

C. F. T. STEINWAY.

Improvement in Piano-Fortes.

No. 127,383.

Patented May 28, 1872.

Fig. 1.

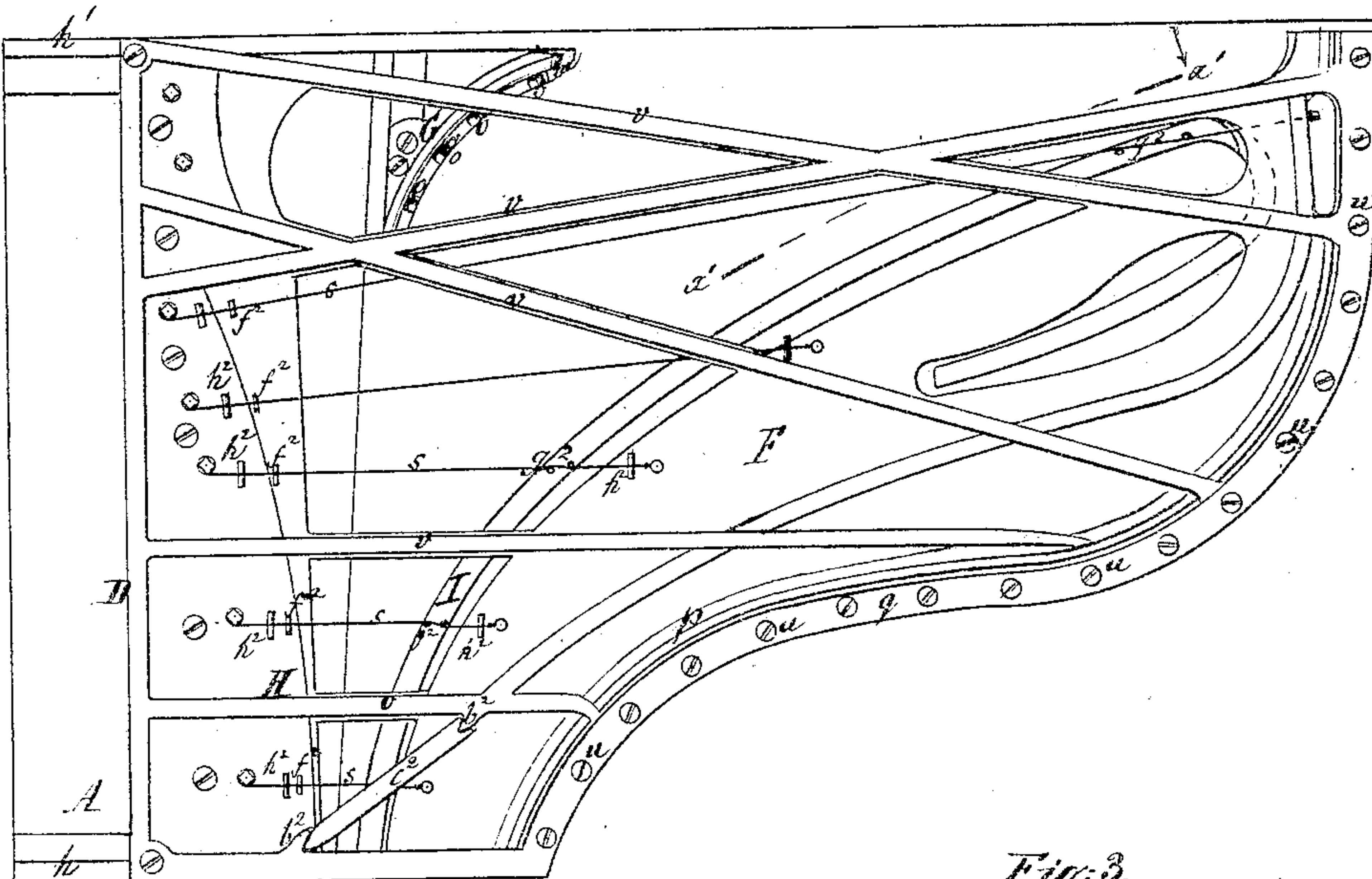
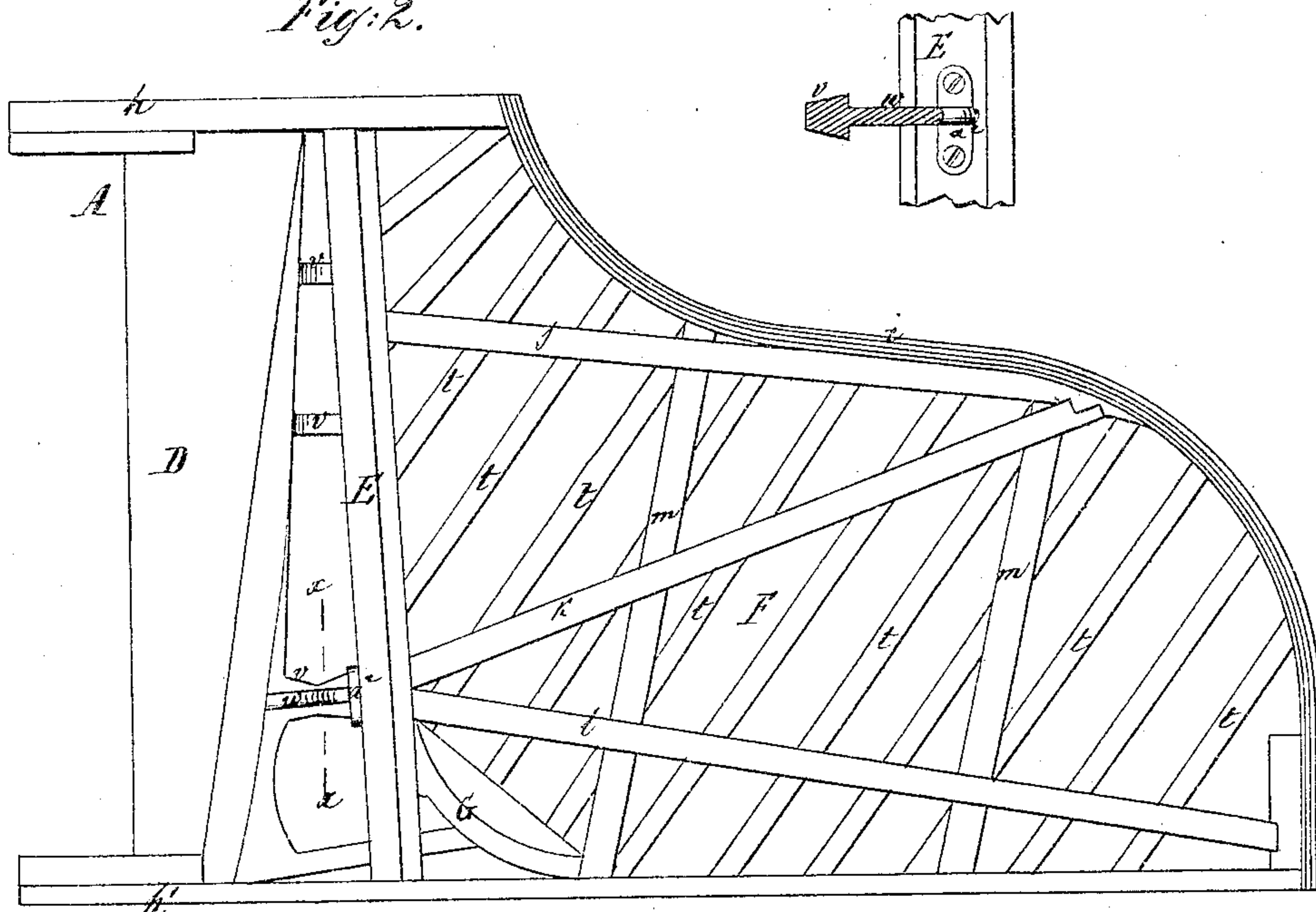


