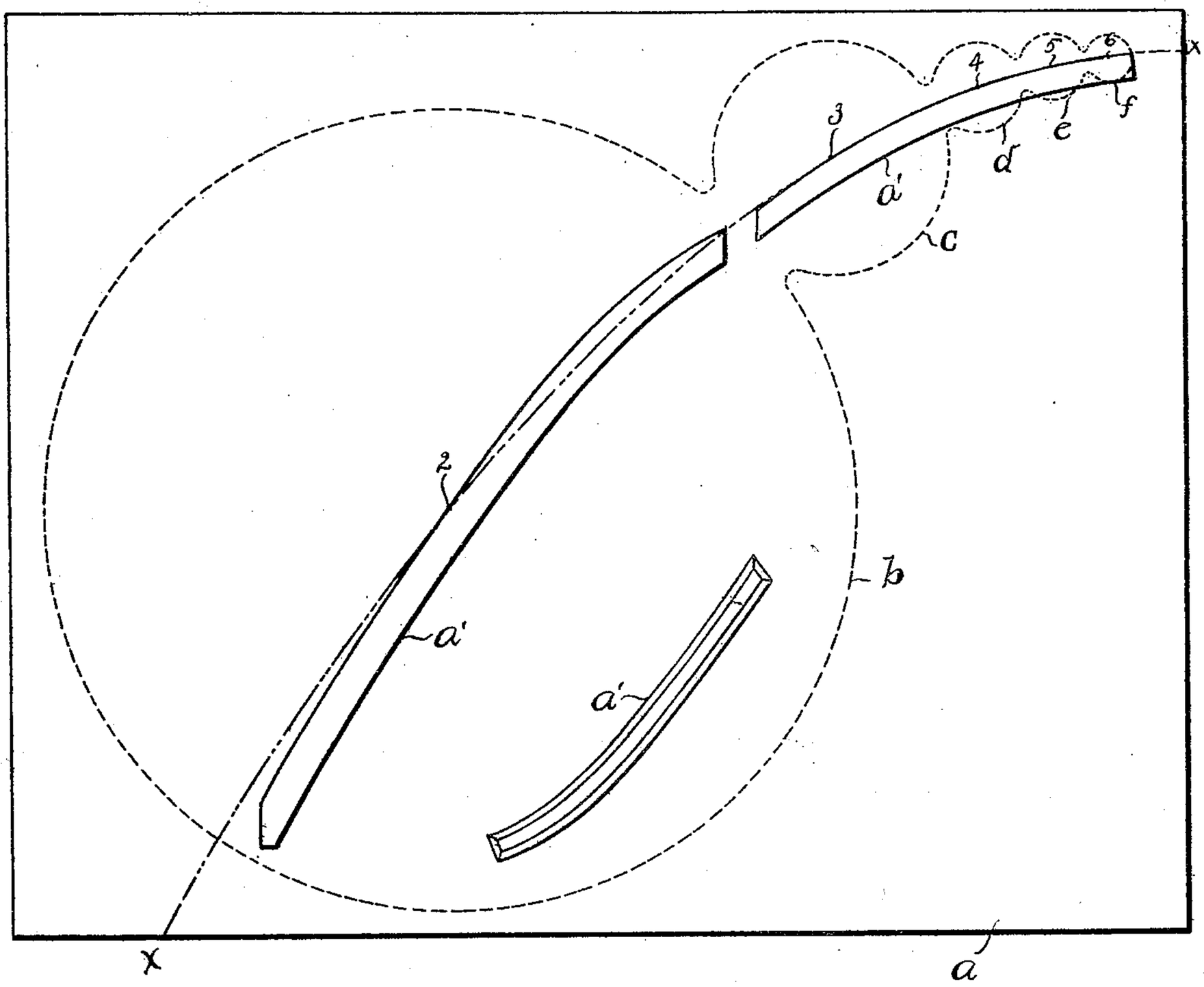
(No Model.) 2 Sheets—Sheet 1.

