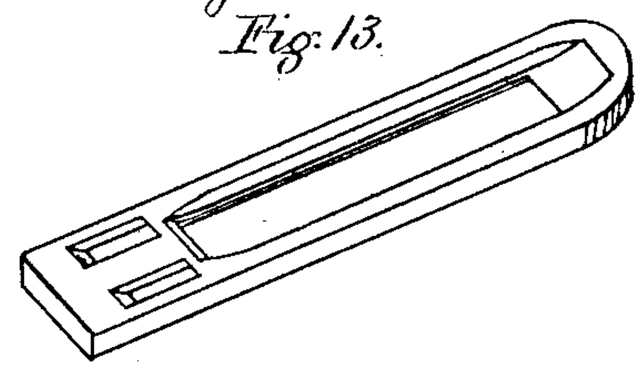


Fig. 14.

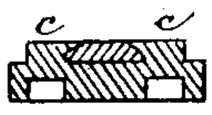


Fig. 15.

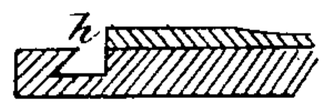
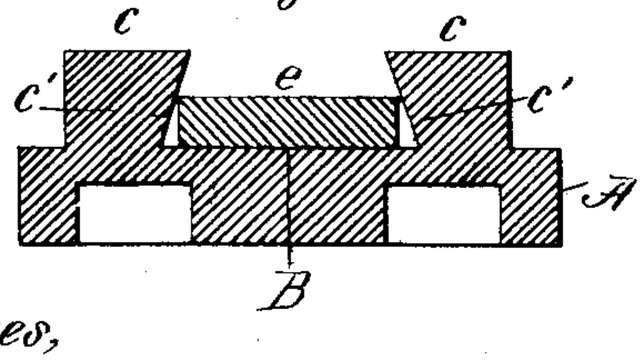


Fig. 11.



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C. M. Morris

Inventor,
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pr Norman W. Stearns,
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM MUNROE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE MUNROE ORGAN REED COMPANY, OF SAME PLACE.

METALLIC REED FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 254,882, dated March 14, 1882.

Application filed April 9, 1881. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MUNROE, of Worcester, in the county of Worcester and State of Massachusetts, have invented certain Improvements in Metallic Reeds for Musical Instruments, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figures 1, 2, 3, and 4 are perspective views, representing the several stages in the construction of a reed-plate for musical instruments. Fig. 5 is a view of the reed-plate with two projections struck up from its under side in accordance with my invention. Fig. 6 is a view of the same finished for the reception of the heel of the tongue, the inner faces of the projections of the reed-plate being inclined to form a dovetail channel between them. Fig. 7 is a transverse section, on the line *x x* of Fig. 5, enlarged. Fig. 8 is a transverse section, enlarged, on line *y y* of Fig. 6. Fig. 9 is a longitudinal section of Fig. 6, enlarged, showing the form of the front end of each projection. Fig. 10 is a perspective view of the tongue of the reed. Fig. 11 is a transverse section, enlarged, showing the heel of the tongue in place between the finished projections before being secured to the reed-plate by pressure. Fig. 12 is a perspective view of the upper side of a finished reed with my improvements applied thereto. Fig. 13 is a view of the under side of the same. Fig. 14 is a transverse section, enlarged, on the line *z z* of Fig. 12. Fig. 15 is an enlarged transverse section through the rear end of Fig. 12, showing the form of the groove in the upper side of the reed-plate to enable the point of the withdrawing-hook to engage therewith.

To insure the complete, unrestrained, and natural vibration of the tongue of a musical reed—absolutely essential to the production of a clear, pure, and unbroken tone—it is necessary that the entire surface of the heel or fixed portion of the tongue should have a solid permanent bearing upon that part of the reed-plate at the rear of the slot in which the tongue vibrates.

To practically succeed in accomplishing this result with the least labor and expense is the object of my present invention, which consists, first, in a metallic reed-plate provided with projections formed by striking up its under side, the forward end of each projection being inclined at an angle of about ten degrees (10°) to the rear of a vertical line passing through its lower extremity, the cavity or indentation produced on under side of the plate in striking up such inclined projection being of a dovetail form, in order that the metal of the walls thereof may be so wedged and condensed that it cannot be forced off or separated from the contiguous metal of the plate, the projections being thus effectually locked or tied thereto and endowed with the requisite degree of strength to perform its office in holding the reed, which cannot be so reliably obtained by striking up the projections at right angles to the plate as heretofore.

My present invention consists, secondly, in inclining or beveling outwardly and downwardly the channel between the projections of a reed-plate for the reception of and in combination with the tongue, the heel of which is rectangular in cross-section when entered within the channel, the width of said channel at a point on a level with the top of the heel of the tongue being equal to that of the top of the tongue, and the width of the bottom of the channel being greater than the width of the base of the heel, its upper edges only coming into contact with the inner faces of the projections when the heel is located in place, in order to properly guide the vibrating portion of the tongue, the labor of beveling off the edges of the heel being dispensed with, by which construction, when the projections are upset or flattened down thereover, the stock or material at the vertical edges of the heel is spread out laterally into the corners of the dovetail channel, and some of the metal of the projections also squeezed down therein, the bond thus formed being as strong and solid as though the parts were homogeneous.

To enable others skilled in the art to understand and use my invention, I will proceed to describe the manner in which I have carried it out.

