

T. KATER.
Piano Sounding-Boards.

No. 135,126.

Patented Jan. 21, 1873.

Fig. 1.

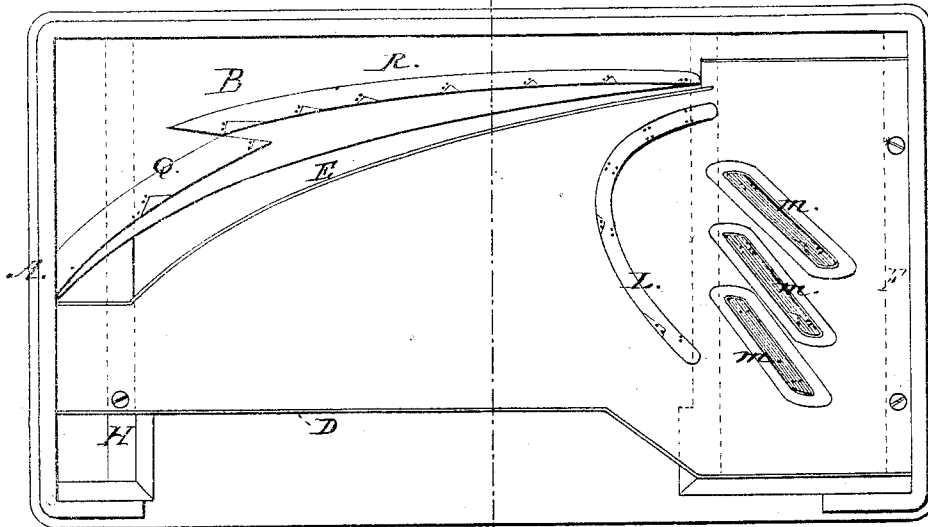


Fig. 2.

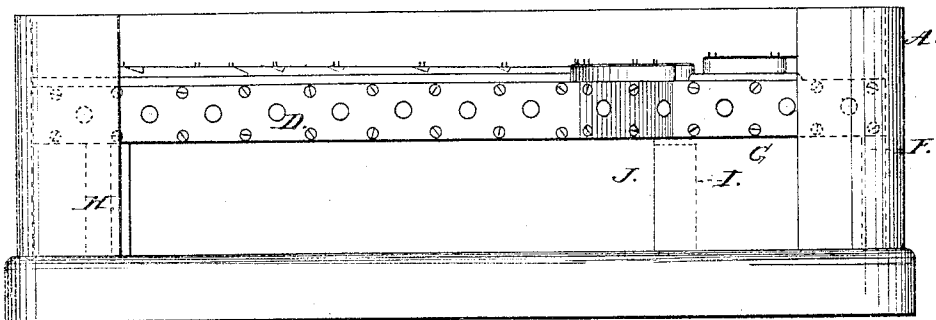
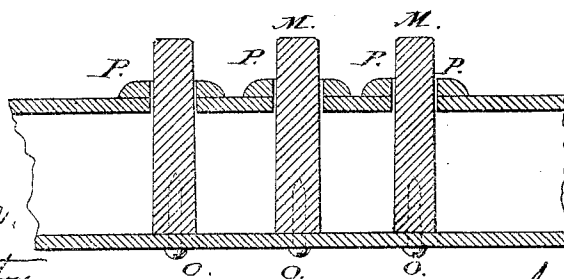


Fig. 3.



Witnesses:

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Inventor:

