(No Model.) 2 Sheets—Sheet 1.

G. W. BOWERS.

GUITAR.

No. 383,275. Patented May 22, 1888.

FIG. I.

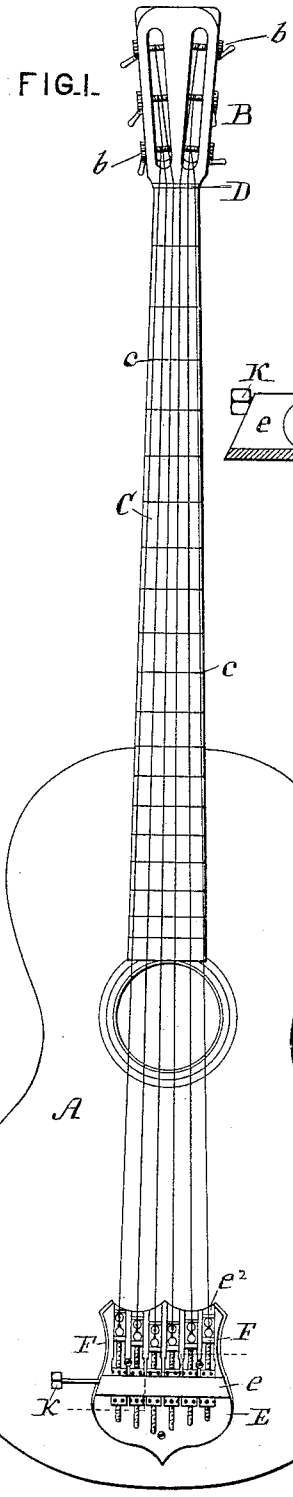


FIG. II.

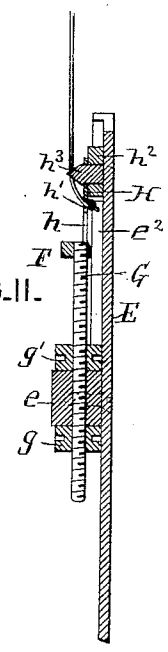
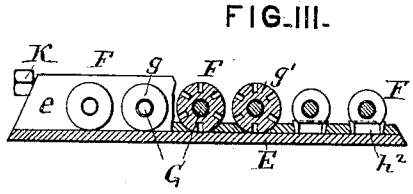


FIG. III.



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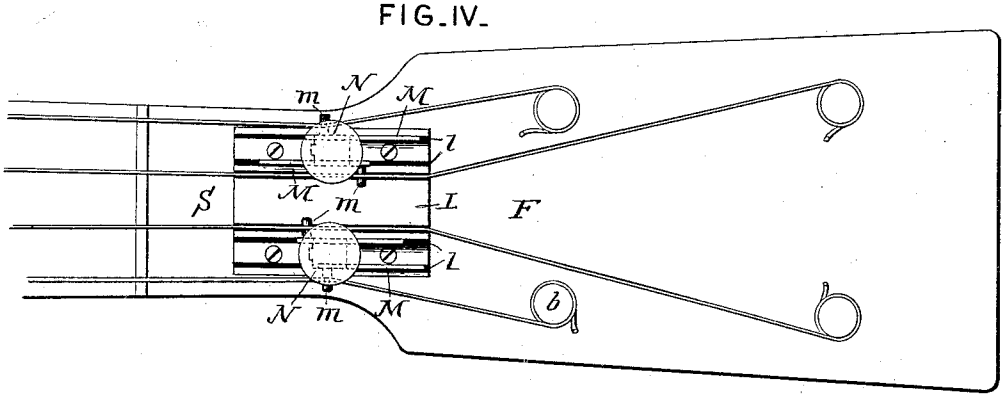
(No Model.) 2 Sheets—Sheet 2.

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GUITAR.

No. 383,275. Patented May 22, 1888.

FIG. IV.