Fig. 3.

Fig. 2.



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Fig. 6.

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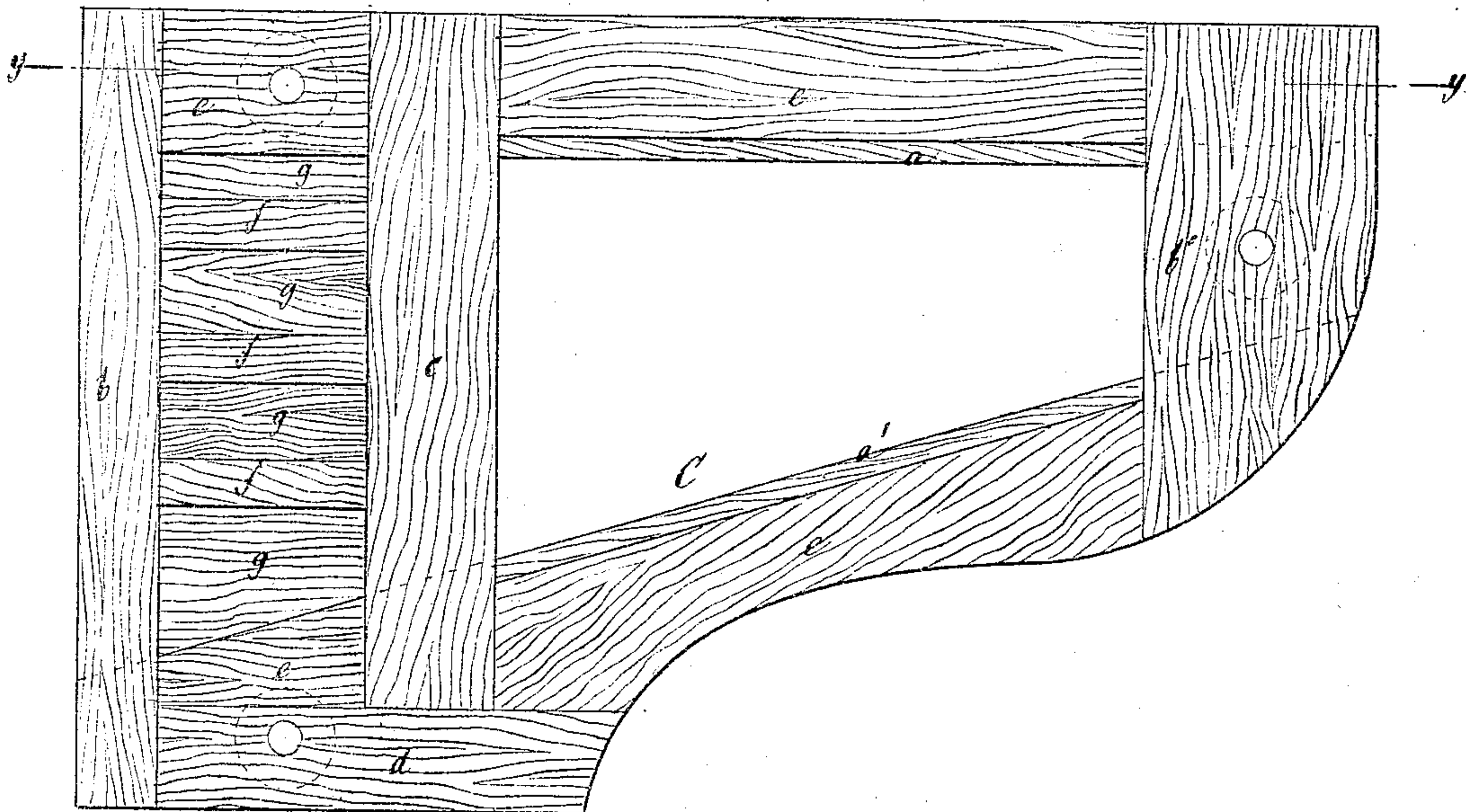


Fig. 7.

