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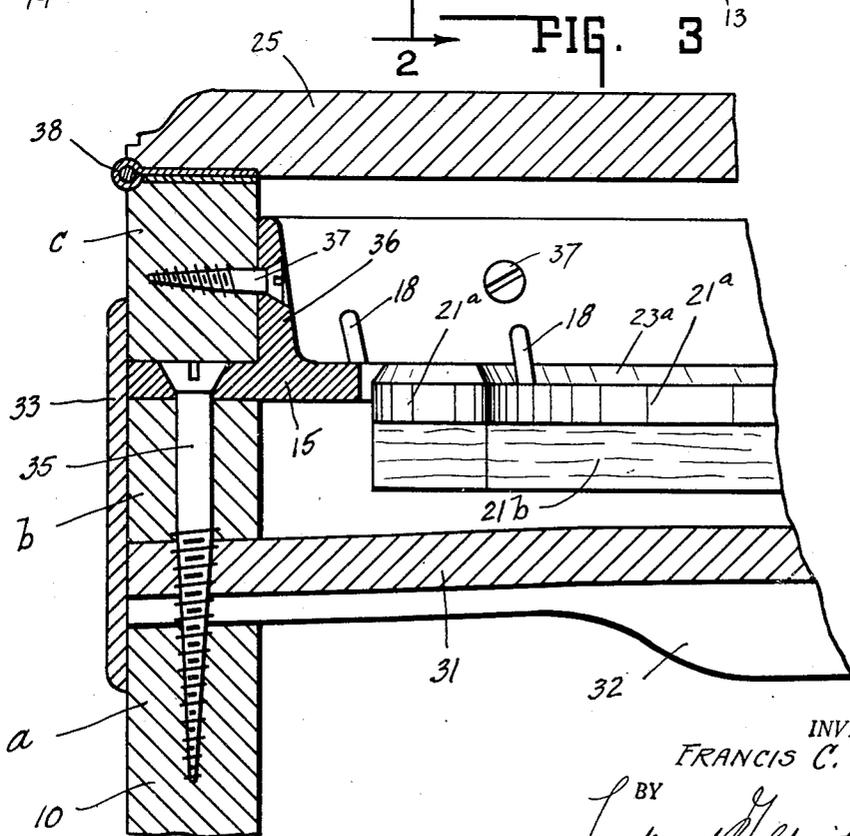
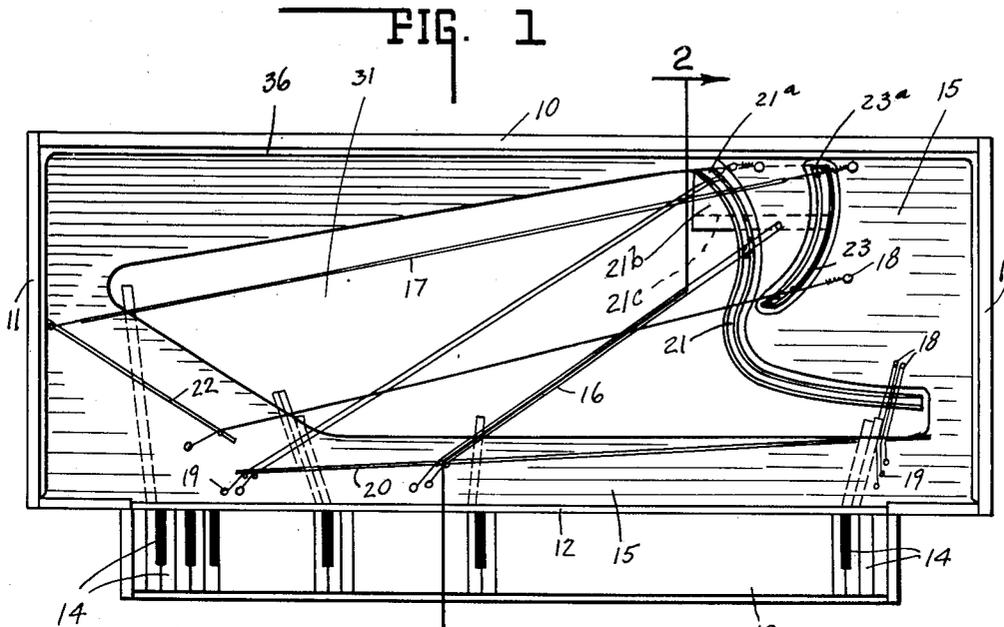
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2,486,337

