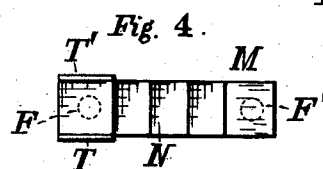
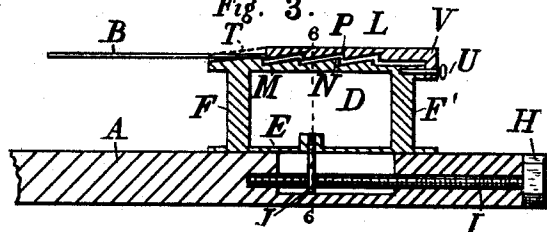
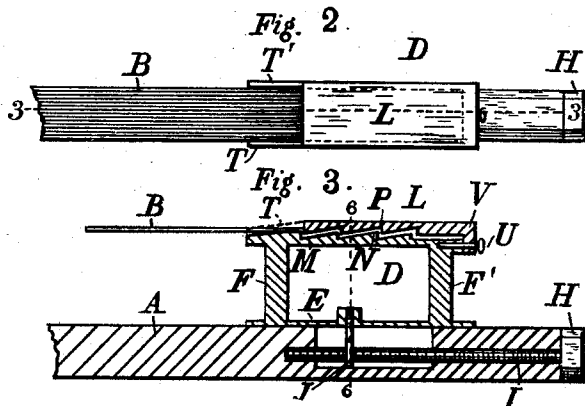
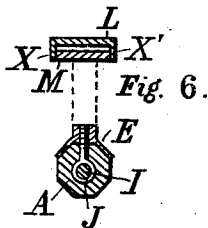
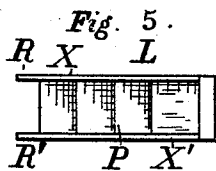
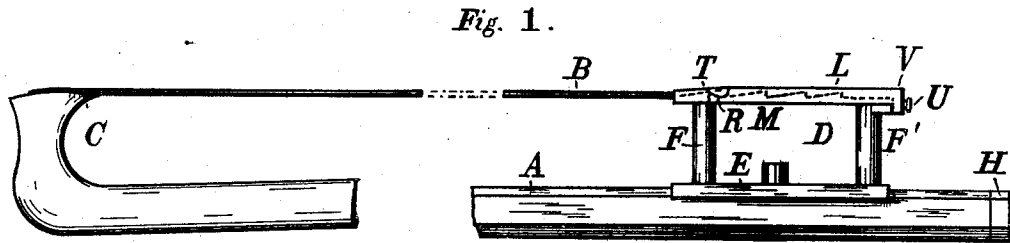


(No Model.)

J. A. HOULIHAN.
VIOLIN BOW FROG.

No. 485,038.

Patented Oct. 25, 1892.



Witnesses:
C. F. Crannell.
R. L. Osgood.

Inventor:
John A. Houlihan.
By Geo. B. Selden.
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UNITED STATES PATENT OFFICE.

JOHN A. HOULIHAN, OF ROCHESTER, NEW YORK.

VIOLIN-BOW FROG.

SPECIFICATION forming part of Letters Patent No. 485,038, dated October 25, 1892.

Application filed February 26, 1892. Serial No. 422,831. (No model.)

To all whom it may concern:

Be it known that I, JOHN A. HOULIHAN, a citizen of the United States, residing at Rochester, in the county of Monroe, in the State of New York, have invented certain Improvements in Violin-Bow Frogs, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improved construction of violin-bow frogs, whereby the attachment of the hair is facilitated and such devices rendered cheap and durable.

My improvements are fully described and illustrated in the following specification and the accompanying drawings and the novel features thereof specified in the claims annexed to the said specification.

In the accompanying drawings, representing my improvements, Figure 1 is a side view of a violin-bow. Fig. 2 is a plan view of the hand end of the same. Fig. 3 is a central longitudinal section on the line 3 3, Fig. 2. Fig. 4 represents the top plate of the frog. Fig. 5 represents the clamping-plate detached, as seen from the inner side. Fig. 6 is a transverse section on the line 6 6, Fig. 3.

In the accompanying drawings, A represents the rod or stick of the bow; B, the hair; C, the tip, and D the frog. The frog is made adjustable lengthwise of the stick at its hand end by means of the screw I, thumb-nut H, and eyebolt J, which is inserted into a suitable boss on the plate E of the frog. The plate E is given a shape corresponding with that of the stick, so that it may slide freely thereon for the purpose of straining or tightening the hair. From the plate E arises the standards or posts F F', which carry the top plate M of the frog.

L is a clamping-plate, which clamps the hair between its inner surface and the outer surface of the top plate M. At its inner end the clamping-plate is provided with the projecting hooks R R', which engage in suitable recesses in the flanges T T' on the top plate. At

its outer end the clamp is attached to the top plate by a pin U or other suitable device.

In the construction shown the clamp is provided with a lip V, through which the pin U passes into a hole in the top plate. The clamp is provided with ribs or flanges X X' along its edges, which hold the hair in place laterally. The top plate M is provided with a series of notches or toothed recesses N, and the clamp is provided with a corresponding series of similar notches P, so that the hair between the two plates is bent or clamped in such a way as to prevent its slipping. The top plate M is provided with the flanges T T', which serve to keep the hair in place, and at the same time, as their outer edges are inclined, as represented in Fig. 1, they prevent injury to the strings of the violin by the clamp-plate.

The clip C is of any ordinary or preferred construction and it is provided with any suitable means of attachment for the hair.

By my improvement the replacing of the hair in the bow is very much facilitated and the strength and durability of the bow is increased.

I claim—

1. The combination, with the bow, of the hair-clamp D, consisting of the notched plate M, the notched clamp-plate L, and means for attaching the plates to each other, substantially as described.

2. The combination, with the bow, of the notched plate M, having inclined flanges T T', the notched clamp-plate L, and means for attaching the plates together, substantially as described.

3. The combination, with the bow, of the notched plate M, the notched clamp-plate L, provided with hooks R R', and the pin U, substantially as described.

JOHN A. HOULIHAN.

Witnesses:

GEO. B. SELDEN,
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