W. H. HOWE.

SOUNDING BOARD FOR PIANOS.

No. 572,897. Patented Dec. 8, 1896.

FIG. 1.



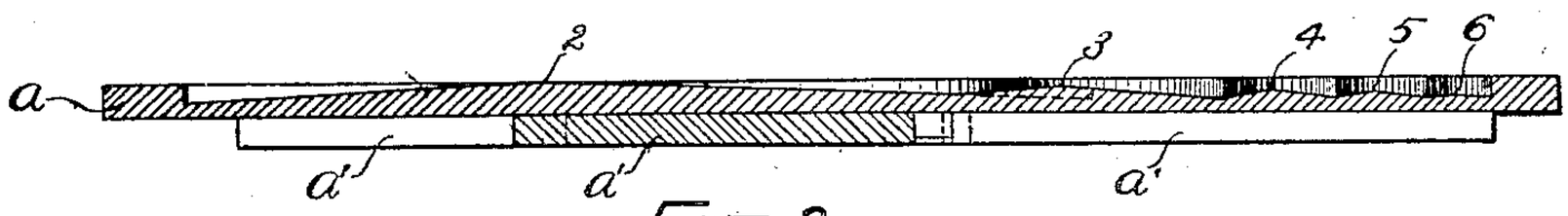


FIG. 2.

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(No Model.) 2 Sheets—Sheet 2.

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FIG. 3.

