3 Sheets—Sheet 1.

# C. F. CHICKERING.

## Piano Fortes.

**No. 197,332.** **Patented Nov. 20, 1877.**

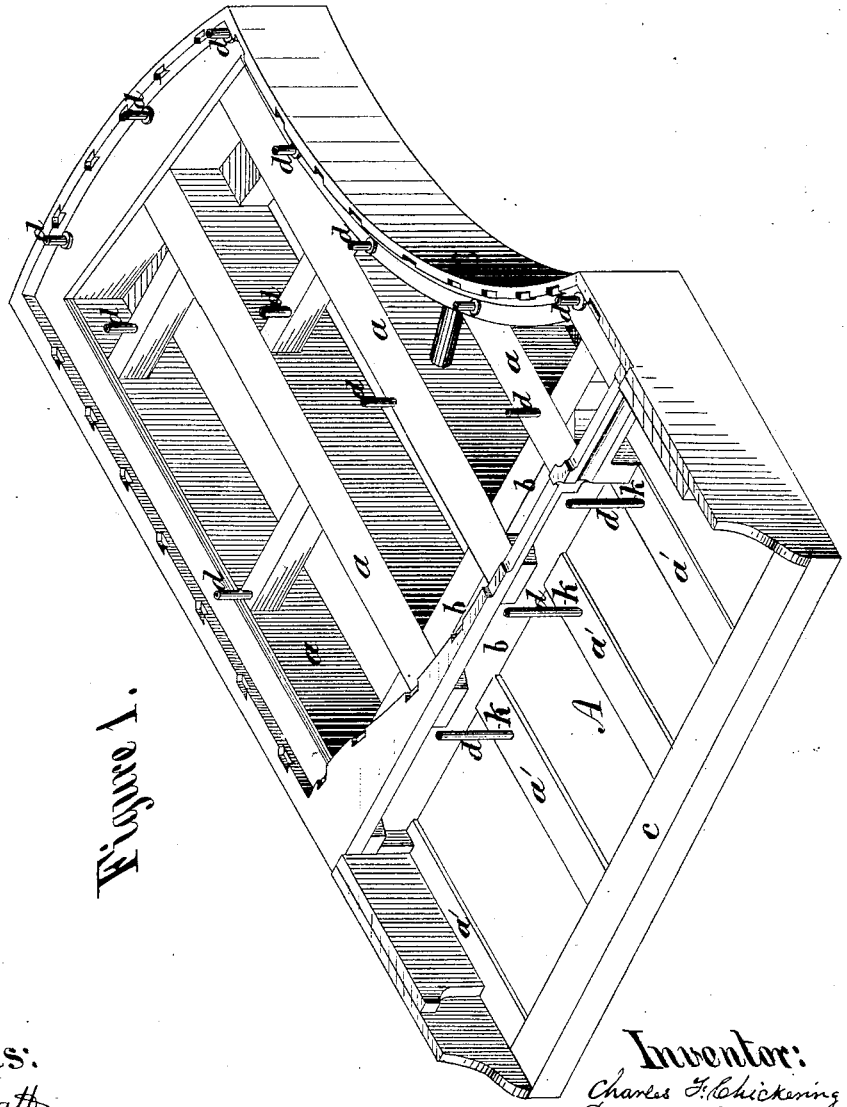


Figure 1.

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## Piano Fortes.

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Figure 2.

