(Model.)

J. R. PERRY.

PIANO.

No. 292,580. Patented Jan. 29, 1884.

Fig. 1.

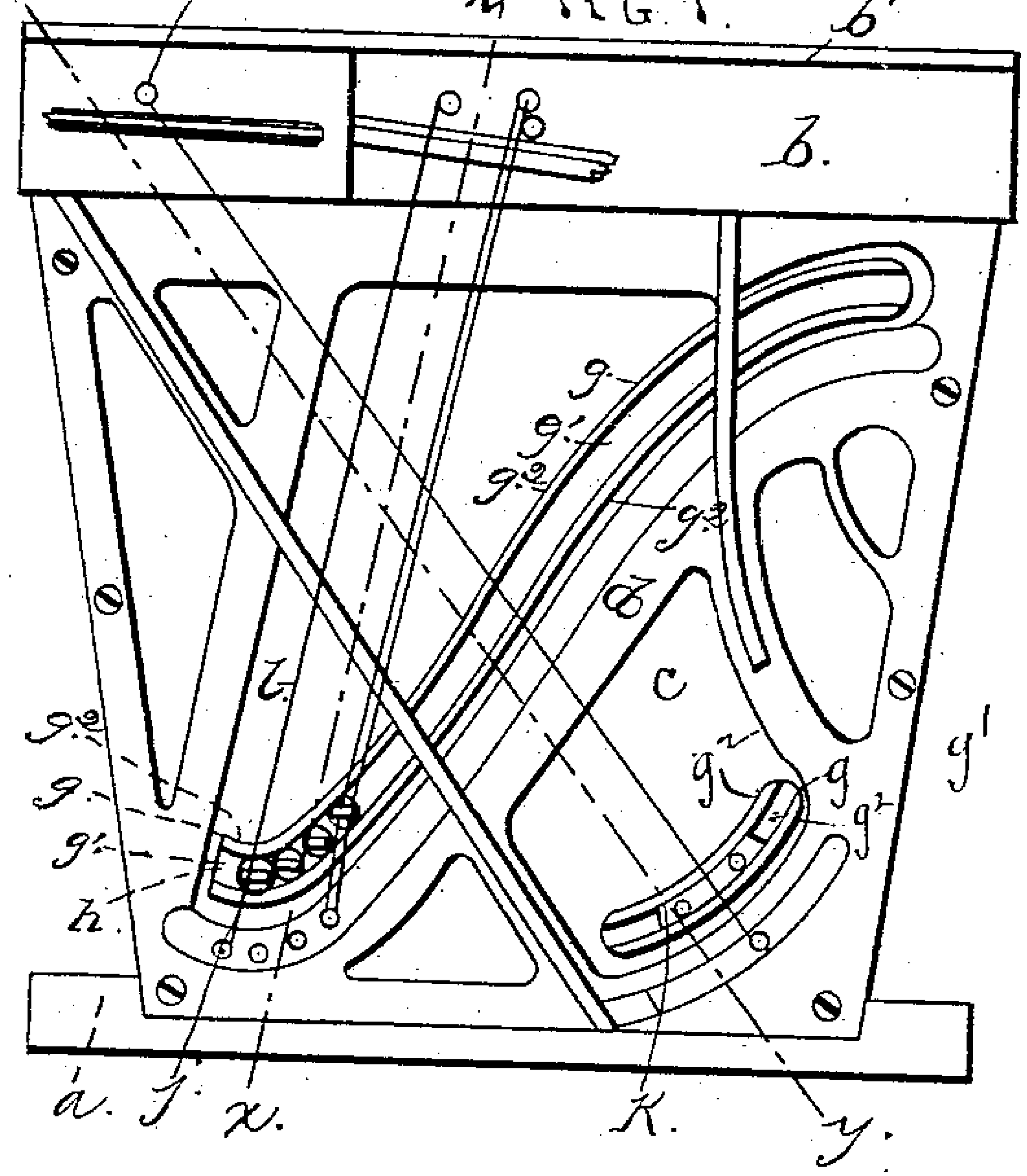


Fig. 2

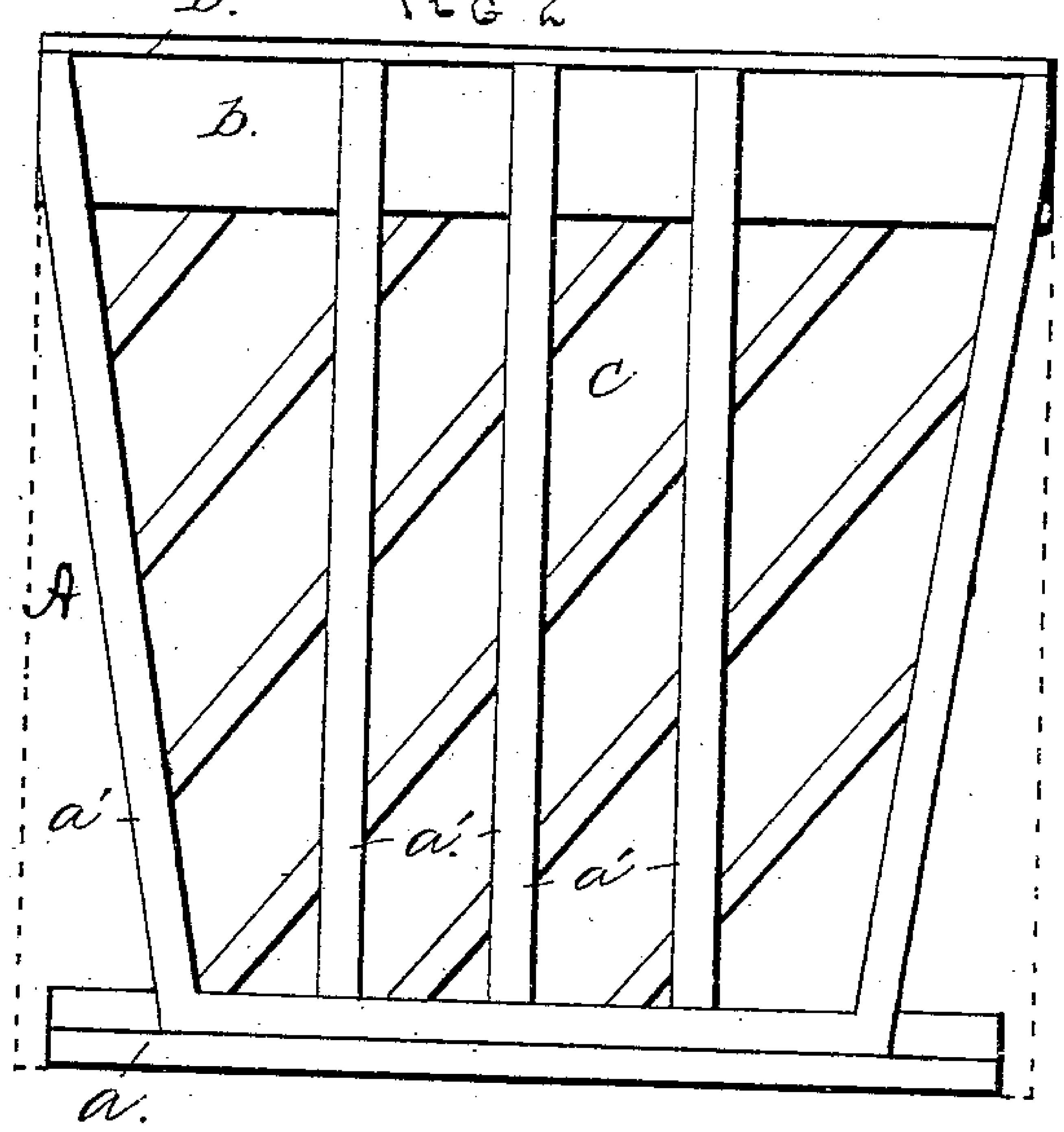


Fig. 3.

