

F. FRANKEL.
SOUNDING BOARD.

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1,062,275.

Patented May 20, 1913

Fig. 1.

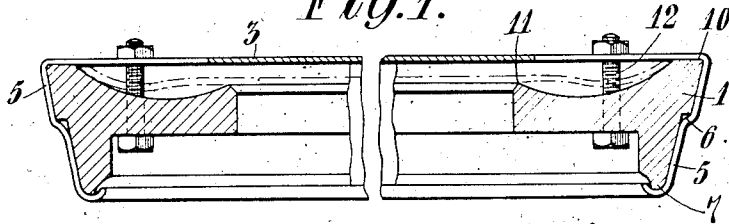


Fig. 2.

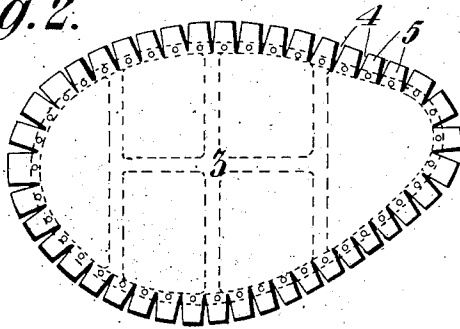


Fig. 4.

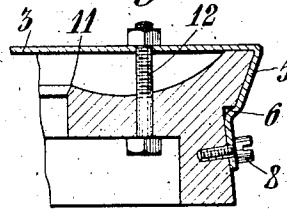


Fig. 3.

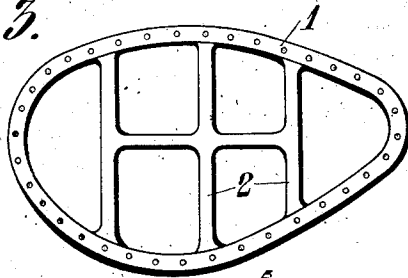


Fig. 5.

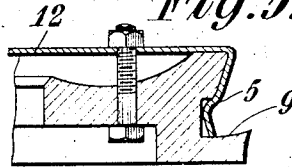


Fig. 8.

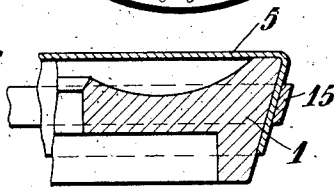


Fig. 6.

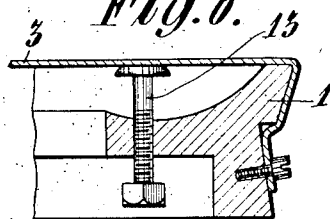


Fig. 9.

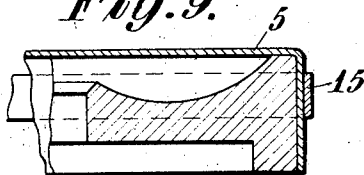
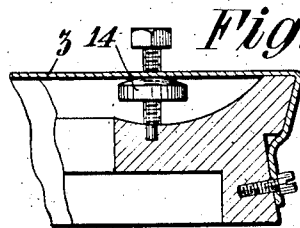


Fig. 7.



Witnesses.

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SOUNDING-BOARD.

1,062,275.

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To all whom it may concern:

Be it known that I, FRIDOLF FRANKEL, a subject of the King of Sweden, residing at Stockholm, in the Kingdom of Sweden, have
5 invented new and useful Improvements in Sounding-Boards, of which the following is a specification, reference being had to the drawing accompanying and forming a part hereof.

10 This invention relates to the manufacturing of sounding-boards for pianos and other musical instruments, such as guitars, violins and the like, or for other purposes where sounding-boards are required, such as in the
15 walls of music halls, etc.

Attempts have already been made to produce sounding-boards for pianos of metal plate (sheet-metal) but so far as I am aware it has hitherto not been possible to obtain a
20 good instrument with such a sounding-board. This seems to depend on the fact that the sounding-board has not been sufficiently well secured to the frame and suitably stretched therein. It is to be observed
25 that, in order to obtain a good resonance, it is indispensable that the sounding-board has a certain high tension.

In attaching sounding-boards to their frames several mistakes have been committed.
30 The frames were usually formed by two extended metal rings between which the sufficiently heated sheet-metal plate was placed. The plate was thereupon while hot clamped in position by screws extending
35 through holes in the rings and the plate. It has, however, been found that, when the tension is very high, the screws cannot sufficiently clamp the plate but allow it to slip. Moreover, the rings, as usually constructed,
40 were too weak to withstand the tension, and, therefore, were distorted or caused to yield.

The fastening of the plate in a heated condition, in order to obtain a sufficient tension by the contraction of the plate in cooling, is
45 connected with difficulties, for as soon as the heated plate is brought into contact with the cold metal rings, the edge of the plate is cooled and contracts. The inner part of the plate is, therefore, caused to belly and the
50 tension arising as the plate cools is not sufficient to fully stretch the plate. The tension obtained is too small and so irregularly distributed that a good resonance will not be obtained.

