A. KRIEGHOFF.

PIANO SOUNDING BOARD.

APPLICATION FILED MAR. 12, 1908.

910,828. Patented Jan. 26, 1909.

Fig. 1.

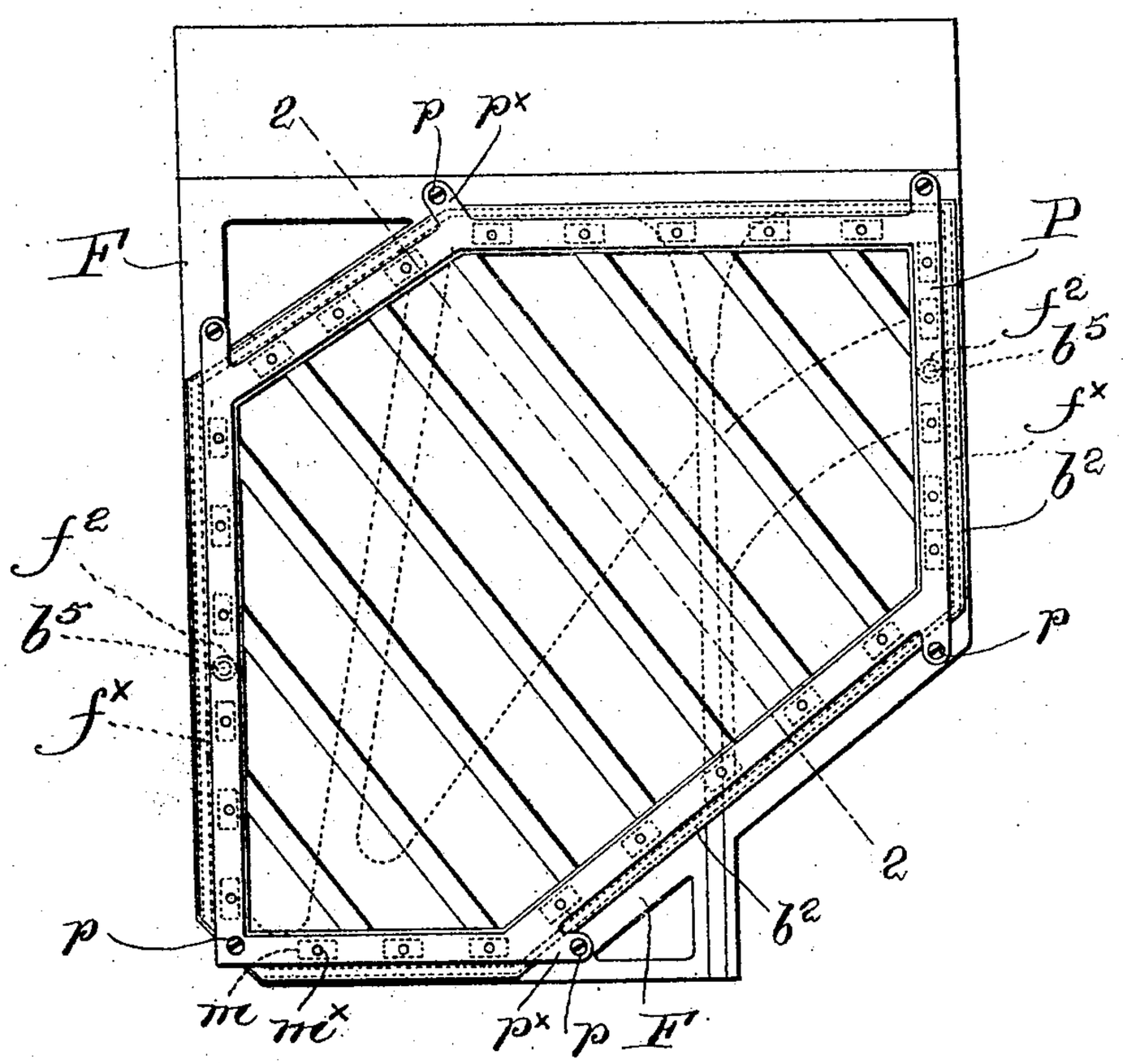


Fig. 2.

