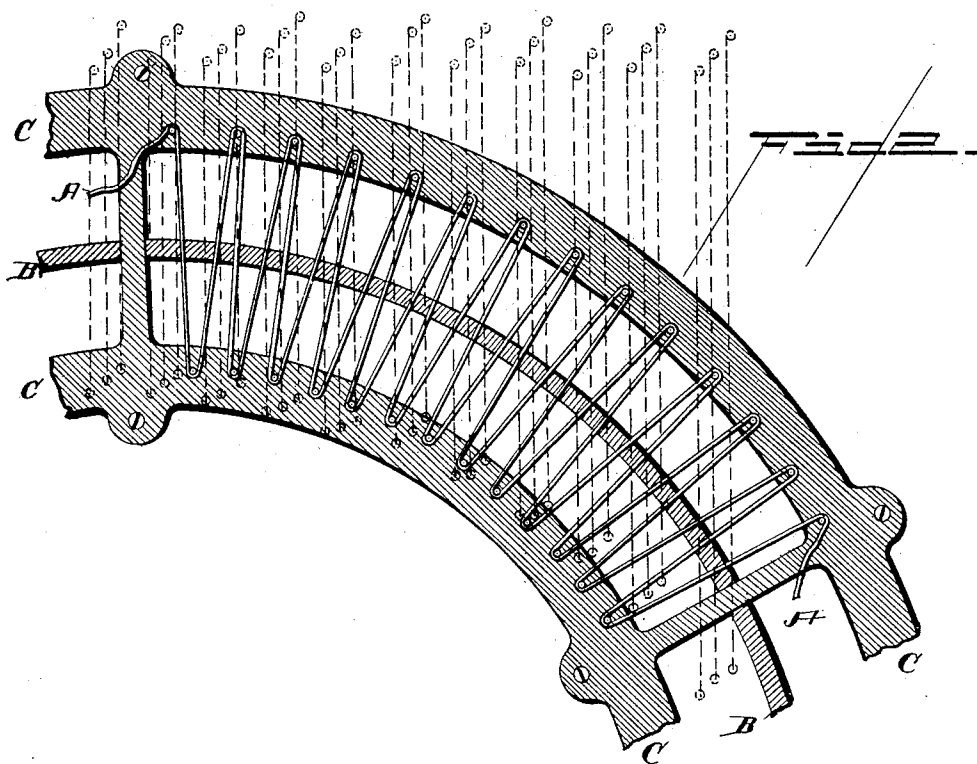
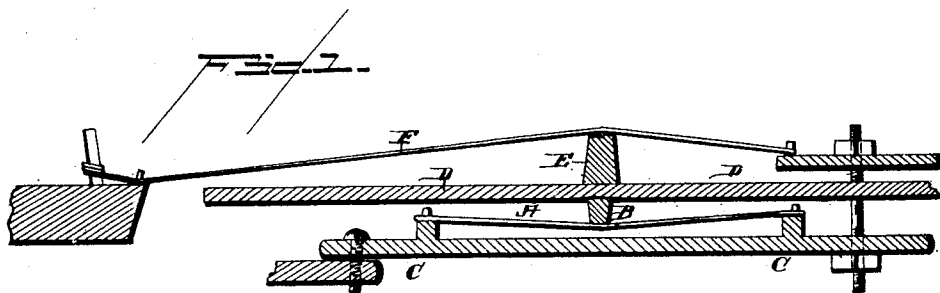


(No Model.)

C. S. WEBER.
STRINGED INSTRUMENT.

No. 462,645.

Patented Nov. 3, 1891.



WITNESSES

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UNITED STATES PATENT OFFICE.

CHARLES S. WEBER, OF SAN JOSÉ, CALIFORNIA.

STRINGED INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 462,645, dated November 3, 1891.

Application filed August 20, 1888. Serial No. 283,262. (No model.)