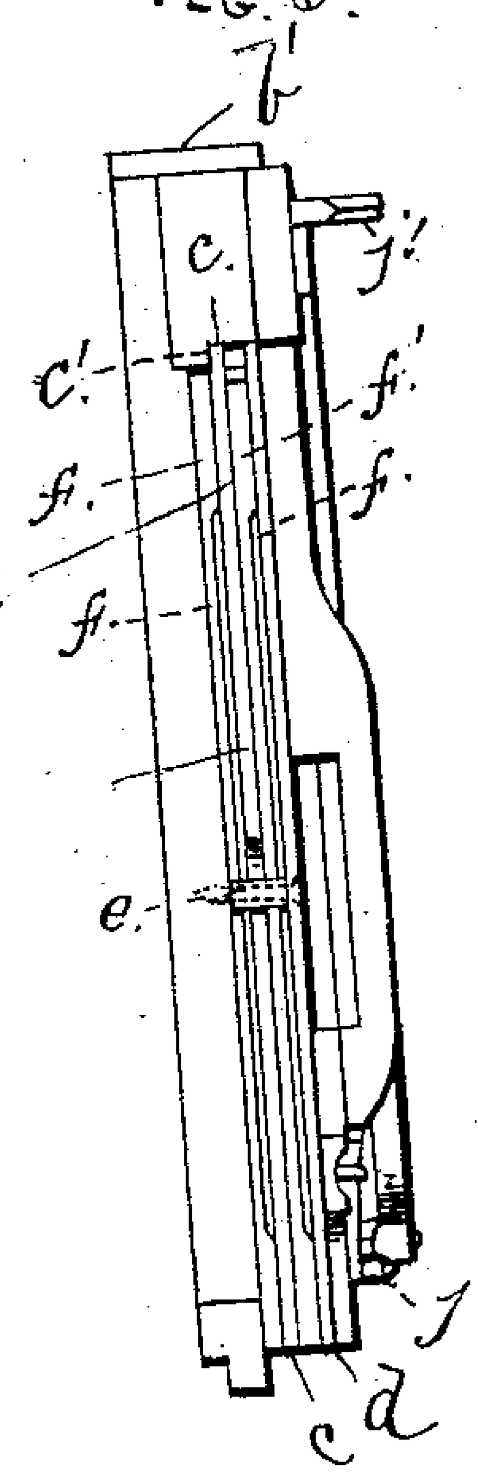


Fig. 4

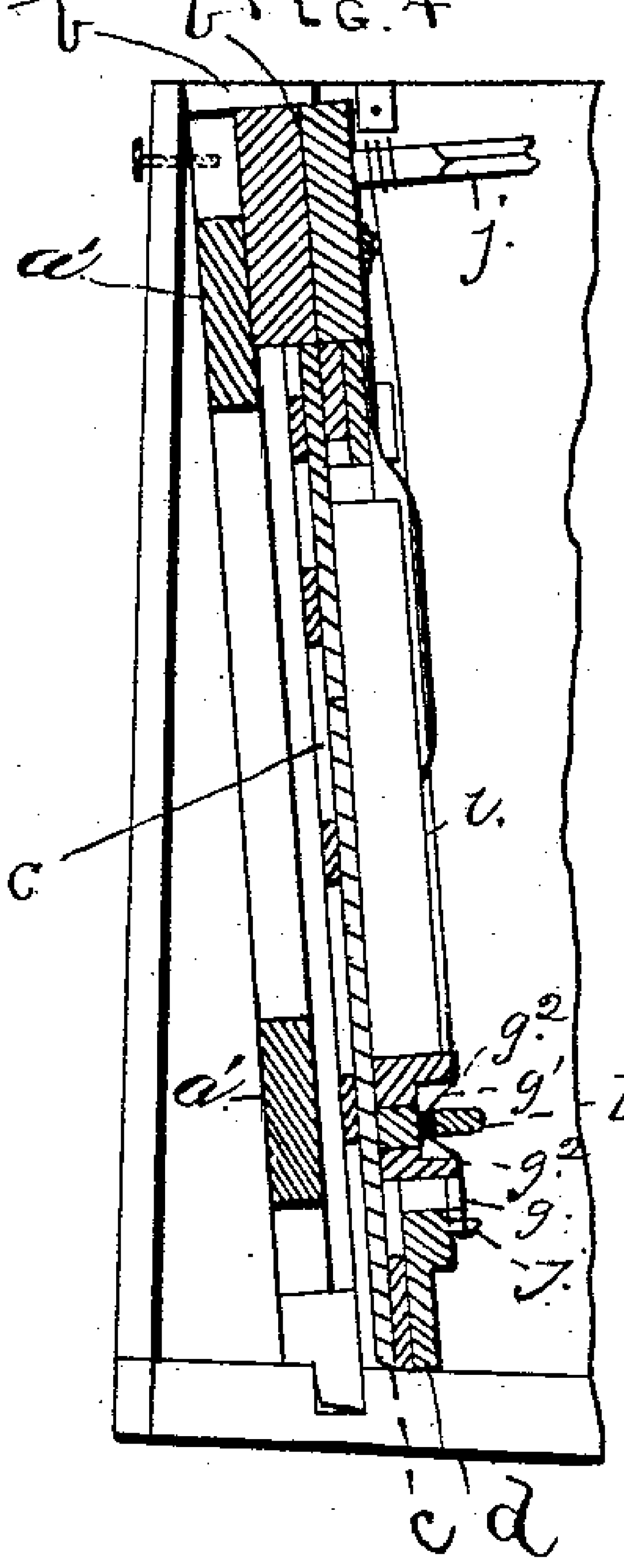