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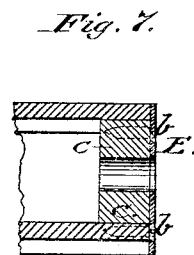
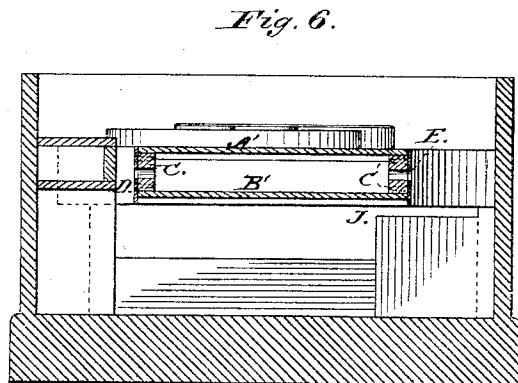
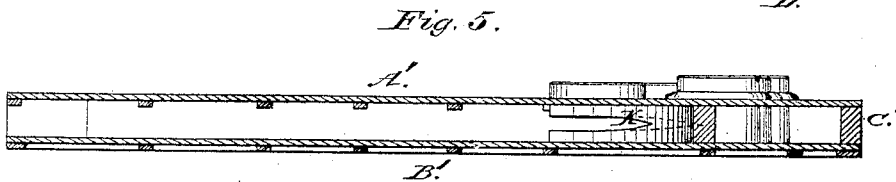
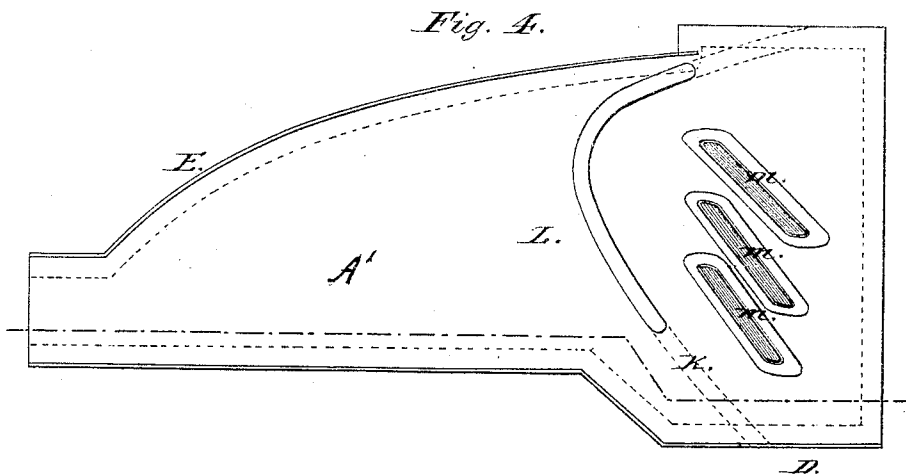
By

James L. Norris,
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UNITED STATES PATENT OFFICE.

THOMAS KATER, OF HAMILTON, CANADA.

IMPROVEMENT IN PIANO SOUNDING-BOARDS.

Specification forming part of Letters Patent No. 135,126, dated January 21, 1873.

To all whom it may concern:

Be it known that I, THOMAS KATER, of Hamilton, in the county of Wentworth, Province of Ontario and Dominion of Canada, have invented certain new and useful Improvements in Sounding-Boards for Piano-Fortes, of which the following is a specification:

This invention has for its object to produce a double sounding-board for pianos which shall possess greater resounding or vibrating powers than others heretofore constructed, due provision being also made for preventing expansion and contraction by changes of temperature. The principal feature of my invention consists in constructing the sounding-boards of two superposed boards corresponding in size and shape to each other, and connected together at their edges by means of longitudinal bars or strips, to which are attached metallic plates or bands, which, while always maintaining the boards in their proper relative positions to each other, shall serve to prevent their expansion and contraction from the effects of the temperature or other causes. The invention further consists in the provision of a sympathetic spring-bridge arranged between the sounding-boards to which they are secured, corresponding in position and curve with the outside curved bridge, for strengthening and causing the boards to act in sympathetic unison and harmony, and thus insure a perfect tone. The invention also consists in combining, with a sounding-board possessing the characteristics above stated, a series of bridges attached to the lower sounding-board and protruding through openings in the upper board, as hereinafter specified. The invention further consists in supporting the sounding-board within the piano-case upon blocking in such a manner that the entire front edge of the sounding-board shall be out of contact with and disconnected from the front bar and the cheek-piece, whereby a perfect vibration of the boards is secured and the volume of the sound augmented.

In the drawing like letters of reference indicate corresponding parts.

Figure 1 is a plan or top view of a piano-case with the sounding-board and its series of bridges, the dotted lines showing the sounding-board supporting-blocks. Fig. 2 is a front elevation of the same, showing the metallic

plates or bands secured upon the sounding-board. Fig. 3 is a detached enlarged sectional view of the series of bridges and the double sounding-board. Fig. 4 is a top view of the sounding-board removed from the case, the dotted lines showing the form of the sympathetic spring-bridge. Fig. 5 is a longitudinal section of the double sounding-board, showing the arrangement of and opening in the sympathetic spring-bridge. Fig. 6 is a transverse section of the piano-case with the double sounding-board in position, and showing the mode of attaching the metallic plates or bands.