PIANO CONSTRUCTION

Filed Oct. 27, 1945

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

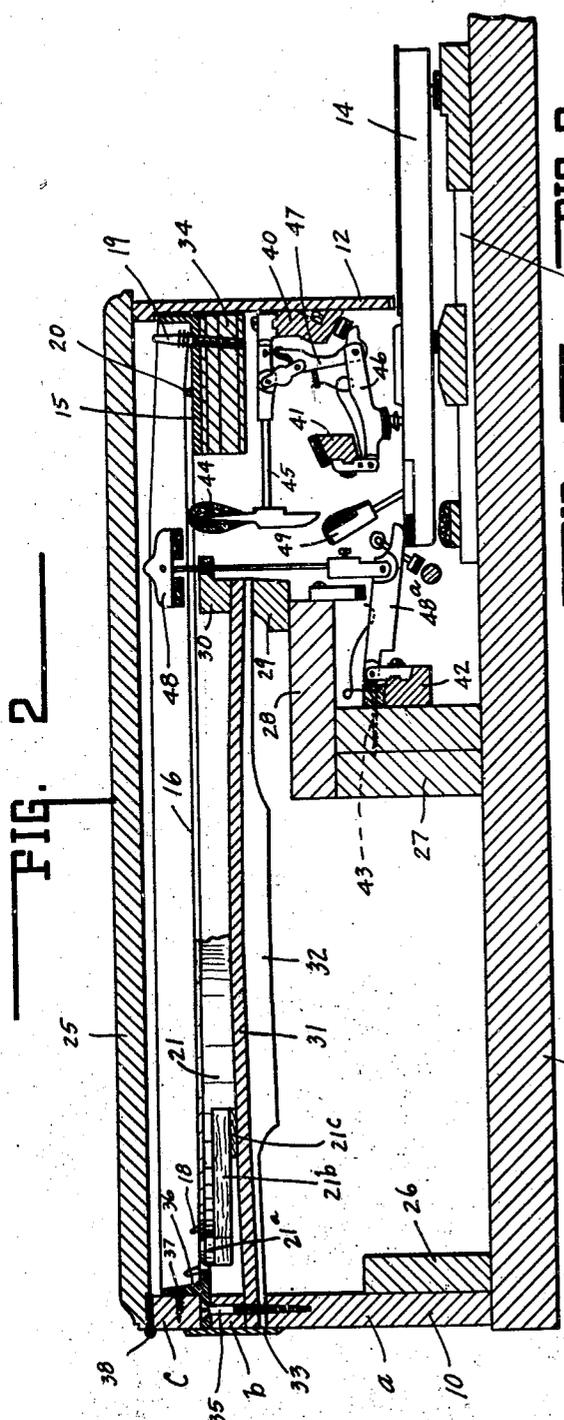


FIG. 2

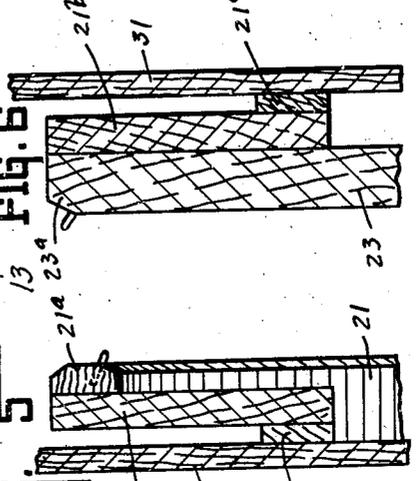


FIG. 5

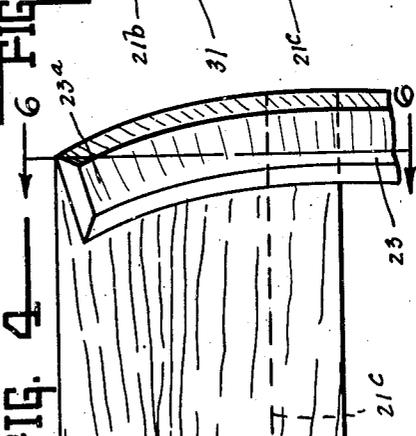


FIG. 6

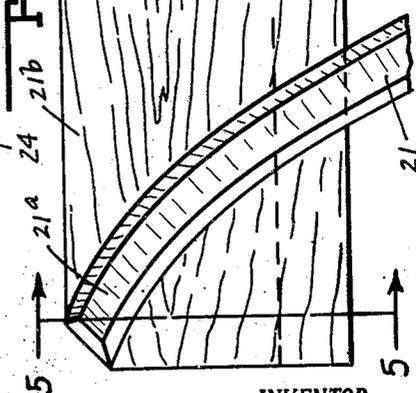


FIG. 4

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PIANO CONSTRUCTION

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8 Claims. (Cl. 84—184)

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This invention relates to a piano construction, particularly of a square piano type and in respect to the construction and mounting of the sounding board, and the arrangement of the bridges on the sounding board with respect to the piano case and action.

In the square type of piano, as well as grand pianos, it is desirable that the overall size of the case be of minimum dimensions with the maximum number of notes or keys, and at the same time provide a firmly supported sounding board and string plate of maximum area. Thus, one feature of this invention is directed to the anchorage of the sounding board wherein it extends through and is firmly anchored to the back and sides of the piano case, as well as being firmly supported and anchored along the front thereof. This permits of a maximum free area, permitting vibration of the sounding board within a piano case of minimum overall dimensions.

A further, and important feature of the invention lies in the location and arrangement of the bridges carried by the sounding board, and their location relative to the action units and keyboard. By means of the arrangement herein provided, the bass and treble bridges are both located adjacent each other at one end of the sounding board, thereby exposing a maximum area thereof for vibration, and also permitting the tuning pins to be conveniently located near the front of the piano case. Thus, the strings may be arranged to be hitched at one end toward the rear of the case with the tuning pins made accessible along the front thereof.

