

(No Model.)

H. J. HANSEN.  
MUSICAL INSTRUMENT.

No. 459,932.

Patented Sept. 22, 1891.

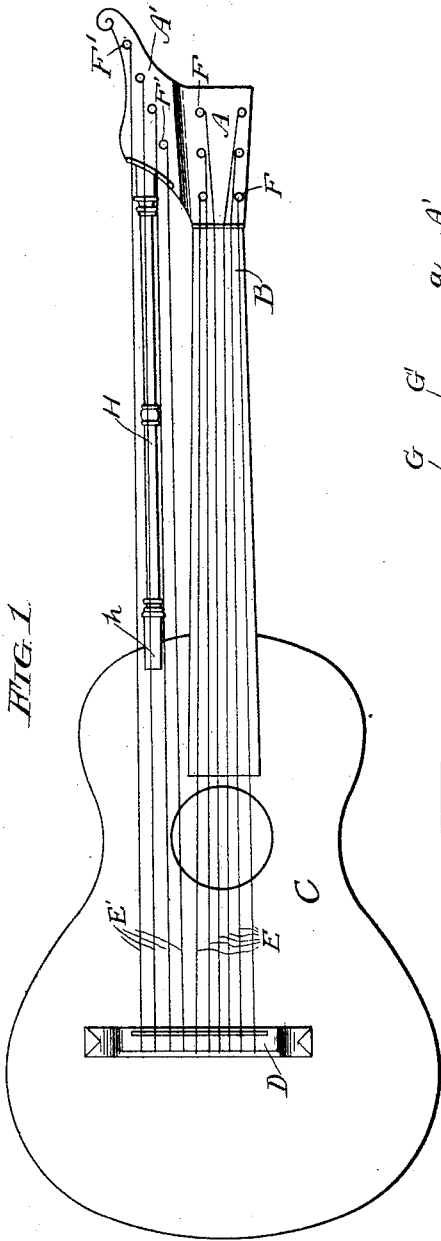


FIG. 1.

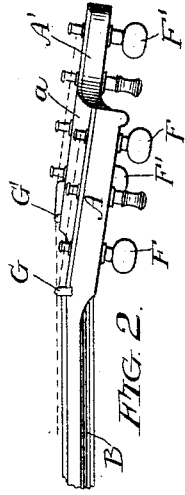


FIG. 2.

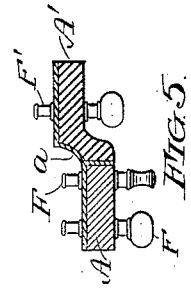


FIG. 5.

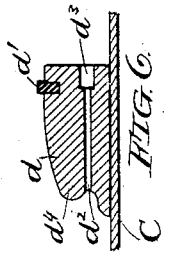


FIG. 6.

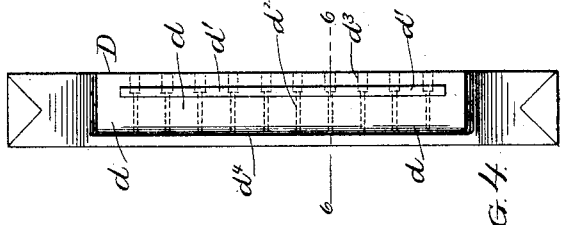


FIG. 4.

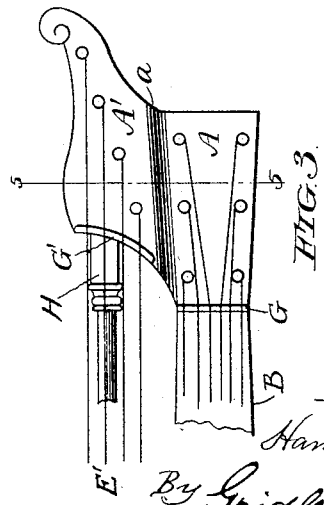


FIG. 3.

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# UNITED STATES PATENT OFFICE.

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## MUSICAL INSTRUMENT.

**SPECIFICATION** forming part of Letters Patent No. 459,932, dated September 22, 1891.

Application filed February 3, 1891. Serial No. 379,962. (No model.)

*To all whom it may concern:*

Be it known that I, HANS J. HANSEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification, reference being had to the accompanying drawings, which are made a part hereof, and in which—

10 Figure 1 is a plan view of a "harp-guitar" embodying the invention. Figs. 2 and 3 are respectively a side elevation and a plan view of the head on a larger scale. Fig. 4 is a plan view of the bridge on a larger scale.  
15 Fig. 5 is a transverse section of the head on a larger scale; and Fig. 6 is transverse section of the bridge on the line 6 6, Fig. 4.

The present invention consists in certain features of novelty that are particularly pointed out in the claims hereinafter.

Referring to the drawings, A represents the head; B, the neck, having the finger-board on the top side thereof; C, the sounding-board; D, the bridge, and E the six strings customarily used on guitars. In order to attach the strings to the body of the guitar, it has heretofore been the practice to form key-hole openings through the bridge from top to bottom and corresponding openings through the sounding-board. Through these openings the knotted ends of the strings are passed, and round pins are inserted for holding the strings in the niches provided for them. There are many objections to this arrangement, among which may be mentioned the following: It is not possible to keep the pins absolutely tight, and consequently they cause a jingling sound that very much impairs the clearness of the tone. If it is attempted to force the pins in tight enough to prevent this jingling, the bridge, and even the sounding-board, is frequently split. Jingling is also caused by the contact of the loose ends of the strings with the under side of the sounding-board, and these ends, the knots tied in them, and the ends of the pins projecting into the interior of the instrument break up the sound-waves, and thereby still further impair the tone of the instrument. A break in the continuity of the sounding-board will also impair the tone, and hence it is desirable that all of these things be avoided. To avoid