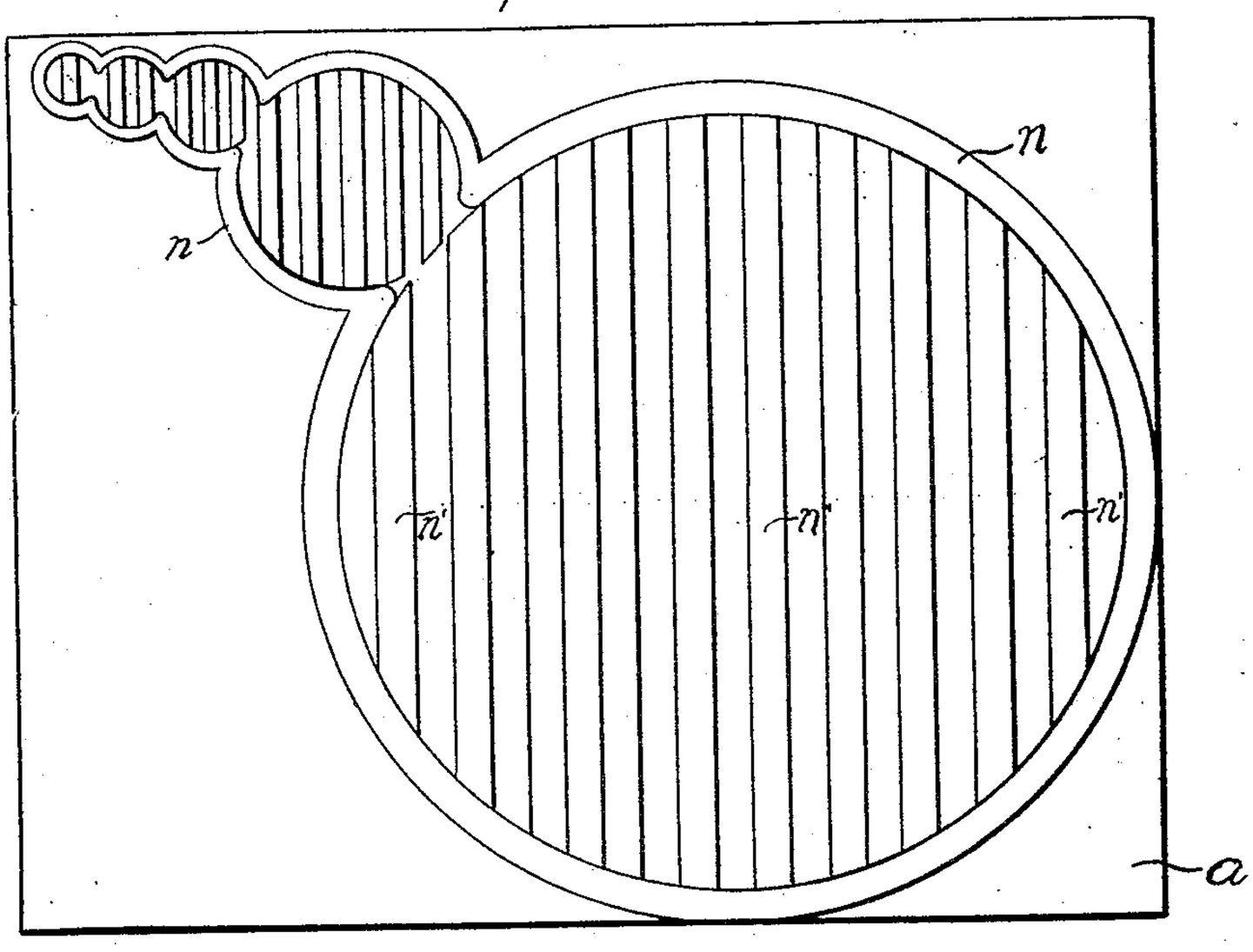
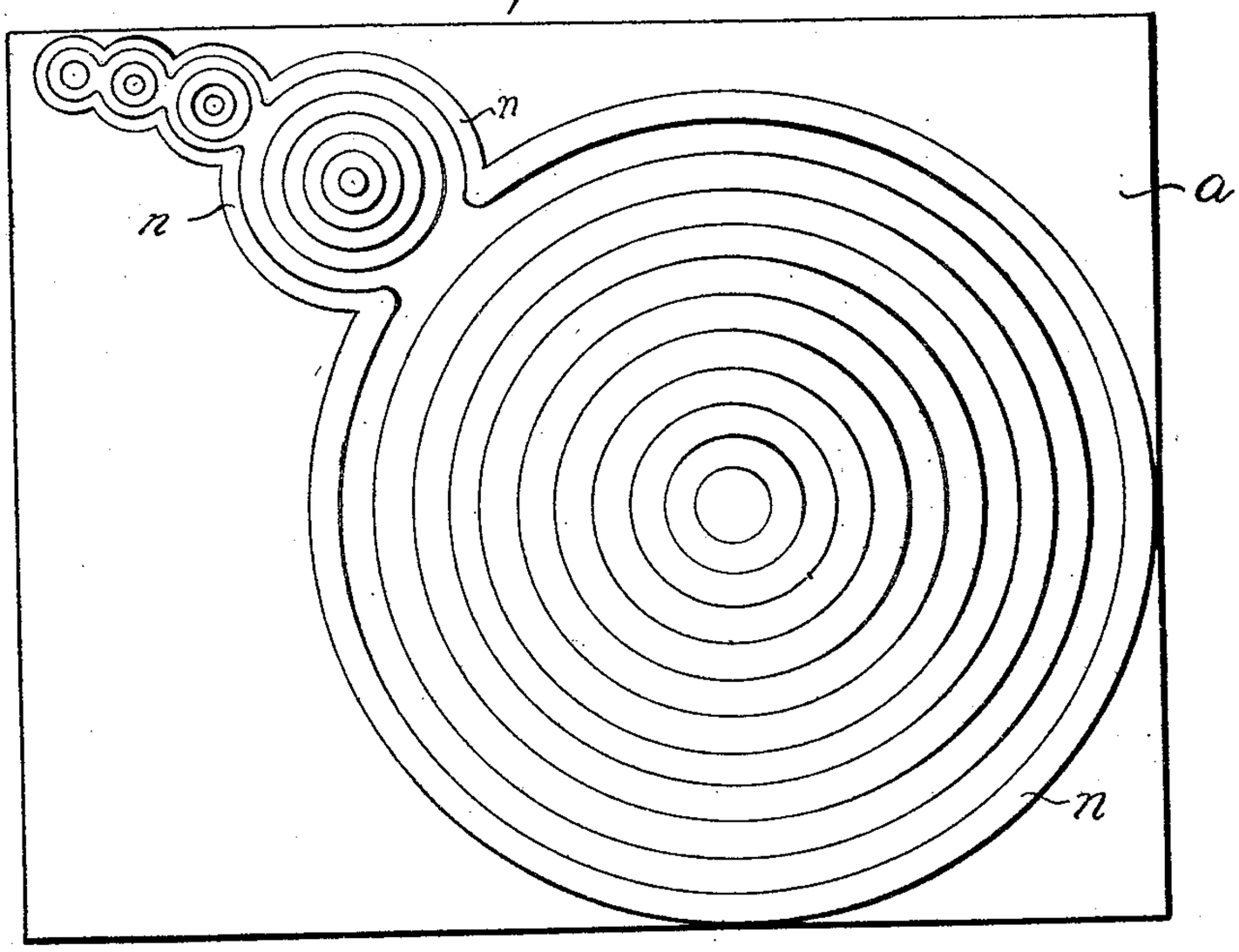