The arrangement of the bridges further contemplates locating the tip of the treble bridge at one end near the front of the case, to curve rearwardly, terminating in an overhanging portion at the rear. The bass bridge lies back of the treble bridge, extending from approximately the treble middle section of the sounding board to curve rearwardly, terminating with an overhanging portion at the back of the case. Both overhanging portions are supported by a spaced platform to provide a firm support therefor.

A further feature of the invention lies in the forward support of the sounding board extending along and adjacent the action, whereby it is firmly braced by an overhanging supporting

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block extending over the lower portion of the action, such as to permit of maximum vibrating area.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

Fig. 1 is a plan view of a piano case showing a square type piano illustrating the string plate arrangement and bridge arrangement.

Fig. 2 is a vertical section through the bed of the piano case taken substantially on the line 2—2 of Fig. 1.

Fig. 3 is an enlarge sectional view through the rear wall of the case showing the sounding board and string plate mounting thereon.

Fig. 4 is a plan view showing a section of the bridge supporting platform.

Fig. 5 is a section taken on the line 5—5 of Fig. 4.

Fig. 6 is a section taken on the line 6—6 of Fig. 4.

In the drawings there is shown a piano case having a back wall 10 and end or side walls 11, front panel 12, key board 13 and keys 14. Supported within the case, as hereinafter described, there is a string plate 15 carrying a series of treble strings 16 and bass strings 17. Said strings are anchored at their rear ends to the hitch pins 18 located generally adjacent the end wall 11, and to the tuning pins 19 located generally adjacent the key board. The treble strings 16 and the bass strings 17 span the space between the tensioning or bearing bar 20 and bridge 21, and the bearing bar 22 and bridge 23, respectively.