55 The object of the invention is to remove the said drawbacks and make it possible to

obtain perfectly good sounding-boards of sheet-metal.

One part of the invention consists in this that the plate is slitted or cut at the edge
60 so that a series of tongues are formed which are fastened to the frame suitably by being bent over the outer edge of the same and thereupon secured to the frame in any suitable way, such as by bending the tongues
65 around a downwardly projecting flange, by screws, or by a band placed while hot around the tongues at the outer side of the frame.

Another part of the invention consists in exposing the sounding-board secured to the
70 frame to normal pressure, at or near the bearing surface of the frame, so as to force the sheet metal plate out of the plane of the bearing surface. This method of stretching
75 the sounding-board may be used either in combination with the method of fastening it hereinbefore described or independently of the said method.

The invention further consists in the construction and combination of parts herein-
80 after set forth.

The new method may be carried into effect in several ways, some of which will be described with reference to the drawing.

Figure 1 is a vertical fragmentary section
85 through the end parts of a frame having a plate attached to it in the manner set forth. Fig. 2 is a plan-view, on a reduced scale from that of Fig. 1, of the splitted plate. Fig. 3
90 is a plan-view of the frame. Figs. 4 to 9 show modifications.

Referring to the drawing, the frame 1 is suitably provided with a stay or stays (Fig. 3) for strengthening it. The plate used for the sounding-board is slitted at the edge, as
95 shown at 4 (Fig. 2), so that a series of tongues 5 are formed by means of which the plate may be attached to the frame. According to Fig. 1, the tongues 5 of the plate are bent over the edge of the frame 1 and be-
100 neath a rim 6 at the outer side thereof and further about a downwardly projecting flange 7 of the frame.

In the modified form shown in Fig. 4 the
105 tongues 5, as before, are bent over the edge and catch under the rim 6 of the frame, but instead of being then bent around the lower part of the frame they are secured thereto
110 by screws 8. The modification shown in Fig. 5 differs from the former in this that the ends of the tongues 5 are jammed against an edge or flange 9. In all the

frames shown the outer edge of the frame around which the strips or tongues 5 are bent is at a higher level than the inner edge 11. The sheet-metal strips or tongues may be still further stretched by means of screws 12 against the said inner edge 11, as indicated by dashed and dotted lines in Fig. 1. Between the edges 10 and 11 is suitably a recess or depression allowing the tongues to be forced below the edge 11 by which the tension is still more increased. By tightening the screws 12, after the plate 3 has been fastened to the frame, the plate will be stretched to a certain extent before the tongues will bear on the edge 11, and when the screws are further tightened, the tongues are bent down into the recess or cavity between the edges 10 and 11 so that the sheet-metal plate is strongly stretched and the desired resonance is obtained. The desired high tension of the plate may also be obtained by otherwise causing the plate to extend over a longer way than the plane through the outer edge of the frame. This may be performed for instance by screws 13 (Fig. 6) screwed into the frame from its rear side so as to lift the plate above the level of the outer edge. To the same end a nut 14 (Fig. 7) operated by a screw may be placed between the plate and the frame. According to the embodiments of the invention shown in Figs. 8 and 9, the tongues 5 are bent around the frame, whereupon a heated metal strip 15 is placed around the tongues so as to clamp the same when it cools. The outer side of the frame may extend obliquely (Fig. 8) or at right angles to the plane of the frame.

The stretching devices hereinbefore described permit, if desired, to stretch the sounding-board harder at the parts of the same next to the treble parts of the piano, which is effected by simply tightening the screws harder at the said parts. I have found that an extremely excellent instrument is obtained, if the sounding-board is stretched harder at the treble than at the bass or the intermediate parts. If the tongues formed at the edge of the sounding-

board are sufficiently stiff, either by themselves or by suitable reinforcement, the fastening of the sounding-board may be effected by simply bending the tongues over the outer edge of the frame, without any other fastening means being employed.

I claim:

1. In musical instruments, the combination of a sounding board, a frame, a sheet-metal plate resting on and secured to the frame, and screws forcing the sheet metal plate out of the plane of the bearing surface of the frame, substantially as and for the purpose set forth.

2. In musical instruments, the combination of a sounding-board, a frame, a sheet-metal plate having a slitted edge extending beyond the outer edge of the frame and secured thereto, and screws forcing the sheet-metal plate out of the plane of said edges, substantially as and for the purpose set forth.

3. In musical instruments, the combination of a sounding-board, a frame having an outer edge and an inner edge extending at a lower level than the outer one, a sheet-metal plate having a slitted edge extending beyond the outer edge of the frame and secured thereto, and screws placed in the frame between the outer edge and the inner one and forcing the sheet-metal plate against the inner edge of the frame.

4. In musical instruments the combination of a sounding-board, a frame having an outer edge and an inner edge extending at a lower level than the outer one and separated from the latter by a recess in the frame, a sheet-metal plate having a slitted edge extending beyond the outer edge of the frame and secured thereto, and screws placed in the frame between the outer edge and the inner one and forcing the sheet-metal plate against the inner edge of the frame.

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Witnesses:

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