

(No Model.)

C. S. WEBER.
STRINGING PIANOS.

No. 416,201.

Patented Dec. 3, 1889.

Fig. 1.

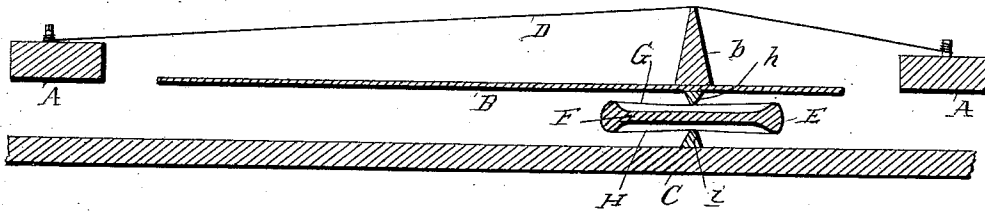


Fig. 2.

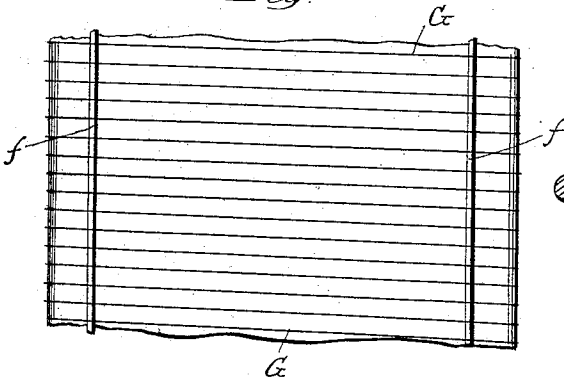


Fig. 3.

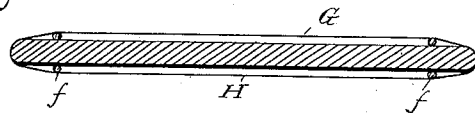


Fig. 4.

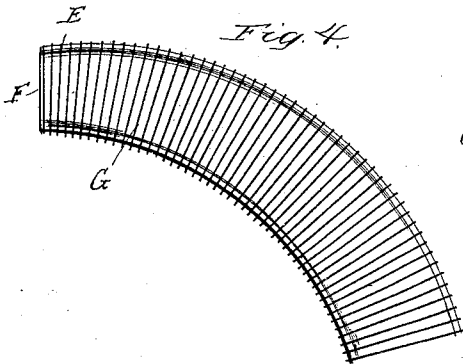
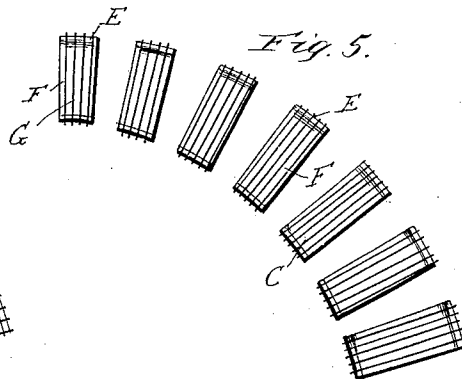


Fig. 5.



Witnesses
C. S. Weber
Van Buren Hillyard.

Inventor
Charles S. Weber.

By his Attorneys

R. S. & A. Lacey

UNITED STATES PATENT OFFICE.

CHARLES S. WEBER, OF SAN JOSÉ, CALIFORNIA.

STRINGING PIANOS.

SPECIFICATION forming part of Letters Patent No. 416,201, dated December 3, 1889.

Application filed April 8, 1889. Serial No. 306,366. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. WEBER, a citizen of the United States, residing at San José, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Stringing Pianos; and I do 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 the letters of reference marked thereon, which form a part of this specification.

This invention relates to the method of stringing pianos, and most especially to the means or tensional cushion for supporting the sound-board against the pressure of the strings when the latter are caused to bear upon the sound-board at right angles to the plane thereof.

This invention, while especially designed for pianos, is equally suitable for all kinds of stringed instruments, such changes being made as are rendered necessary to adapt it to the instrument required.

The improvement consists of a tensional cushion, which is composed of a central core and tensionals upon both faces of the core, a space of proper length and height being left between the opposing faces or sides of the said core and the tensionals, whereby the latter can vibrate in unison with the sound-board and not detract from its vibratory qualities. The tensionals are supported on ridges near each edge of the core and may be separate pieces—one for each side of the core—or may be a single piece encircling the core, the latter being the preferable construction, as it equalizes the strain and compression on the said core, so that it will not be liable to warp.

The improvement further consists of the novel features and peculiar construction and combination of the parts, which will be hereinafter more fully described and claimed.