The piano-case A and the stationary tuning-block bridges are constructed in any preferred manner common to piano-fortes. The sounding-board is composed of two separate or distinct boards, A' B', each of corresponding contour and size, arranged one above the other, and both rigidly connected together their entire length by the edge-strips C C', so as to form a sound chest or chamber between them. Said strips C C' serve to support and retain the two sounding-boards at the proper distance apart; at the same time, for preventing any undue contraction or expansion due to atmospheric changes, I attach upon the outside of the side strips connecting the boards metallic plates or bands D E, which are suitably perforated, together with the connecting strips, for permitting the egress of sound from the space produced between the sounding-boards. The metallic plates or bands extend the entire length of the front and rear edges of the sounding-boards, and thus impart solidity and strength to the whole device, but at the same time permitting of a free vibration. By employing the metallic plate or band upon the rear edge of the sounding-board all brackets for connecting the sounding-board with the tuning-block are dispensed with, and the edge of the board, being thus disconnected, secures a perfect vibration throughout its entire surface, and hence a perfect freedom and volume of sound. The metallic plate or band D, above referred to, extends the entire length of the front edge of the sounding-board, and acts upon the same in the manner similar to the one above set forth, and each acts as an auxiliary to the other in imparting strength and rigidity to the boards. In order

to obtain a greater resonance or volume of sound, and secure the best effects of the sounding-boards, the same is suspended within the piano-case upon the blocking F G H in such a manner that it shall be out of contact with or isolated from the treble cheek-piece I and the front bar of the usual iron frame. By such suspension the space J is left between the bottom of the sounding-board, and all bolt and other rigid connection between the sounding-board, the front bar, and the iron frame avoided; the omission of which connections admits of and secures a perfect and uniform vibration of the sounding-board, and relieves the latter of strain when the piano is tuned. For causing the two sounding-boards to act in sympathetic unison or harmony with each other there is arranged between the same a sympathetic spring-bridge, K, which corresponds in position and curve with the curved bridge L arranged upon the outside of the upper board, and immediately below which this spring-bridge is secured. The rear ends of the sympathetic spring-bridge approximate each other, and may have interposed between them suitable bearing or fulcrum-blocks, while those portions of the spring which extend from the fulcrum-points are glued or otherwise secured between the sound-boards beneath the curved bridge L. The series of bridges M is secured to the lower sound-board by means of screws O, and extend vertically up through openings P formed in the upper board, and a suitable distance above the same, for receiving the entire series of strings, extending from the bridges Q R on the tuning-block or main bridge B.

The object of employing and securing a series of bridges, M M, to the lower sounding-board, and passing the same through the upper board so as not to come in contact with the same, is for equalizing the strain of the strings and to afford a greater vibrating surface, at the same time securing for each board an equal tension or proportion of strings, whereby an equal vibration is effected and the sound or tone rendered harmonious and uniform.

In some instances I intend to employ the metallic plates or bands D E in connection with a sounding-board composed of a single board, since by their presence I am enabled to impart to the said board much solidity and resistance, and hence protect such single board against strain and secure a perfect vibration and harmony of sound. In such sounding-

boards the edges will be built up by fastening thereon a strip of wood and connecting therewith the metallic plate by fasteningscrews and cement.

A sound-board constructed as above described will be conducive of augmenting the volume of sound and of improving the tone of the same, and will also combine durability and cheapness with the power of resistance to hygrometrical or atmospheric changes. The latter result is obtained by the metallic plates or bands attached in any preferred manner to the sounding-boards, but preferably by screws and cement. The upper and lower sounding-boards are glued to the edges of the side strips and secured in place by means of fasteningscrews b entering the side strips.

I claim as my invention—

1. The sounding-boards A' B', each of a corresponding shape and size, connected together at their edges by the strip C C' and either or both of the metallic plates D E, as herein set forth.
2. In a double sounding-board for pianos, the sympathetic spring-bridge, K, as and for the purpose set forth.
3. The sympathetic spring-bridge K, corresponding in form with the curved bridge L and secured immediately below the same to the sounding-boards, as shown and described.
4. The sounding-boards A' B', connected by metallic plates D E and combined with the series of bridges M M attached to the lower board and extending through the upper board, and arranged with respect to the curved bridge L and the strings, as shown and described.
5. A sounding-board for pianos, consisting of the boards A' B', metallic plates D E, and connecting-strips C C', in combination with the series of bridges M, curved bridge L, and sympathetic spring-bridge, substantially as described.

6. The sound-boards supported within the case, as described, and removed from contact with the treble cheek-piece, the iron bar, and iron frame, as and for the purpose set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 14th day of January, 1873.

THOMAS KATER.

Witnesses:

JAMES L. NORRIS,
ALBERT H. NORRIS.