Fig. 5

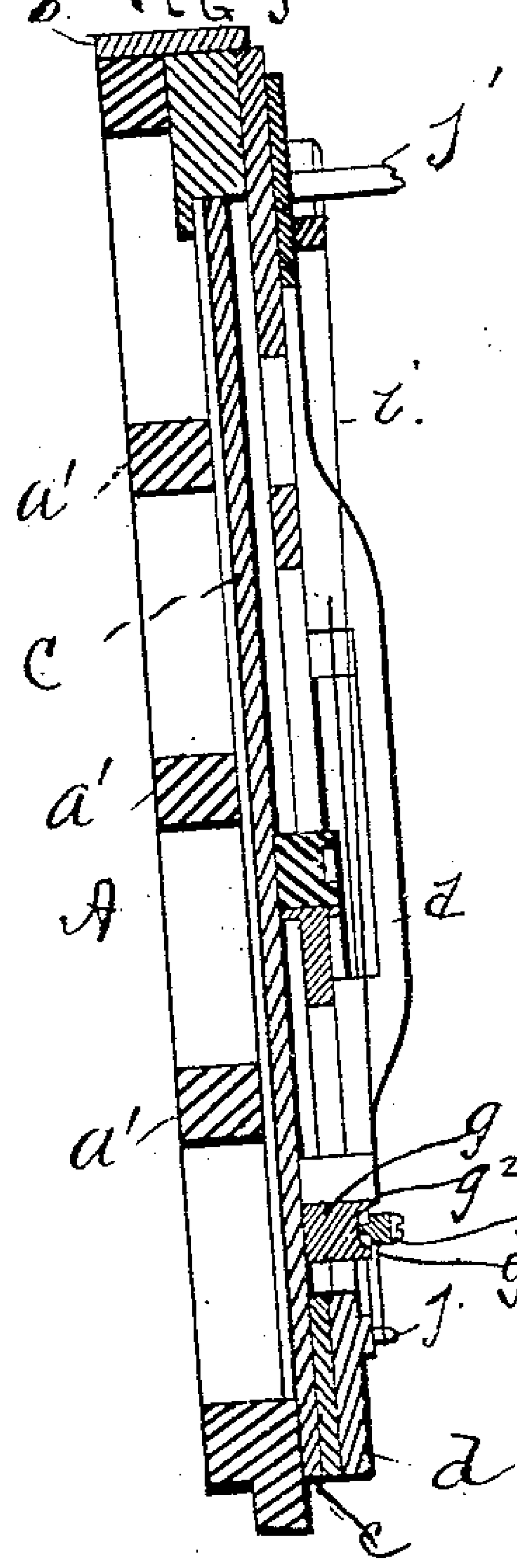
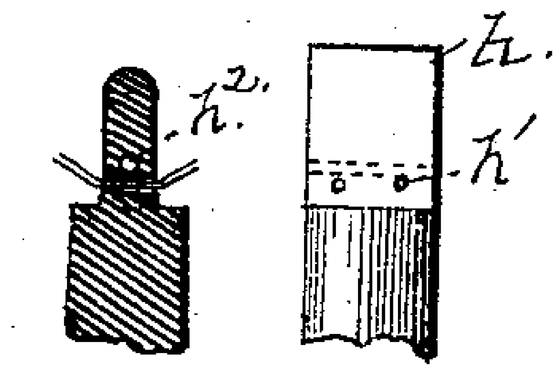