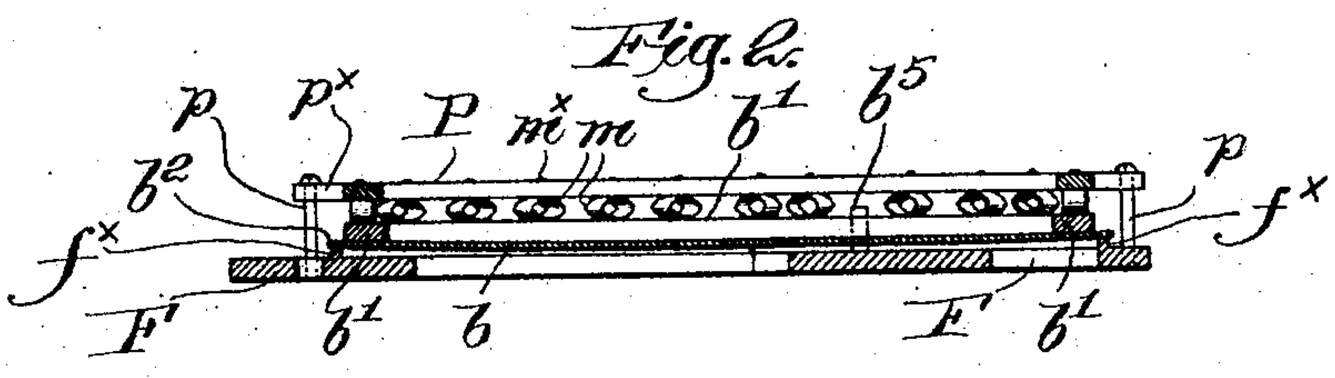


Fig. 3.

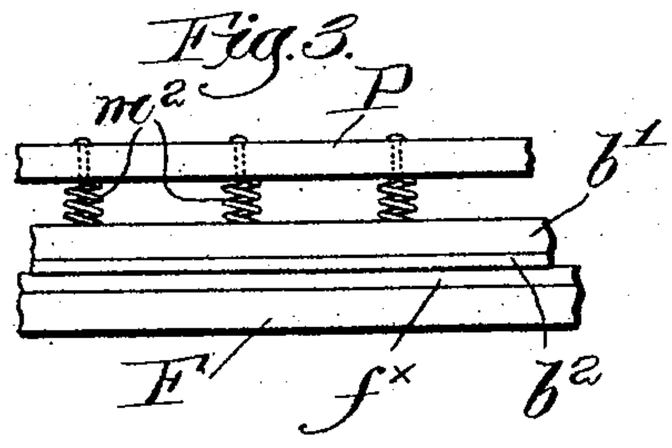
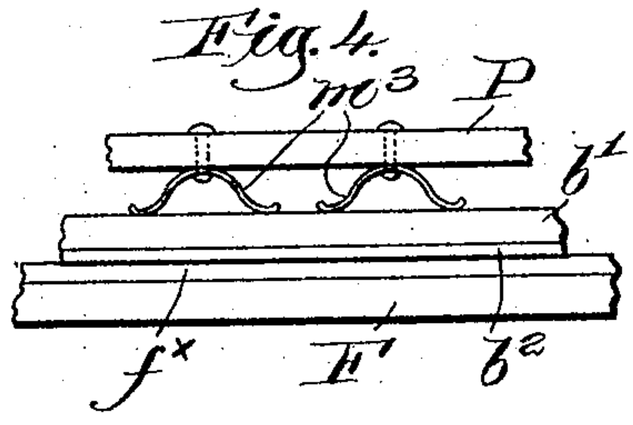


Fig. 4.



Witnesses.
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UNITED STATES PATENT OFFICE.

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PIANO SOUNDING-BOARD.