them is one of the objects of my present invention, according to which the bridge is constructed of a strip of wood  $d$ , which is flat on its under side and glued to the top of the sounding-board, the latter being without perforations. In the top side of this strip, near its front edge, is a longitudinal groove, in which is secured the customary strip  $d'$ , of bone, pearl, metal, or other material, upon which the strings rest. Bored through this strip from front to rear are a number of holes  $d^2$ , (one for each of the strings of the instrument,) and at the front end of each of these holes is a counterbore  $d^3$ . To secure the strings they are passed through the holes provided for them, respectively, and knots tied in their ends to prevent their withdrawal, the purpose of the counterbores being to receive and conceal the knots. In order to avoid angles over which the strings have to be bent abruptly, the rear side or edge of the strip  $d$  is rounded off, as at  $d^4$ , so that the top of the strip and the top sides of the holes  $d^2$  are united by a curved surface. In the drawings this portion  $d^4$  is shown constructed on an arc of a circle; but it is sufficient for practical purposes if the contour be simply without sharp angles. Another objection to the use of pins for retaining the strings in place is that their heads interfere materially with the movement of the hand in fingering. This and all of the other objections above enumerated are obviated by constructing the bridge and securing the strings as above described, and shown in the drawings.

The remaining features of the invention relate to the "harp attachment," or the means for providing from one to six or more additional strings. To this end I secure to the side of the head proper A an extension A' of sufficient size to receive the number of pins F' necessary for the additional strings it is desired to provide. In the drawings I have shown four additional strings E'; but this number is purely arbitrary, and either a greater or a less number may be used without departing from the spirit of my invention. The head proper A forms the customary angle with the neck B, so that the strings E span the space between the string-rests  $d'$  and G. The string-rests G' of the extension A' is farther away from the body of the in-

strument than the rest G of the head A, and hence in order to bring all of the strings E and E' in the same plane it is necessary that the extension A' occupy a plane somewhat above the plane of the head proper A. For this reason the head and extension are united by an offset *a* of such height that the rests G and G' are in the same plane, while the head and extension are in different planes, the latter being slightly above the former. It is possible to so construct this extension that it will require no support other than what it receives through the offset *a*; but in order to prevent the possibility of the neck's being twisted by the constant strain of the strings E', I prefer to place between the extension and the body of the instrument a support II, consisting of a rod of wood suitably secured at its respective ends to said extension and body. Preferably it has an extension *h*, which is secured to the top of the sounding-board, and beneath this extension a tenon which is let into the body of the instrument in a manner similar to that in which the neck is let in, a block of wood being glued to the inside of the body for giving it the necessary strength at the point of attachment. For the sake of convenience in fingering it is desirable to have all the strings a uniform distance apart near the bridge, and hence all the holes *d*<sup>2</sup> of all the strings (both E and E') are a uniform distance apart; but at the same time it is necessary that along the neck of the instrument a sufficient space X be left between the strings E and the strings E' to permit the thumb of the left hand to move freely along the side of the finger-board without coming in contact with any of the strings. The pin F' of the last one of the strings E' is therefore set out sufficiently far to provide the necessary space. Thus the strings E and E' diverge toward the head, the support II being parallel to the strings E'.

In the drawings I have shown the head proper A and the extension thereof A' formed of separate pieces of wood secured together; but it is obvious that they may be formed in one without departing from the spirit of my invention.

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

1. A bridge for musical instruments, having a suitable string-rest on its top side, holes for the strings extending through it from the rear, and a surface without sharp angles uniting its top surface and the holes, substantially as set forth.

2. A bridge for musical instruments, having a suitable string-rest on its top side, the holes *d*<sup>2</sup>, extending through it from the rear, and the rounded rear edge *d*<sup>4</sup>, providing a curved surface uniting the top surface of the bridge with said holes, substantially as set forth.

3. In a musical instrument, the combination, with a sounding-board, of a bridge secured thereto and having holes extending through it from the rear, and a surface without sharp angles uniting said holes with the top of the bridge, and the strings E, resting upon the top of said bridge, doubled upon themselves and passed through said holes, bearing upon the aforesaid surface that unites the top of the bridge and the holes, substantially as set forth.

4. In a musical instrument, the combination, with the body and the neck joined centrally thereto, of a head having an extension at the side thereof, and strings secured to the body and to said head and extension, substantially as set forth.

5. In a musical instrument, the combination, with the body and the neck joined centrally thereto, of the head having an extension at the side thereof, the customary strings secured to the body, extending along the neck and secured to the head proper, one or more additional strings secured to the body and to the extension, and a support extending from said extension to the body, substantially as set forth.

6. In a musical instrument, the combination, with the body, the neck, and the head A, having the extension A', of the diverging strings E and E', secured to the body at uniform distances apart and to the head A and extension A', respectively, with sufficient space between the two sets to admit the operator's fingers, substantially as set forth.

7. In a musical instrument, the combination, with the body and the neck, of the inclined head A, having the extension A' and offset *a*, and the strings E and E', secured to the body of the instrument and to the head A and extension A', respectively, substantially as set forth.

8. In a musical instrument, the combination, with the body and neck, of the inclined head proper A and extension A', having string-rests G and G', respectively, located at different distances from the body of the instrument, the offset *a*, uniting said head and extension, and the strings E and E', secured to the body and to the head and extension, respectively, substantially as set forth.

9. In a musical instrument, the combination, with the body and the neck, of the head A, united to the neck at an angle, the extension A', united to head A by an offset *a*, said head and extension occupying different planes, the string-rests G and G', secured to the parts A and A', respectively, and the keys for the attachment of the strings, substantially as set forth.

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