The piano case includes the key bed 24 and top lid 25, the back and end or side walls being mounted on the bed and reinforced at the lower portion by the reinforcing strip 26. Also supported upon the bed 24 substantially midway between the front and the back of the piano and extending throughout its length there is provided a supporting beam 27 carrying a forwardly extending and overhanging block 28. Supported by said block along its forward edge there is provided a forward support for the sounding board 31 comprising the lining strip 29. Above the sounding board there is provided a damper rail 30 providing a guide for string dampers.

The sounding board 31 carrying a downwardly

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extending reinforcing rib 32 is rigidly supported along its forward edge upon the lining strip 29. The opposed rear edge portion of the sounding board extends through the back wall of the piano case to be firmly anchored therein. This mounting of the sounding board and the arrangement of the bridges 21 and 23 allow a maximum effective area of vibration. The side edge portions of the board may also be similarly supported and anchored along the end or side walls of the casing. For this purpose the back, and, if desirable, the end or side walls of the case are divided into three sections, the lower section indicated at *a*, the intermediate section indicated at *b* and the upper section indicated at *c*. Those three sections are bridged by a molding or decorative strip 33.

The forward edge of the string plate 15 is carried on the pin block 34 supported at opposite ends on the bed 24. The rear or side and end edges of the string plate 15 extend through the piano case walls 10 between the sections *b*, *c*. The string plate, intermediate section *b*, sounding board and lower supporting section *a* of the walls of the piano case are interlocked and held together by the screws 35. The upper section *c* of the piano case walls is secured to an upwardly extending flange 36 formed on and extending about the periphery of the string plate, said section *c* being secured thereto by the screws 37. The piano case lid 25 may be hingedly supported upon the section *a* of the rear piano case wall by the hinges 38.

The treble tensioning or bearing bar 20 for the treble strings is provided on the string plate to extend substantially parallel and along the front of the piano case, whereas the bass bearing bar 22 on the string plate extends at an angle leading from the front of the piano case rearwardly to the left-hand end thereof. Both bridges 21 and 23 are mounted on and secured to the sounding board 31 at the right-hand end thereof. The treble bridge 21 is substantially S-curved from its "tip" and starting at approximately the front right-hand corner, and curving toward the back of the case. The bass bridge is formed arcuate shape, curving from approximately the middle portion of the treble bridge and sounding board toward the back of the case. The back end of both the treble and bass bridges are formed with an overhanging portion 21*a* and 23*a* overhanging the supported edge portion of the sounding board support substantially inwardly of its supported rear edge. The bridges are undercut at their back ends, and are joined for reinforcement and joint support by the spaced platform 21*b* which extends between and supports said ends of the bridges. The platform is mounted on the sounding board 31 by spacing strip 21*c*. By providing a spaced platform support, indicated at 21*b*, for the treble and bass bridges, their overhang is firmly supported away from the fixed edge of the sounding board for better sound contact therewith.

The piano action is mounted in the space forward of the sounding board 31 and beam 27. For mounting the action there is provided the action rails 40, 41 and 42, the rails 40 and 41 being supported in the usual manner upon the key board 13, while the rail 42 is secured to the beam 27 by the screw 43. Pivotaly supported upon the rail 40 there is the usual hammer 44 positioned to strike one of the notes 16, said hammer being carried by the hammer lever 45. Pivotaly mounted upon the rail 41, there is a wippen 46

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operably connected with the hammer lever by a flexible jack or fly 47, said wippen being in a position to be actuated by the key 14 or an extension thereof. A damper 48 is carried on the damper rod pivotaly supported upon, for actuation by, the damper lever 48*a*. Said damper lever is pivotaly supported upon the action rail 42 to be actuated by the key 14 or extension thereof. Said key or extension also carries a back check 49.