No. 910,828. Specification of Letters Patent. Patented Jan. 26, 1909.

Application filed March 12, 1908. Serial No. 420,587.

To all whom it may concern:

Be it known that I, ANTON KRIEGHOFF, a citizen of the United States, and resident of Concord, county of Merrimack, State of New Hampshire, have invented an Improvement in Piano Sounding-Boards, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention has for its object the production of novel means for supporting the sounding-board of a piano and for effecting the required convexity of the sounding-board, the construction and arrangement being such that a very rich, clear and full tone can be produced, the sounding-board being subject to adjustment at all times.

My invention is adapted for use in any kind of a piano, and especially in those pianos where, by reason of limited space the sounding-board must necessarily be of small dimensions, for by my invention I am enabled to produce with a small sounding-board a tone closely approaching in resonance, fullness and clearness the tone of a large piano, while the use of my invention will greatly improve any piano.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a back view of the metallic string-plate, sounding-board and tension-producing means embodying one form of my invention; Fig. 2 is a section on the line 2—2, Fig. 1; Fig. 3 is a detail in side elevation showing my invention with a different form of resilient members by means of which the requisite convexity of the sounding-board is effected; Fig. 4 is a similar detail illustrating yet another form of the resilient members.

Referring to the drawings, the sounding-board b of suitable shape and contour is provided at its back with a reinforce b', formed in practice by gluing to the back of the board strips of maple wood or other suitable material, adjacent its edge but set in therefrom sufficiently to leave a portion of the sounding-board slightly overhanging the reinforce as at b^2. The overhang b^2 of the sounding-board rests upon a bearing formed preferably on a metallic frame, such for instance as the string-plate F, which may be of any desired shape and structure, shown partly in dotted lines Fig. 1. The bearing is preferably made as a rib or lip $f^\times$ on the string-plate F and corresponding in contour to that of the overhang b^2, the bearing being shown in dotted lines Fig. 1 as the sounding-board is interposed in front of the plate. By this construction the only part of the sounding-board in engagement with the plate F is the overhang or extreme edge b^2, so that practically the entire sounding-board is free to vibrate under the influence of the sound waves.

The sounding-board is interposed between the metallic plate F and a pressure frame P, which is conveniently made as a casting and preferably closely conforms in shape to the sounding-board. Said frame P is secured to the plate F by suitable connections, herein shown as screws p, which have no engagement or connection with the sounding-board, as shown, the frame being herein shown in Fig. 1 as having extensions $p^\times$ at certain portions to enable the connecting members p to clear the edges of the board.

Between the frame P and the sounding-board I insert resilient means which bear against the board at its back, and within the bearing $f^\times$, as herein shown, said means being illustrated as a series of springs. In Figs. 1 and 2 they are shown as small elliptical springs m, attached to the frame P by screws, as at $m^\times$, and pressing against the back of the reinforce b'.

The required flexing and convexity of the sounding-board is effected by the action of the resilient members m pressing against the board. This may be attained by making the members m of such tension in the first instance, for a given fixed distance between the frame P and plate F when assembled, that when the frame is so positioned and held in place by the connections p the expansive tendency of the members m compressed between the sounding-board and the frame P will at once properly flex the sounding-board toward the string-plate. The flexing is more conveniently effected, however, by setting up said connections to draw the frame P and the plate F toward each other as much as may be desired, according to circumstances, so that the compressive action thereby imparted to the flexing members m will be transmitted by them to the sounding-board. However this flexing action of the flexing members is attained the sounding-board will be convexed,

as the said members act upon the board at one side of the bearing $f^{\times}$, as will be manifest, and by adjustment of the connections p the convexity may be varied as required.

It will be observed that there is no rigid connection between the sounding-board and the plate F, as the edge of the board merely rests against the bearing $f^{\times}$, and the resilient members m press against the board and act between the board and frame P. An elastic contact is thus provided for all engaged portions of the sounding-board within the overhang b^2, and the vibrations of the board thus are free to act through its entire surface up to its very edge.