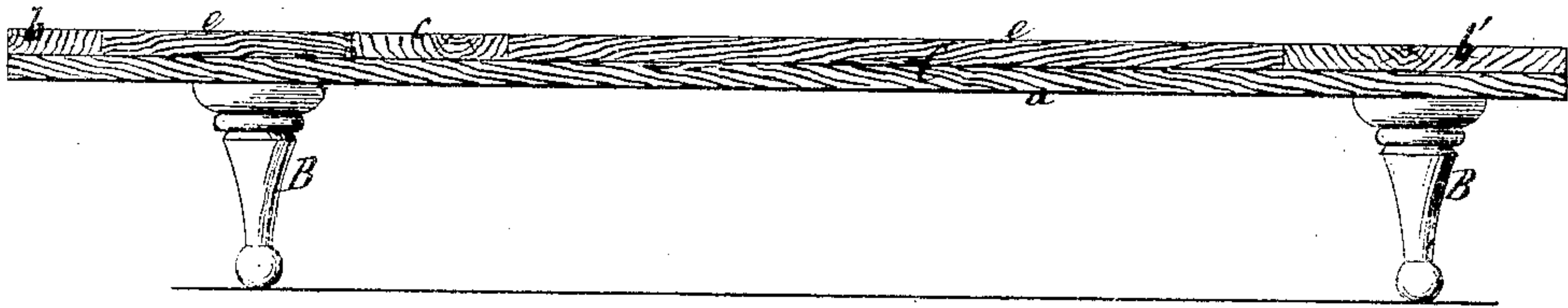


Fig. 4.