FIG. 4.



WITNESSES.
Harry A. Robinson.
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INVENTOR.
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UNITED STATES PATENT OFFICE.

WILLIAM H. HOWE, OF WATERTOWN, MASSACHUSETTS.

SOUNDING-BOARD FOR PIANOS.

SPECIFICATION forming part of Letters Patent No. 572,897, dated December 8, 1896.

Application filed April 9, 1896. Serial No. 586,770. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. HOWE, of Watertown, county of Middlesex, State of Massachusetts, have invented an Improvement in Sounding-Boards for Pianos, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

Sounding-boards for pianos have been made of many different shapes and sizes, but so far as I am aware they have been made of a gradually-increasing thickness from one end of the board to the other.

Sounding-boards so made of a gradually-increasing thickness from end to end do not respond with equality over all to the vibrations of the strings, some parts of the board vibrating more than other parts, and in fact it appears that some parts of the board more or less remote from the bridge or bridges over which the strings pass vibrate but little, if at all. As a consequence the resonance of the different tones varies, that is to say, the different tones do not possess equal carrying or singing quality, as, for instance, in ordinary pianos the diminution of resonance of the higher tones is usually very marked.

This invention has for its object to construct a sounding-board for pianos and the like which will vibrate with equality or with substantial equality over all, that is to say, from end to end of the "scale," resulting in the production of more resonant tones, which by their augmented carrying or singing quality are more pleasing to the ear, and what is, perhaps, more important resulting in equalizing the resonance or carrying or singing quality of the tones of the scale from end to end.

In some pianos the lower part is too heavy or strong as compared with the upper part, and in other instances the upper part is too sharp and shrill, its tones lacking resonance, and my present invention is intended to remedy these difficulties. These results I have obtained by "graduating" the sounding-board, *i. e.*, varying its strength or resistance at different parts, which may be done in a number of different ways, as, for instance, by varying the thickness.

Sounding-boards of ordinary upright pianos are substantially rectangular in form, the strings crossing and recrossing it diagonally, and hence the "scale," as it is called, runs diagonally or nearly so across the sounding-board, and I preferably employ several graduations, or graduated portions, and arrange them diagonally across the sounding-board in such a manner as to accord with the diagonal arrangement of the strings and thereby correspond to or accord with the scale.

Figure 1 shows in front view a sounding-board "graduated" in a manner to embody the broad features of this invention; Fig. 2, a cross-section of the same, taken on the curved dotted line *x x*, looking downward; Fig. 3, a rear side view of a sounding-board graduated differently, yet designed to accomplish the same result; and Fig. 4, a rear side view of a sounding-board graduated in still another way.

The sounding-board *a* is or may be of any usual shape and size, and it may have upon it any usual or suitable bridges *a'*, over which the strings pass.