Fig. 6.



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JOSEPH R. PERRY, OF WILKES-BARRÉ, PENNSYLVANIA.

PIANO.

SPECIFICATION forming part of Letters Patent No. 292,580, dated January 29, 1884.

Application filed January 15, 1883. (Model.)

To all whom it may concern:

Be it known that I, JOSEPH R. PERRY, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Pianos; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in pianos; and it has for its object to secure a greater amount of vibration in mass for the sounding-boards of pianos by suspending them between the iron and wooden or other supporting-frames in such manner that all down-pressure of the strings is removed and at the same time each string is constantly held against the bridge, thereby holding the sounding-board free from contact with either frame, except where such contact is desirable, and also obviating the necessity of using any iron pins to hold the strings in place, as is usual.

It has for a further object to construct the iron and wooden frames in such manner that the said frames shall not come in contact with the casing and shall be removable therefrom for repairs or other purposes, as will be hereinafter fully described.

It consists in the construction, combination, and arrangement of the several parts, as will be hereinafter fully described, and specifically pointed out in the claims.

I have shown my improvement as applied to an upright piano, and will so describe it. It will be understood, however, that it is applicable to all forms of pianos, as well as to other similar musical instruments.

In the drawings, Figure 1 is a front, and Fig. 2 a rear, view of my piano-framing. Fig. 3 is an edge view of same. Fig. 4 is a section on line x x, Fig. 1, and Fig. 5 a section on line y y, Fig. 1; and Fig. 6 shows the agraffe in detail.

a is the base-rail, into which five or more upright posts, a', are mortised, to the upper end of which posts the wrest-plank b is firmly bolted and glued.

b' is a bar or plate of wrought-iron, which is bolted to the upper or front portion of the wrest-plank and into the tops of the upright posts a' a'. It is made about one-quarter to three-eighths inch thick by five to six inches wide, and is provided to give the wrest-plank great strength and prevent it from springing when drawing the overstrung bass-strings.