In the drawings, Figure 1 is a sectional view, parts being broken away, of the string-frame, case, and sound-board of a piano, showing the application of my invention; Fig. 2, a top plan view of a modified form of tensional cushion; Fig. 3, a cross-section of the cushion

shown in Fig. 2; Fig. 4, a top plan view of a tensional cushion made to conform to the outline of a bridge of an ordinary piano, and tapering in width from end to end proportionate to the diminution of the length of the piano-strings, whereby the supporting capabilities of the tensionals will be inversely as the ratio of the tension on the musical strings; and Fig. 5, a top plan view of a tensional cushion composed of a plurality of sections graduated to correspond with the varying tension of the musical strings.

The string-frame A, sound-board B, and casing C are of usual and well-known construction, and are shown to illustrate the principle and application of my invention. The musical strings D are deflected from the sound-board by the bridge *b* and press against the sound-board at right angles to the plane thereof. The tensional cushion E is arranged between the sound-board and the case C or other rigid part of the frame of the case, and is composed of the core F and the upper and the lower tensionals G and H, respectively. These tensionals G and H are supported or press on ridges near each edge of the core, by which that portion between said ridges is held a proper distance from the core. These ridges may be integral with the core, and are formed by thickening the core at or near its edges, as shown most clearly in Fig. 1; or they may be separate bars *f* placed on the core, as shown in Figs. 2 and 3. The upper tensional G may be separate from the lower tensional, as will be readily understood; but the best results are obtained and the cushion rendered more economical of construction and durable by having the said tensionals formed of a single piece which encircles the core. The tensionals are composed of any suitable material, and may be in the shape of a diaphragm, or composed of a series of strands, the latter being preferable, in that each element of the tensional can be strained to its maximum limit, thereby producing a cushion that will not give to any appreciable extent after a reasonable length of time. The material best adapted for the tensional is fine steel wire, which is wound around the core and spaced at proper intervals, being tightened by suitable means.

In Figs. 2 and 3 is shown a construction

by which the tensionals can be tightened by driving the cross-bars *f* nearer the edges of the core.

The sound-board is provided on its nether or reverse side with a ridge or supplemental bridge *h*, which is directly opposite and follows the course of the bridge *b*. The tensional cushion is placed between the supplemental bridge *b* and a corresponding ridge *i* on the case, and conforms in outline to the contour of the said ridges *h* and *i*, so that the latter may bear on the tensionals of the cushion on a line midway between the edges of the said cushion, which line represents the maximum elasticity of the tensionals, as will be readily comprehended.

It is well known that the tension on the treble strings is higher than on the bass strings, and that the tension on the strings is graduated between the extreme treble and bass strings; hence, to compensate for the variable tension it has been found expedient to gradually reduce the width of tensional cushion, as shown in Fig. 4, or to provide a series of cushions of graduated sizes, as shown in Fig. 5, proportionate to the strain to be supported thereby.

Any well-known means that will admit of the free vibration of the sound-board can be provided to prevent the displacement of the tensional cushion during transportation of the instrument, or to fix its position relative to the sound-board and case.

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

1. The combination, with the sound-board, the musical strings exerting a pressure on the sound-board at right angles to the plane thereof, and the case or frame, of the tensional cushion for sustaining the sound-board, placed or suspended between two ridge-like projections, one on the sound-board, the other on the case or frame, substantially as set forth.

2. In a stringed instrument, the combination, with the sound-board and the musical strings exerting a pressure on the sound-board at right angles to the plane thereof, of the tensional cushion for sustaining the sound-board against the pressure of the musical strings, the tensionals of said cushion being graduated, substantially as and for the purpose described.

3. The combination, with the sound-board, the musical strings exerting a pressure against the sound-board, the frame or case, and two ridge-like projections, one on the sound-board and the other on the case or frame in the same plane with the line of pressure of said musical strings on the sound-board, of the tensional cushion supported midway of its edges between the said ridge-like projections, substantially as and for the purpose specified.

4. The herein-described tensional cushion for the purpose described, composed of a core and an upper and lower tensional supported on ridges at or near the edges of the said core, substantially as described.

5. The herein-described tensional cushion, composed of a core and an upper and a lower tensional formed of a single piece, which encircles the said core, substantially as described.

6. A tensional cushion for the purpose described, composed of a core having ridges at each edge and having a strand wound around the core to form upper and lower tensionals, substantially as and for the purpose described.

7. The combination, with the core and the bars *f* at each edge, of the strand wound around the core, substantially as and for the purpose described.

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

CHARLES S. WEBER.

Witnesses:

S. A. TERRY,

VAN BUREN HILLYARD.