In graduating the sounding-board, as represented in Figs. 1 and 2, I establish a series of points at suitable distances apart, as at 2, 3, 4, 5, and 6, said established points beginning near the lower or base end of the board and gradually coming nearer together as they approach the upper or treble end, and then I gradually reduce or diminish the thickness of the board radially from these established points, said radial graduations from each point covering an area which may be described by a circle which may be clearly defined in the board, if desired, and herein represented in Fig. 1 by dotted lines *b*, *c*, *d*, *e*, and *f*. As the established points are located nearer together as they approach the treble end of the scale, the circles will of course become smaller in diameter. At the established points the board may and preferably will be made of less thickness for each point as they approach the upper or treble end. Herein five established points are represented, although I do not limit my invention to any particular number, nor do I desire to limit my invention to having the radial graduations confined to covering a circle, as it is

obvious that they may extend to the edge of the board, if desired, or to any predetermined line.

I find that a single large graduated portion, such as *b*, will alone produce many beneficial results when arranged with the bridge or bridges over which the strings pass, extending diametrically across it, and hence, while I consider it preferable to employ a series of graduated portions, I do not desire to thus limit my invention.

Instead of graduating the board by working it out or cutting away the material I may take a thin board and build up the graduated portions.

In Fig. 3 I have represented a thin board having circular portions defined by marginal strips *n*, and across said circular portions, preferably running crosswise the grain of the wood, brace-bars *n'* are placed, which are made of varying thickness, so that when completed the central part of each circular portion is of greatest thickness, strength, stiffness, or resistance, from which part or point the strength or resistance gradually diminishes to the marginal strips. In this case it will be seen that the same results are accomplished as in Figs. 1 and 2.

In Fig. 4 a thin board is shown, having thereon marginal strips *n*, defining certain circular portions, within each of which the board is built up with a series of thin circular disks or veneers, each of less diameter than the one upon which it is placed, and each laminated portion thus formed is made of a predetermined thickness at the center, producing substantially the same results as are accomplished in the figures previously described. Therefore I desire it to be understood that wherever I refer to "graduated" portions I desire to include within the spirit and scope of this invention any form or construction of such portion or portions.

I claim—

1. A sounding-board having two or more graduated portions extending across the board to accord with the scale, one of said graduated portions being of greatest strength or resistance at the middle, and gradually diminishing toward the edge, and a bridge over which the strings pass extending across said graduated portions, substantially as described.

2. A sounding-board having several graduated portions, extending from the base toward the treble end of the board, and bridges over which the strings pass extending across said graduated portions, substantially as described.

3. A sounding-board having a graduated portion confined within a marginal strip of an established thickness, said graduated portion being made of greater strength or resistance at the middle than at the edges, substantially as described.

4. A sounding-board having a series of graduated portions, extending across the board to accord with the scale, and confined within marginal strips of an established thickness, and bridges diametrically crossing said graduated portions, substantially as described.

5. A sounding-board having a series of graduated portions, extending from the base toward the treble end of the board, each portion having an established point of a certain thickness, strength or resistance, and each portion being gradually reduced in thickness, strength or resistance, from its established point.

6. A sounding-board having a series of circular graduated portions, each portion having an established point of a certain thickness, strength or resistance, and each portion reduced in thickness, strength or resistance radially from such point.

7. A sounding-board having a series of graduated portions, extending from the base to the treble end of the board, each portion toward the treble end covering less area than the preceding portion, and each portion having an established point of a certain thickness, strength or resistance, from which point the board is diminished or reduced radially, substantially as described.

8. A sounding-board having a series of graduated portions, extending from the base to the treble end of the board, each portion toward the treble end covering less area than the preceding portion, and each portion having an established point of a certain thickness, strength or resistance, from which the board is diminished or reduced radially, the thickness, strength or resistance of the board at each established point of the series as they approach the treble end being less than the preceding one, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM H. HOWE.

Witnesses:
B. J. NOYES,
F. H. DAVIS.