c is the sounding-board. It is secured to the wooden or supporting frame as follows: A portion, c', of the wrest-plank is projected down from its inner edge. The upper end of the sounding-board is rested on this part c', as most clearly shown in Fig. 3. The rear face of the sounding-board above the frame may be rendered free by arranging a long collar, e, which stands between the wooden and iron frames, as shown in Fig. 3. The fastening screw or bolt is passed through the collar e, as indicated in dotted lines, Fig. 3. The sounding-board may be cut away slightly to permit it to vibrate without touching the said collars. The construction shown, consisting of the ribs f made thicker at f' and arranged between the iron and wooden frames and the sounding-board, is a convenient mode of suspending the sounding-board. In order to admit the sounding-board to be thus suspended, it is necessary to string the instrument up in such manner that there will be no down-pressure of the strings on the board, and so that at the same time they will be held tightly to the sounding-board and the bridge. To accomplish this, I construct the bridge g with a groove, g', extending its entire length, leaving the projecting ridge g^2 on both sides, as shown. The bridge is mounted on the sounding-board, and is secured thereto by glue, or in any other suitable manner. I then make an agraffe, h, of hard maple or other suitable wood, provided with holes h', and pass a piece of wire, h^2, transversely through it immediately above the openings h', to prevent it from splitting under the tension of the string. These agraffes are secured in the groove g' in the bridge g, so that the holes h' will rest slightly below the top of the ridges g^2.

The strings i are secured to the hitch-pin j

and passed through the hole h', and secured at their other end to the wrest-pins j'. When the strings are drawn up in tuning, they lift on the agraffe h and press hard upon the ribs g^2, so as to equalize the lifting and depression on the sounding-board, and thus relieve the sounding-board. It will be seen that by this or similar means I can render any portion or the whole of the sounding-board free from contact with either frame except at the points where I desire such contact, and this is the main purpose for which I use the agraffe and ribs on the bridge, and by which I at the same time avoid all down-pressure on the sounding-boards. A similar result may be had by using the pressure-bar k, (shown clearly in Fig. 1,) which is secured in the groove g', with its under side arranged below the plane of the tops of ribs g^2, and the wire is passed under the bar k, as shown.

When the sounding-boards are glued and fastened along the edges of the piano-frame in the usual way, they will vibrate mostly along the center of the boards, while the sides and ends are held so firmly that no vibration can take place, and the vibrations are formed similar to those of a drum-head, which are greatest in the middle and diminish toward the edges, so that the strings on any part of a bridge coming close to such an edge will not sustain the same amount of vibration as those which lie along the middle portions, while by letting the whole board free or any parts where the bridge comes too close to the edge, as above described, the vibrations are equal over the whole board, and their amplitude is increased at the same time.

In order to render the instrument free from the casing, I contract the iron and wooden frames at the bottom, as shown, and project the ends of the base-bar a to rest on the outside casing, so that any twisting of the case by reason of an uneven floor will not affect the instrument.

The dotted lines in Fig. 2 indicate the case, which allows the instrument to be readily removed for any purpose desired.

The overstrung bass-strings are preferably secured to the bridge by the pressure-bar k on account of the loops which hold them to the hitching-pins, they being too large to pass through holes h' as with continuous or double strings. The depression or groove g' might be only formed where the wires cross the bridge, and the same result be obtained.

The wrest-plank b, it will be seen, is projected from the wooden framing a sufficient distance, so that when the iron frame is placed on the sounding-board it will abut against the under side of the wrest-plank and its outer surface will be flush with or slightly below the surface of the said plank, as shown in Figs. 3, 4, and 5.

When the strings are secured to the iron frame and to the wrest-plank, or the pins projected therefrom, their tendency will be to draw the frames firmly together, as will be readily understood in reference to the drawings.

The string-carrying frame, composed of the main or back frame A, the wrest-plank, the plate b', and the iron frame and sounding-board, is so constructed by contracting the bottom end as to be wholly separated from the casing, except at two points. The wrest-plank is cut so as to fit snugly between the ends of the casing, and the bottom sill, a, has its ends extended laterally to rest on suitable supports in the casing. The edges of the frames and sounding-board have a free space between them and the casing. The ends of the wrest-plank and plate b' are held into the casing by means of a stop, which is packed with cloth, to prevent any rattling or jarring by coming into direct contact with the casing, and thus also to produce a perfectly-free vibration. The back of the wrest-plank and the upright frame and posts are also held firmly by screws driven into them from the piano back, which is a separate frame, made to produce a covering to the frame-work, partially shown in the drawings, Fig. 4. It will be seen that by these means the instrumental part can be easily removed from the outer casing and as easily replaced, while the limited contact, by resting only on two points at the bottom, is much less liable to warp or twist the string-frame and throw the instrument out of tune by handling or by standing on uneven surfaces.