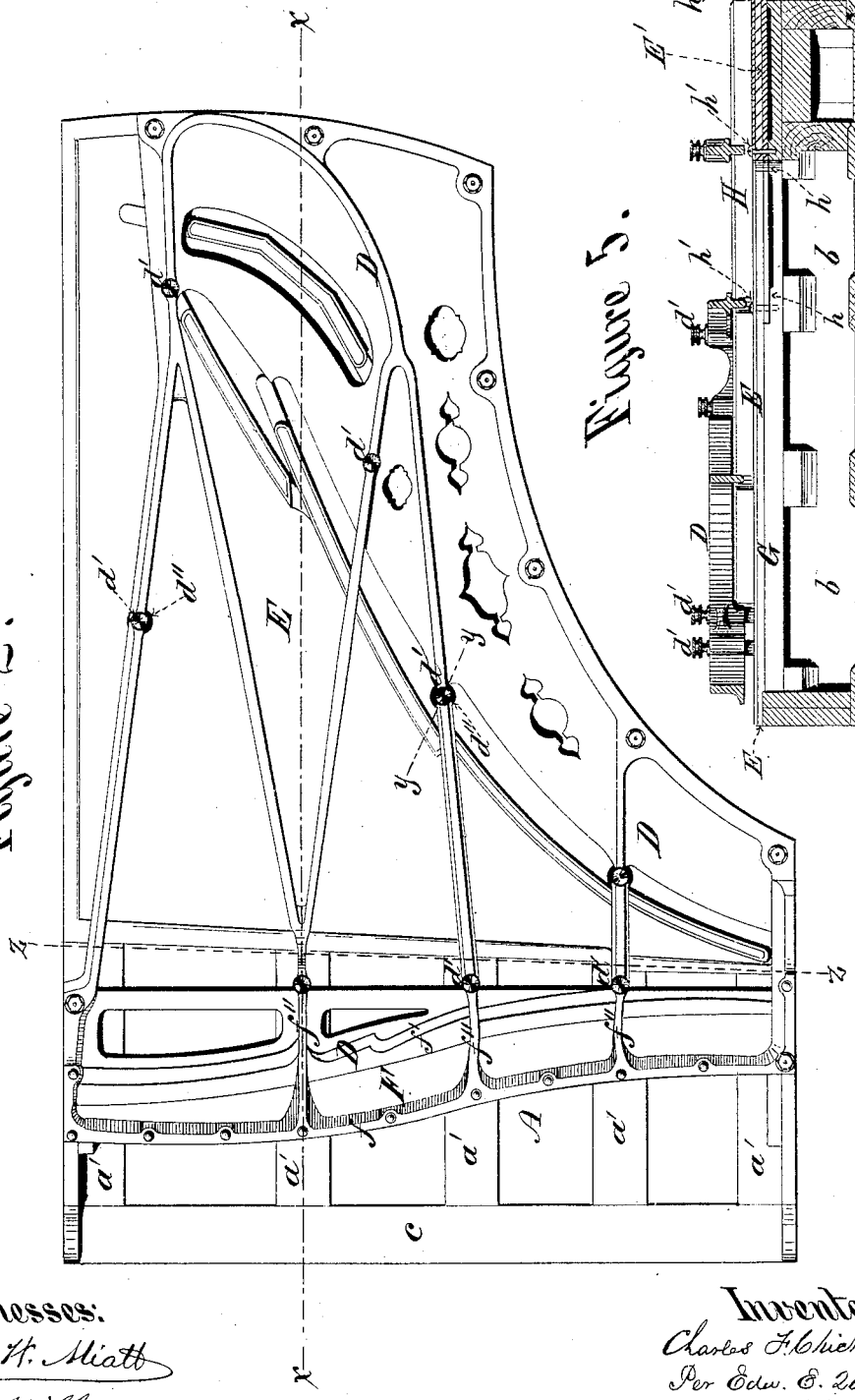
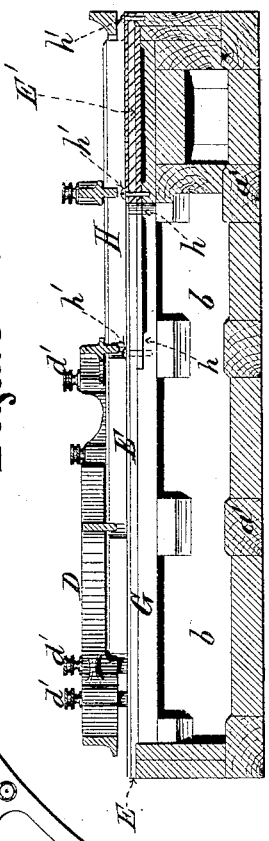



Figure 5.

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3 Sheets—Sheet 3.

# C. F. CHICKERING.

## Piano Fortes.

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Figure 3.