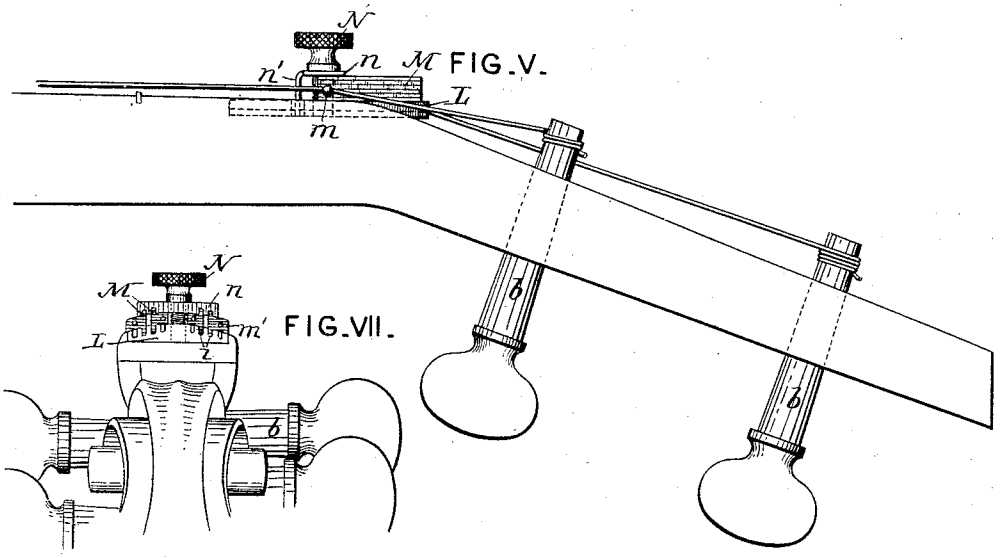
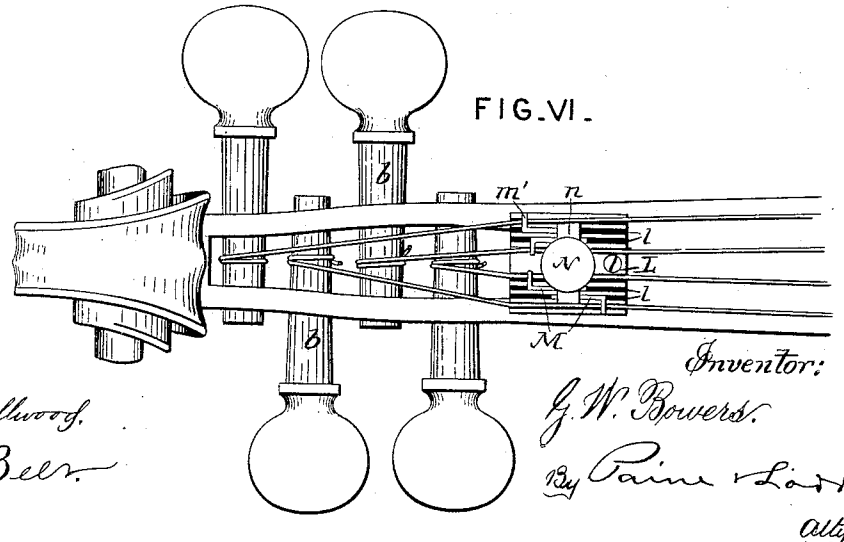


FIG. VI.



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UNITED STATES PATENT OFFICE.

GEORGE W. BOWERS, OF SOMERVILLE, MASSACHUSETTS.

GUITAR.

SPECIFICATION forming part of Letters Patent No. 383,275, dated May 22, 1888.

Application filed March 23, 1886. Serial No. 196,266. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. BOWERS, a citizen of the United States, residing at Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Guitars and like Musical Instruments; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to an improved method of tuning the strings of musical instruments of the class of guitars and violins—that is, those in which each string, by fingering or otherwise, is made to produce several notes.