From a piece of sheet metal, preferably brass, I punch out a blank of the form and size desired for the reed plate A, which, after being planed, Fig. 1, is milled out on its under side, (see Fig. 2,) and then provided with a longi-

tudinal slot, *a*, Fig. 3, for the free end of the tongue B to vibrate therein when under the influence of an air-current produced by the movement of the valve (not shown) thereunder, the width of the portion of the under side of the reed milled out being greater and exceeding in length that of the said slot in order to insure the free escape of air, and thereby prevent a muffled sound, which would otherwise be produced. The upper surface of the reed-plate at the rear of the slot *a* is now slightly beveled off at *b* down toward the slot, in order to prevent the rear of the vibrating portion of the tongue from coming into contact therewith. (See Fig. 4.) Next, by suitable dies and punches operated by a press or otherwise, I strike up or displace from the under side of the reed-plate two projections, *c c*, Fig. 5, each located a short distance inside of and equidistant from the contiguous edge of the plate, the forward end of each projection being in this operation made to incline at an angle of about ten degrees (10°) to the rear of a vertical line passing through the bottom of the forward end of said projection, for a purpose presently to be explained. The inner face of each projection *c* is now planed or cut away, so that the sides of the channel *e* between the two projections *c c* will incline or dovetail outward at their bottoms, Fig. 8, and the width of the channel at its bottom will exceed the width of the rectangular heel of the tongue, the width of the channel on a level with the upper surface of the heel conforming exactly to the width of the latter, the thickness of the heel being preferably about one-half the height of a projection. The operation of beveling the edges of the heel of the tongue is avoided, and after being located in its channel *e*, between the two projections *c c*, pressure is applied to flatten them down thereover, the spaces *c' c'* at the bottom of the channel at each side of the base of the heel being in this operation partially filled by some portion of the material of the projections, and partially by the material at the vertical edges of the heel, which is squeezed out laterally into said spaces, making the bond or union between the pieces as strong and permanent as though they were integral.

The object of inclining the forward end of each projection to the rear is to insure a greater degree of strength and to preserve the cohesion and continuity of the parts, and for this purpose the die is of such form, and the position of the plate with respect to the die is such, that a dovetail cavity is formed in the under side of the plate in order that the metal in the projection and contiguous sides of the plate may be wedged and condensed, which prevents the forward end of the projection from being separated or forced off its seat during the striking-up process, and also when upset over the heel of the tongue, said construction securely locking and tying the parts together, which results could not be relied on were the projections struck up at right angles, as heretofore.

The solid and permanent union between the plate and heel of the tongue produced by the application of my invention successfully prevents any movement of the heel of the tongue on its seat from air-currents or other cause, the result of which is a clear, brilliant, perfect tone is emitted by the vibrations of the free end of the tongue.

Instead of forming projections with their forward ends inclined at angles of about ten degrees, (10°,) as described, the reed-plate may be provided with two projections in which the forward end of each is at right angles to the upper side of the plate; but with these and other descriptions of projections I prefer to bevel their inner faces in order to form a dovetail channel between them, the width of the bottom being greater than the width of the bottom or base of the heel, so as to leave an open space on each side thereof, the width of the upper surface of the heel coinciding exactly with the width of the channel at this point, as thereby I form a stronger and more permanent attachment, and for the same reason I prefer to strike up the projections with their forward ends inclined, as described.

The depression or groove *h* in the upper side of the reed-plate is to enable a hook to take hold of a reed when it is to be withdrawn. I remove (with a rotary cutter) a portion of the upper side of the metal at the rear of the projections and transversely with the reed-plate, so as to give to the rear face of the depression or groove an inclination or bevel downward and to the rear—*i. e.*, making the width of the bottom of such depression greater than at its top, Fig. 15, by which means the slipping of the hook incident to the use of a reed provided with a projection, or with a groove having a vertical rear face for this purpose, is avoided.

The angle of the inclination of the forward end of each projection may be varied somewhat without departing from the spirit of my invention, and the width of the tongue may be the same throughout its entire length.

In this application I do not claim the groove *h* in Fig. 15, but propose to apply for a separate patent for said device.

Having described my invention, what I claim is—

1. A metallic reed for musical instruments, consisting of the slotted reed-plate A, provided with projections *c c*, the forward end of each projection being inclined at an angle of about ten degrees (10°) to the rear of a line passing vertically through its lower forward end, in combination with the tongue B, secured on its seat between said projections by upsetting or flattening them down thereon, substantially as described.

2. As an improvement in metallic reeds for musical instruments, a reed-plate provided with the two projections on its upper side, having a dovetail groove or channel between them of such size and form as to receive the rectangular heel of a tongue whose upper edges only fit or come into contact with the sides of the

channel, in order thereby to guide the free or vibrating portion of the tongue in line with the slot in the plate, a space being left in the channel at its bottom, on each side of the heel, whereby when pressure is applied to said projections the heel of the tongue will be upset and expanded into said spaces, and the metal of the projections for welding or uniting the plate and tongue also closed down therein to insure a solid and permanent bond or union between them, which will preclude the possibility of any movement or vibration of the heel in or upon its bed or seat, as set forth.

Witness my hand this 31st day of March, 1881.

WILLIAM MUNROE.

Witnesses:

GEORGE H. BALL,

JOSIAH A. RICE.