From the above described structure it will be observed that the sounding board, as well as the string plate, is supported by and within the piano case to present a maximum effective area of vibration permitted by the overall size of the piano case. Furthermore, the sounding board is firmly anchored about its rear and side or end walls. But of great importance in the structure above described is the fact that the other or front edge portion of the sounding board is firmly and rigidly supported by the piano structure, namely the beam 27, block 28 and rails 29, 30. This arrangement is such as to give full tone vibration qualities to the sounding board, while permitting the piano case to be of smaller dimensions than has heretofore been possible with such tone qualities. The effective area of the string plate and the arrangement of the treble and bass strings thereon and the arrangement of their bridges similarly affords tone qualities in a piano of smaller dimensions comparative to the tone qualities of a larger piano.

The invention claimed is:

1. In a horizontal piano structure having a piano case of the square type with back and side walls, a front panel, a key bed supporting said walls and panel, and a piano action supported within said case adjacent said front panel, the combination therewith of a string plate extending over said action from adjacent said front panel to said walls, a sounding board supported at its back and ends by said back and side walls, an overhanging cross support for the front thereof carried by said key bed, and treble and bass bridges secured at one end only to said sounding board to permit free vibration of said board throughout the central and far end thereof.

2. In a horizontal piano structure having a piano case of the square type with back and side walls, a front panel, a key bed supporting said walls and panel, and a piano action supported within said case adjacent said front panel, the combination therewith of a cross support on said key bed extending parallel to and in spaced relation to said front panel having an overhanging portion projecting towards said panel and action, and a sounding board supported along its forward edge by the overhanging portion of said cross support and having its rear edge extending through and supported by said back wall.

3. In a horizontal piano structure having a case of the square type with back and side walls, a front panel, a key bed supporting said walls and panel, and a piano action supported within said case adjacent said front panel, the combination therewith of a cross support on said key bed having a forwardly extending overhanging portion above the rear portion of said action, a string plate extending over said action and cross support with the rear edge thereof extending through and embraced by the back wall, and a sounding board supported below said string plate by the overhanging portion of said cross support at its forward edge and having its rear edge extending

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through and embraced by the back wall of the piano case.

4. In a horizontal piano case of the square type adapted to support and embrace a piano action within the front portion thereof, a sounding board 5 mounted within said case, said case including a key bed and side and back walls supported thereon, the back wall of said case having a lower section and an upper section, and means for securing the said sections together with the back edge 10 of the sounding board extending therebetween and supported upon the lower section.

5. A horizontal piano case of the square type adapted to support and embrace a piano action 15 within the front portion thereof, a string plate and sounding board, said case including a key bed, side and back walls supported on said key bed, said back wall having a lower section, an intermediate section and an upper section, the back edge of said sounding board extending between the lower and intermediate sections, and 20 the back edge of the string plate extending between the intermediate and upper sections, means for securing the back edge of said string plate and sounding board to said lower and intermedi- 25 ate sections, and means for securing said string plate to said upper section.

6. In a horizontal piano structure having a piano case of the square type and a piano action supported within said case adjacent the front 30 thereof, the combination therewith of a string plate extending over said action, a sounding board supported within said case below said string plate, and treble and bass bridges secured at one end only to said sounding board to permit free vibra- 35 tion of said board throughout its central and far end.

7. In a horizontal piano structure having a piano case of the square type with back and side walls and a piano action supported within said 40 case adjacent the front portion thereof, the combination therewith of a cross support having an

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overhanging portion extending forwardly above a portion of said action, a sounding board supported along its front edge at the forward edge of the overhanging portion of said support and at its rear edge by said back wall, a treble bridge of substantially S-shaped curvature mounted on said sounding board adjacent one end thereof and curving from its forward edge toward its back, and a bass bridge mounted on said sounding board between said treble bridge and the adjacent end of said board, said bass bridge curving toward the back of the piano case from approximately the central portion of the treble bridge.

8. In a horizontal piano structure having a piano case of the square type and a piano action supported within said case adjacent the front thereof, the combination therewith of a string plate, extending over said action, a sounding board supported within said case below said string plate, and treble and bass bridges secured to said sounding board at one end thereof to permit free vibration of said board throughout its central and far end, each of said bridges having their ends adjacent the back of the case formed to overhang said sounding board and supported thereon by a broadened base mounted on and secured thereto.

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