Prior to my invention all musical instruments of this character have been constructed with two bearings, between which the strings are stretched. These bearings are non-adjustable, and the vibrating portion of each string is of a fixed length. Each string is tuned to a certain note by means of a screw, tuning-peg, or other tuning device, and the intermediate notes are produced by fingering the strings and thus shortening the vibrating portions thereof.

Guitars and other similar musical instruments have frets upon the finger-board, which indicate where each string must be pressed to produce certain intermediate notes; but these frets are also stationary and not adjustable, and, consequently, in stringing or tuning a guitar, it is found that nearly, if not all, of the strings give imperfect tones at certain frets and positions. This is most noticeable when new strings are put on after others break, and the difficulty has been partly overcome by averaging the strings and positions; but when the strings are stretched between two fixed bearings and the finger-board is provided with stationary frets it is impossible to tune the instrument perfectly. Thus when a new string is put into a guitar and tuned to the desired pitch it does not follow that because the open string is right the intermediate tones will also be correct. Sometimes turning the string end for end will improve it, or a piece may be cut off from one end and the vibrating portion thus formed of a different portion of the string; but these methods of correcting the evil are all uncertain and unsatisfactory.

The difficulty in tuning being caused by the stationary bearings and frets, I have found that by increasing or decreasing the distance between the bearings of each string separately the instrument can be perfectly adjusted to each and every string, and will give the correct tone at every fret.

In the case of violins or instruments which do not have frets the evil is not so serious, as it is corrected in fingering, but still it causes inequalities in the fingering and requires greater skill to produce true tones.

My invention therefore consists in providing means whereby the vibrating length of each string can be altered and adjusted independent of the other strings, this adjustment being supplementary to and separate from the usual means of tuning. This result may be secured in several ways, and I will describe two methods of accomplishing it; but I do not limit myself to any special mechanism, as it will be readily perceived that the result can be accomplished in many different ways.

In the accompanying drawings, Figure I shows a guitar with an adjustable bridge, to which the strings are attached, and Figs. II and III are longitudinal and transverse sections of the adjustable bridge. Figs. IV to VII illustrate a form of the invention wherein the supports for the strings on the head of the finger-board are made adjustable, the strings not being attached to the device, Figs. IV and V showing plan and side views of the head of a banjo provided with the device; and Figs. VI and VII, plan and end views, respectively, of a violin-head.

In the figures illustrating the first form of the invention, A is the body of a guitar, and B the head, provided with the customary tuning-pegs, *b*.

C is the finger-board, provided with a series of frets, *c*, in the usual manner.

D is the bearing for the strings at the end of the finger-board, over which the strings pass, and in place of a bridge, bearing, or tail-piece, as commonly employed, I provide an adjustable bridge, to which the ends of the strings are attached. This adjustable bridge consists of a base plate or block, E, which is

attached to the instrument, and which carries a series of adjustable devices, F, one for each string, by means of which the length of the vibrating portion of each string can be independently adjusted. Each of these adjustable attachments F has a screw-threaded shank, G, which passes through a hole in the bar *e*, projecting from the base-plate, and is provided with adjusting and clamping nuts *g g'* on opposite sides of the bar, and with a head-plate, H, having a hole, *h*, with a slot, *h'*, for the attachment of the string. Each head-plate H is attached to a block, h^2, which rests upon the base-plate E and can slide in a groove, e^2, formed therein. A bearing, h^3, for the string is provided in front of the point where the string is attached and directly over the block h^2. In the present case this bearing consists of a tooth, h^3, inserted into the block H^2 and allowed to project through a hole in the plate H. This construction gives a direct connection between the string and the body of the guitar, and it prevents the plate H and its screw from turning.

The blocks h^2 and their grooves are both made slightly tapering in vertical cross section to secure a positive contact between the blocks and the base-plate. A pin, K, or other tool for turning the nuts is provided, and in order that it may be always at hand it can be carried in a socket made in the end of the bar *e*.