To all whom it may concern:

Be it known that I, CHARLES S. WEBER, a naturalized citizen of the United States, residing at San José, county of Santa Clara, State of California, have invented a new and useful Improvement in Stringed Instruments; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to certain improvements which are intended more particularly for piano-fortes, but are also applicable to other stringed instruments. These improvements consist in a set of strings, called here "tensionals," stretched tightly on a strong frame, which in turn is fastened to the framework of the instrument and so placed that these tensionals should press against the sound-board on the side opposite to where the musical strings are placed, care being taken that the centers of these tensional strings should always follow the course of the bridge on the sound-board, as shown in the accompanying drawings.

Figure 1 shows the musical string F, pressing, by means of the bridge E, against the sound-board D, while the tensional A, by means of the bridge-like projection B, (which may be called "mock bridge,") is pressing against the opposite side of the sound-board. Fig. 2 shows the tensionals on that part of a piano-forte where the greatest bend occurs in the bridge. This latter always follows the same course as the mock bridge, which is shown at B in Fig. 2. These auxiliary strings so placed enable us to hold the sound-board in position without perceptibly diminishing its vibratory power, while we are enabled to give the musical strings in a piano-forte the same position as is found on the violin and at the same time entirely to dispense with the use of the numerous pins bored into the bridge, thereby doing away with one of the main defects that cause piano-fortes to deteriorate in time. Neither the length nor the thickness and not even the number of these tensional strings has any definite relation to the thickness, length, and number of the musical strings. They may be all of the same length,

as shown in Fig. 2, or they may be somewhat longer in those places of the bridge where the greatest vibratory power is required; and as for their number we may augment this indefinitely, only it is evident that by a greater number of tensional strings thinner grades will suffice to balance the pressure of the musical strings. Moreover, we may change the material composing the tensional strings without perceptibly altering the tone of the instrument. Thus we may replace steel by catgut or silk strings, or even by a membrane whose almost endless filaments will act as a set of very fine tensional strings, here described.

The accompanying drawings show no provision for tightening the tensionals, these having been fully stretched at the time of putting them up; but it is evident that in a more expensive construction provision might be made for tightening them at any time. They are also shown as equidistant; but as the number of musical strings brought to bear on equal lengths of the bridge varies we must also vary the distance from one tensional to the other by putting them closer together where the pressure of a greater number of musical strings is to be supported. The tensionals being all about the same length and of the same tension, if allowed to be excited by sympathy, would produce a sound which would be generally disturbing in the progress of harmony. To prevent this a strip of cloth woven in between these strings will suffice.

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

1. In a stringed musical instrument, the combination, with the sound-board and the musical strings exerting a pressure on the said sound-board at right angles to the plane thereof, of a vibratory non-musical tensional exerting a pressure against the opposite side of the sound-board proportionate to the pressure of the musical strings, the pressure of the musical strings and the non-musical tensional being applied to the sound-board in the same straight line and at right angles to the plane of the said sound-board, substantially as described.

2. In a stringed musical instrument, the combination, with the sound-board having a

bridge projecting from each side at diametrically-opposite points and the musical strings deflected from the sound-board by and touching the bridge on one side of the sound-board
5 at one point, of the vibratory non-musical tensional exerting a pressure on the bridge on the opposite side of the said sound-board proportionate to the pressure of the musical strings to retain the sound-board in a normal
10 position, substantially as set forth.

3. In a stringed musical instrument, the combination, with the sound-board having a curved bridge projected from one side and the musical strings touching the bridge at one
15 point and deflected from the sound-board thereby, of a vibratory non-musical tensional parallel with and conforming to the curva-

ture of the said bridge and supporting the sound-board against the pressure of the musical strings, substantially as described. 20

4. In a stringed musical instrument, the combination, with the sound-board and the musical strings exerting a pressure thereon, of a tensional to support the sound-board against the pressure of the musical strings, 25 comprising a string which is carried back and forth between suitable supports in a zigzag direction, substantially as described.

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

CHARLES S. WEBER.

Witnesses:

JACOB DURELL,
WM. BUNCH.