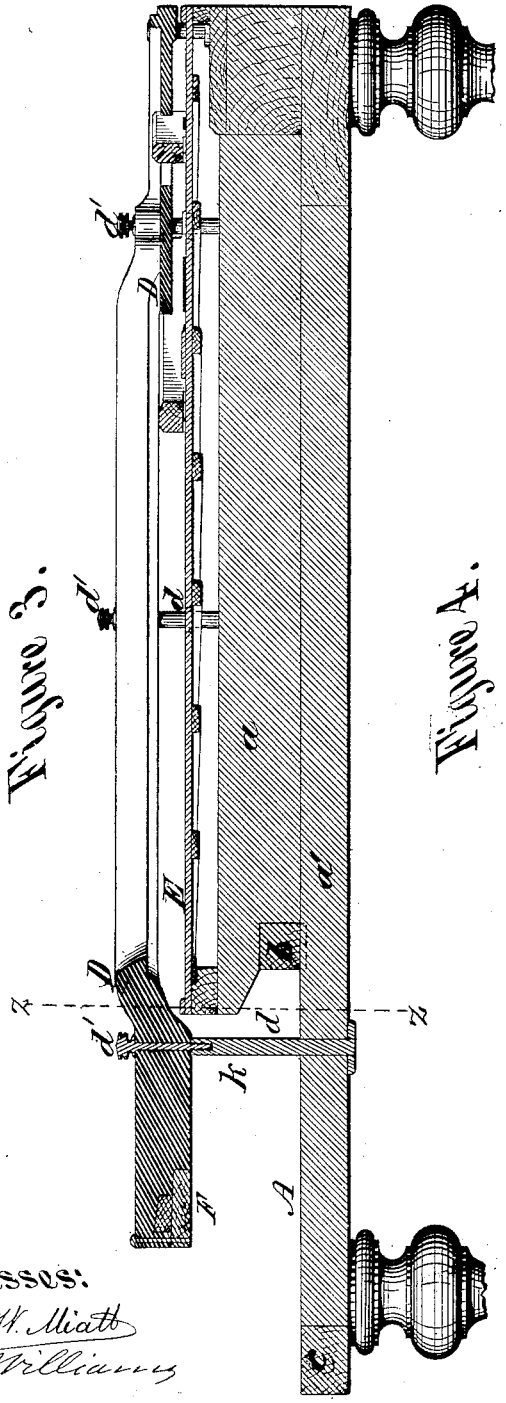
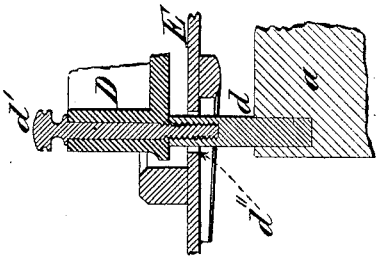



Figure 4.

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# UNITED STATES PATENT OFFICE.

CHARLES F. CHICKERING, OF NEW YORK, N. Y.

## IMPROVEMENT IN PIANO-FORTES.

Specification forming part of Letters Patent No. **197,332,** dated November 20, 1877; application filed September 3, 1877.

*To all whom it may concern:*

Be it known that I, CHARLES F. CHICKERING, of the city and State of New York, have invented certain Improvements in Grand Pianos, of which the following is a specification:

My improvements relate, first, to the construction of the wooden bed or skeleton of a grand piano; second, to the mode of supporting the cast-iron frame upon the bed, whereby the sounding-board is kept out of contact with any portion of the iron frame, or with its metallic connections, and whereby the front supports of the frame are brought nearer to the agraffes; third, in extending the longitudinal braces of the cast-iron frame across the opening which receives the wrest-plank to the front transverse rib of the frame; and, fourth, in the manner of attaching the sounding-board to the belly-rail, whereby the treble portion is left free to vibrate.

The first part of my invention consists in extending the longitudinal wooden strips of the bed or skeleton forward under the key-board to the front rail of the bed. This I may effect by making the longitudinal wooden strips of a single piece of wood of sufficient depth to reach to the top of the belly-rail and extend a sufficient distance below the belly-rail to afford the necessary amount of material for the portion which projects forward underneath the key-board to the front rail of the bed; or, I may make the longitudinal strips of the same depth as the belly-rail, and glue to the bottom thereof another strip of sufficient length to reach from the front to the rear end of the piano. In either event, the longitudinal strips are halved or mortised into the belly-rail.

The second part of my invention consists in supporting the iron string-frame of the piano upon pillars firmly secured in the wooden bed, and projecting vertically upward a sufficient distance to hold the iron frame above and clear from the sounding-board. Those of the pillars which occur where the sounding-board is located pass through holes therein made larger in diameter than the diameter of the pillars. There is, therefore, no contact of the sounding-board with the iron frame or with the pillars which support it.

The iron frame is secured in position by screws, which are engaged in holes tapped into the upper ends of the pillars. The front series of pillars is arranged in front of the belly-rail instead of being in the belly-rail, and the front bearing is therefore nearer the agraffes, and tends to stiffen the structure and enable the frame to more effectually resist the strain of the strings.

The third part of my invention consists in extending the horizontal ribs of the casting across the seat of the wrest-plank to the front transverse rib of the frame, which is thus strengthened, so that the upper part of the wrest-plank may be tightly inclosed between the front rib, which projects downward in front of the wrest-plank, and the inner transverse rib, which affords the inner bearing for the wrest-plank.

The fourth part of my invention consists in stiffening the front edge of the treble or upper portion of the sounding-board, and in attaching it to the belly-rail at intervals only, whereby the treble portion of the sounding-board is made more free to vibrate, and the tone of the instrument is equalized and improved.