To attach a string, a knot in the end of the string is passed through the hole *h*, and the string is then drawn into the slot *h'*, the string passing over the bearing h^3 and resting in a notch therein. The manner of manipulating the nuts to lengthen or shorten a string will be readily understood.

The modification of the invention illustrated by Figs. IV to VII forms adjustable bearings for the ends of the strings next to the tuning-pegs, and it is specially designed for banjos, violins, and also that style of guitars which have, like them, an ordinary bridge and tail-piece. It may also be employed in guitars of the style shown in Fig. I in connection with a common bridge.

L is a plate attached to the finger-board and having grooves *l* for the slides M, one for each string. The slides M in Figs. IV and V have each a pin or projection, *m*, forming a bearing for its string, while in Figs. IV and VII the string passes through a hole in a lug, *m'*, in the side of its slide. The slides are held in place when properly set by means of one or more clamp-screws, N, which bear upon plates *n*, resting upon the top of the slides M. In Figs. IV and V two screws, N, are shown, each placed between two slides, and each clamp-plate *n* has a prong, *n'*, that extends down into a hole in the base-plate L to prevent the plate from turning. In the device as shown in Figs. VI and VII one clamp-plate and screw hold all the slides, and the clamp-plate has grooves on its under side, into which the slides project.

The letters S and F in Fig. IV indicate the direction in which to move the adjustable bearings in order to make the string sharp or flat, as desired.

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

1. In a stringed musical instrument, an additional adjustable tuning device for changing the vibrating length of each string independent of the other strings and of the usual means for tuning the strings, substantially as and for the purpose set forth.

2. In a stringed musical instrument, an adjustable tuning-bearing for one end of the vibrating portion of the string, the same being independent of the other strings and of the usual means for tuning the string, substantially as and for the purpose set forth.

3. A compound bridge or bearing for guitars or like musical instruments, the same consisting of a series of adjustable attachments in addition to and independent of the usual tuning devices, so that the virtual or vibrating length of each string may be separately varied, substantially as and for the purposes set forth.

4. A compound bridge or bearing for guitars or like musical instruments, the same consisting of a series of bearings or supports for the strings, to which the strings may or may not be attached, each support being independently adjustable in the direction of the string, the said devices being in addition to the usual tuning devices, whereby the length of the vibrating portion of each string can be varied, as and for the purpose set forth.

5. The herein-described bridge for guitars or like musical instruments which have tuning devices for the strings, the same consisting of a device provided with adjustable attachments independent of the tuning devices, to which the strings are connected, so that the length of each string may be separately varied, for the purpose set forth.

6. In a stringed musical instrument, the combination of a stationary bearing for supporting the strings at one end, together with tuning devices for the strings, a finger-board having fixed frets thereon, and a bridge provided with adjustable bearings or supports for the strings, substantially as and for the purposes set forth.

7. In a stringed musical instrument, the combination of a stationary bearing for supporting the strings at one end, together with tuning devices for the strings, a finger-board having fixed frets thereon, and a bridge provided with adjustable bearings or supports for the strings, and means for locking the adjustable bearings, substantially as and for the purpose set forth.

8. In a bridge for guitars or like musical instruments, an adjustable device having means for the attachment of a string and a bearing for the string in front of the point of attachment, substantially as and for the purpose set forth.

9. In a bridge for guitars or like musical

instruments, the combination, with the base plate or block having the projection *e*, of one or more screws, G, passing through the projection, each having one or more adjusting-nuts, and a head provided with means for the attachment of a string, together with a bearing, h^3, for the string, and a block, h^2, substantially as and for the purpose set forth.

10. In a bridge for guitars or like musical instruments, the combination, with the base plate or block having one or more grooves in its upper face, of a corresponding number of bearings for the strings sliding in the grooves, together with means for locking each bearing when adjusted, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. BOWERS.

Witnesses:

HENRY W. WILLIAMS,

J. M. HARTNETT.