The wooden agraffe is employed for the purpose of avoiding metal devices in connection with the bridge and sounding-board, as any metal string-supports have a tendency to make a hard and short metallic tone; also for for the purpose of avoiding bridge-pins, usually driven in to hold the strings in place, several pounds of which are needed, and for the purpose also of producing a uniformity of molecular action and vibration through the substance of the bridge thus rendered free from metal.

In my improved agraffe I insert transversely to the stringing-holes a small piece of hard wood or a small metallic pin, so as to pass over the string-holes and form a support and prevent tearing or splitting the same. If a metal pin be used, the transverse hole is preferably made so that a small portion of the wood of the agraffe will intervene between the said pin and the strings, thus giving a wood bearing for the latter. It will be seen that this agraffe may be used either to press down on or to lift on the string by placing the transverse pin above or below the stringing-holes. It will be understood that this agraffe may be used as any of the ordinary metal agraffes, and that it can be set between one rib and a block, or between two bearing-blocks, instead of the concavity of the bridge shown in my drawings. My agraffe is fixed rigidly in place and sustains the weight or strain between the string and sounding-board. Thus I have provided a sounding-board almost entirely free from metallic fixtures and appliances.

It will be seen that the lower side of the wrest-plank b rests down on and against the iron frame, that the upper side of said plank is flush with the upper side of the wooden frame, and that the metallic plate b' is placed and secured firmly on the wooden frame and against the upper side of said wrest-plank. By this construction and arrangement the plank b is held firmly, as in a vise, between the iron frame and the metallic plate. Ordinarily, as is well known in the art, an upright piano is strung in such a manner that the treble and overstrung bass-wires, are carried from the opposite upper corners of the frame diagonally across the same to its lower corners. This causes a downward strain in the opposite corners of the wrest-plank, and has a tendency to bend said plank down on its opposite ends and to cause a slight bowing. This, it is thought, will be clearly understood on reference to the drawings, especially Fig. 1. To overcome and brace against this strain I provide the metallic brace b', which is bolted securely in position in the manner described, and brace the wrest-plank its full length, obviating the bending thereof, which is liable to occur in the manner described where such a brace is not provided.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a piano having the strain exerted on the opposite ends of the wrest-plank, substantially as described and shown, the combination, with the wooden frame, the iron frame mounted thereon, and the wrest-plank placed on the wooden frame, with its upper side flush with the upper side of the wooden frame, and its lower side abutted against the upper side of the iron frame, of a metallic brace-plate placed down against the upper side of the wrest-plank and the wooden frame, and secured rigidly to the wooden frame and against the wrest-plank, whereby the said wrest-plank is clamped firmly between the iron frame and the brace-plate, substantially as described, and for the purposes specified.

2. The agraffe made of wood and provided with string-openings, and a transverse re-enforcing pin passed through the body of said agraffe, in close proximity to the string-openings, substantially as and for the purposes set forth.

3. In an upright piano, a removable frame for carrying the strings, composed of a wooden frame having its upper end fitting into the outer casing and its edges tapered or drawn inward, whereby the main body of said frame, sounding-board, and iron frame are separated from the said casing, a wrest-plank fixed to the upper end of the frame, a sounding-board, an iron frame abutted against the wrest-plank and made to coincide with the form of the main frame, and a base, sill, or supporting-bar fixed to the lower end of the frame, and having its ends extended to rest on supports in the outer casing, as set forth.

4. In an upright piano, a string-frame having its upper end fitting snugly within the outer casing, and having its lower end made narrow, and having the ends of its base or sill piece extended outward to provide supports, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

JOSEPH R. PERRY.

Witnesses:
ADAM BOGERT,
JACOB BATZ.