The accompanying drawings, illustrating my improvements, are as follows:

Figure 1 is an isometrical perspective of the wooden bed of a grand piano. Fig. 2 is a top view of the piano, with the cover removed, showing the iron frame, the sounding-board, &c., secured in position upon the wooden bed. Fig. 3 is a longitudinal vertical section of the instrument through the line *x x* on Fig. 2. Fig. 4 is a vertical section through the line *y y* on Fig. 2, showing, upon an enlarged scale, a portion of the sounding-board and one of the pillars to which the iron frame is secured; and Fig. 5 is a transverse vertical section through the line *z z* on Figs. 2 and 3.

Referring to the drawings, it will be seen that each longitudinal brace *a a'* of the wooden frame or bed A of the piano extends forward in front of the belly-rail *b* to the front transverse rail *c* of the bed.

The longitudinal braces *a a'* may be made of a single piece of timber of the requisite depth, or of two separate pieces, as shown in Fig. 3, the upper and shorter piece *a* being halved onto the belly-rail *b*, and the lower and

longer piece *a'* being glued to the under side of the shorter piece *a*, and being of sufficient length to extend forward to the front transverse rail *c*. This extension of the longitudinal braces forward to the front rail of the bed greatly strengthens the structure.

The cast-iron frame D of the piano rests upon the upper ends of the iron pillars *d*, which are firmly fixed in the wooden bed, and project vertically therefrom to a sufficient height to raise the iron frame clear above the sounding-board E. The iron frame is secured to the pillars by means of the screw-bolts *d'*, which pass through the frame, and are received in holes tapped into the upper ends of the pillars *d*. Those of the pillars *d* which pass through the sounding-board pass through holes *d''* in the sounding-board, which are larger in diameter than the diameter of the pillars. There is thus no contact of the sounding-board with the metallic frame or pillars, and it is, therefore, enabled to vibrate free from any effect which might be produced by its contact with metal.

It will be seen that the pillars *k k k* are arranged some distance in front of the belly-rail, and therefore near the agraffes, in the position where they contribute more effectually to stiffen the frame.

The wrest-plank F is inserted between the front transverse ribs *f* and *f'* of the cast-iron frame. The front transverse rib *f* is strengthened, to resist the strain which might result from the swelling of the wrest-plank, by its connection with the longitudinal ribs *f'' f'' f''* of the frame, which extend over the wrest-plank from the inner portion of the casting to the front rib *f*. By thus strengthening the front rib I am enabled to fit the wrest-plank very closely to its bearings in the frame, and drive or press it into the seat between the ribs *f* and *f'*. By thus rigidly griping the wrest-plank, danger of splitting it in driving the wrest-pins is wholly avoided.

The ordinary mode of fastening the front edge of the sounding-board is to glue it to the top of the belly-rail, as shown at G in Fig. 5.

As the upper or treble portion of the sounding-board is of small area, its capacity to vibrate is greatly diminished by the rigidity with which it is held.

In order to give the upper portion of the sounding-board more freedom to vibrate, I have devised the mode of construction shown at H in Fig. 5, in which it will be seen that the upper portion of the sounding-board, instead of having its front edge glued to the top of the belly-rail, has its front edge supported upon one or more piers, *h*, and secured thereto by the screws *h'*. Thus the greater portion of the front edge of the upper part of the sounding-board is unconfined, and vibrations are more easily generated therein, and when generated are more persistent than they are when the entire edge of the sounding-board is rigidly affixed to the belly-rail.

In order to strengthen that portion of the edge of the sounding-board which is thus left unsupported, I re-enforce it with the strip E'.

If desired, the entire front edge of the sounding-board may be provided with the re-enforcing-strip E', and may be supported at intervals upon piers, instead of being glued to the belly-rail. This mode of construction, however, is of greater importance in the case of the upper portion of the sounding-board. By means of it the upper notes of the piano are greatly improved in their singing quality, sweetness, and volume.

I claim as my invention in a grand piano, substantially such as described—

1. The longitudinal wooden braces *a* of the bed, provided with the extensions *a'*, reaching forward from the junction of the braces with the belly-rail *b* to the front rail *c* of the bed, substantially as and for the purpose set forth.

2. The metallic string-frame D, supported upon and secured to the pillars *d*, projecting vertically from the wooden bed, as and for the purpose described.

3. The longitudinal ribs of the metallic frame, extending forward to the transverse rib *f*, projecting downward in front of the wrest-plank, and constituting the connections *f''* with the inner transverse rib *f'*, as and for the purpose set forth.

4. The pillars *k k k*, arranged in front of the belly-rail, as shown, in combination with the front portion of the iron frame, substantially as and for the purpose described.

5. The sounding-board E, the treble or upper portion of which is provided at its front edge with the re-enforcing-strip E', in combination with one or more piers, *h*, by which the desired portion of the front edge of the sounding-board is supported, substantially as and for the purpose set forth.

CHARLES F. CHICKERING.

Witnesses:
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WM. P. LINCOLN.