The shape and general construction of the pressure frame can be varied to suit different circumstances, and the number and structure of the flexing members m can be varied as may be necessary, as long as they are so located with relation to the other parts of the structure as to impart the desired convexity to the sounding-board.

In Fig. 3 I have shown the flexing members as spiral springs m^2, bearing at their free ends upon the back of the reinforce b', and at their other ends attached to the pressure-frame P.

A bow-spring form is shown at m^3 in Fig. 4, the free ends of each bow contacting with the back of the reinforce of the sounding-board.

It will be manifest that the particular location of the connections p may be changed, and I may if desired omit the flexing members along certain portions of the sounding-board, provided the desired convexity is imparted thereto, without departing from my invention.

I make no claim herein to the bearing rib or ridge, nor to the overhang of the sounding-board to rest against such rib, as those features are included in the claims of my United States Patent No. 885261, dated April 21, 1908.

The sounding-board can be held from lateral movement relative to the plate F by means of pins f^2 on the plate entering loosely holes b^5, see dotted lines Fig. 1, in the sounding-board.

My present invention is not restricted to the precise construction and arrangement herein shown and described, as the same may be varied or modified in different details by those skilled in the art without departing from the spirit and scope of my invention as set forth in the annexed claims.

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

1. The combination, with a metallic plate and a sounding-board adjacent thereto, of a bearing rib on one to engage the other and maintain separated the plate and the edge of the sounding-board, a pressure frame connected with the plate outside of the rib and adjacent the back of the sounding-board, and resilient members interposed between the latter and the frame and acting upon the sounding-board inside the rib.

2. In piano construction, a metallic plate having a bearing rib thereon, a pressure frame, adjustable connections between it and the frame, outside of the rib, a sounding-board between the frame and plate and having its edge resting against the rib, and resilient flexing members interposed between the pressure-frame and the back of the sounding-board inside the bearing rib, to form an elastic support for the sounding-board and to impart the requisite convexity thereto.

3. In piano construction, a sounding-board, a metallic plate, a rib on one to engage the other, a series of spring members bearing against the back of the sounding-board inside the rib, and means to apply pressure simultaneously to said members and thence to the sounding-board, to flex the latter.

4. In piano construction, a sounding-board, a metallic plate, a rib on one to engage the other, a series of spring members bearing against the back of the sounding-board inside the rib, and means connected with the plate independently of the sounding-board to apply pressure thereto through the spring members, to flex the sounding-board.

5. The combination, with a string-plate, of a sounding-board adjacent thereto and sustained at its edge, and resilient means sustained independently of the sounding-board and acting upon its back inside of its sustained edge, to flex and thereby impart the requisite convexity to the sounding-board.

6. The combination, with a string-plate having a bearing thereon, of a sounding-board resting adjacent its edge against the bearing, resilient flexing members acting against the back of the sounding-board inside the bearing, and means to sustain said members independently of the sounding-board and to impart to the latter flexing pressure through the said members.

7. A sounding-board, a bearing therefor at its edge, and resilient pressure-producing means sustained independently of the sounding-board and acting at a plurality of points upon the back thereof inside its bearing, to flex and thereby impart the requisite convexity to the sounding-board.

8. The combination, with a string-plate having a bearing thereon, of a sounding-board resting adjacent its edge against the bearing, spring flexing members acting upon the back of the sounding-board inside of its bearing, a pressure frame to which said members are attached, and adjustable connections between said frame and the string-plate separate from the sounding-board, tightening of

said connections increasing the pressure imparted to the sounding-board by the said flexing members.

9. The combination, with a metallic plate and a sounding-board adjacent thereto, means to separate the plate and the edge of the sounding-board, a pressure frame connected with the plate and adjacent the back of the sounding-board, and resilient flexing members interposed between the latter and the frame and acting upon the sounding-board at one side of the separating means.

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

ANTON KRIEGHOFF.

Witnesses:

CHAS. G. REMICK,

AMOS J. PEASLEE.