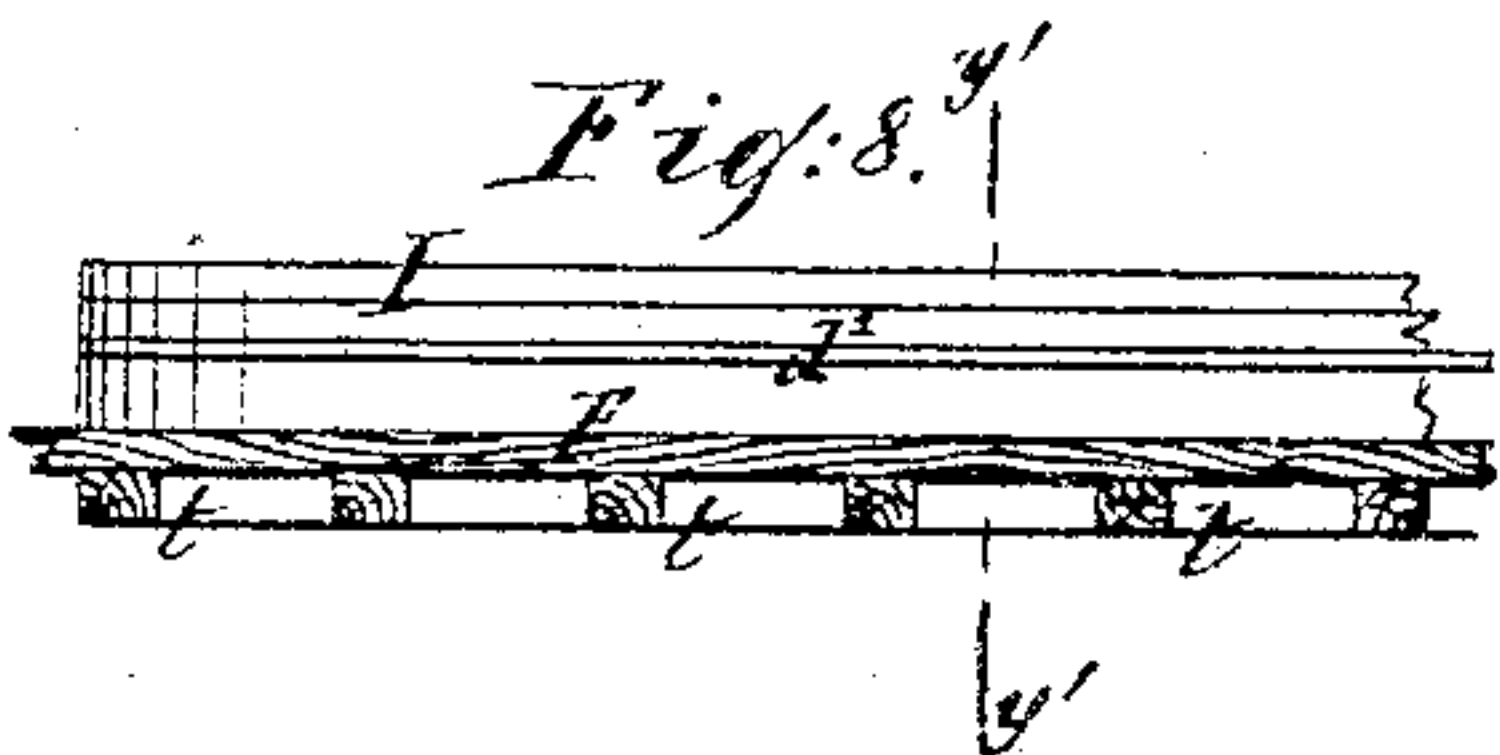
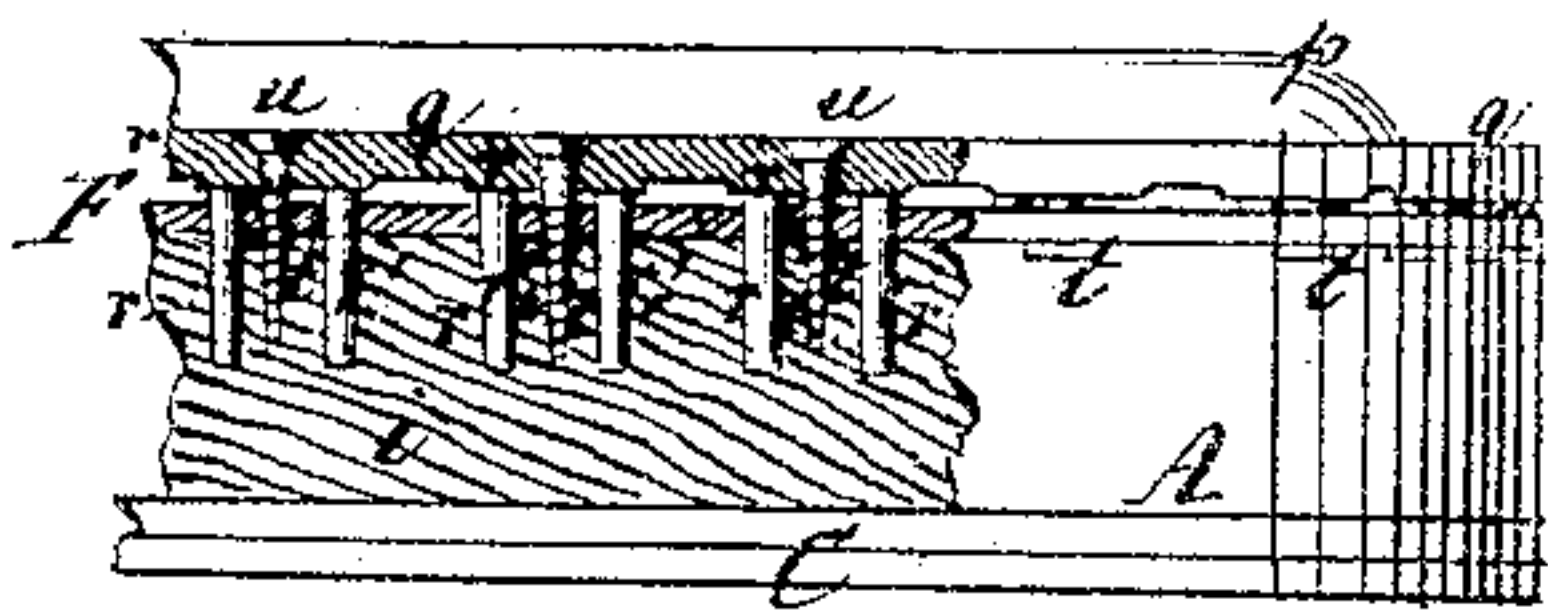
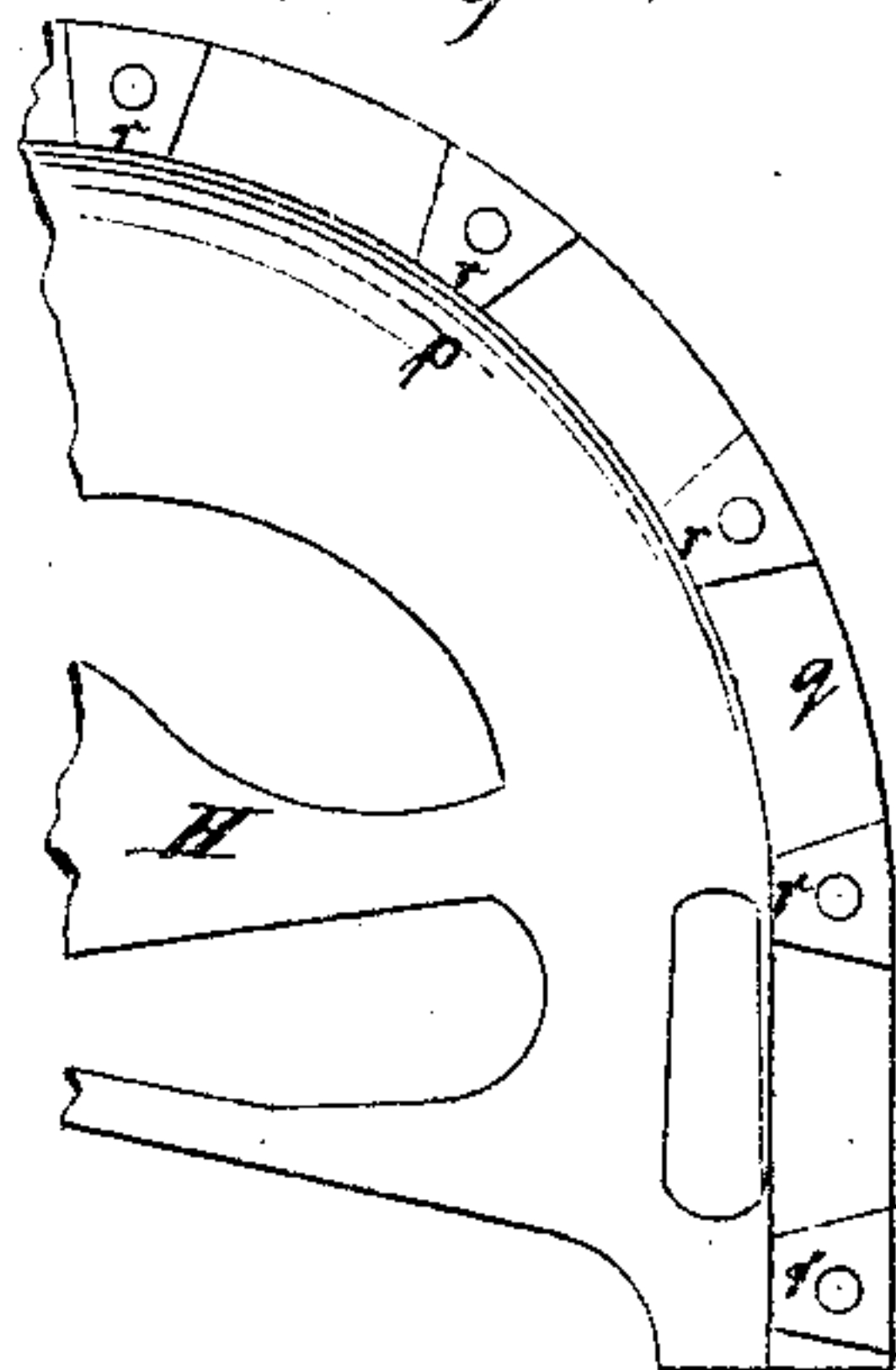


Fig. 5.



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UNITED STATES PATENT OFFICE.

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IMPROVEMENT IN PIANO-FORTES.

Specification forming part of Letters Patent No. 127,383, dated May 28, 1872.

To all whom it may concern:

Be it known that I, C. F. THEODOR STEINWAY, of the city, county, and State of New York, have invented a new and useful Improvement in Piano-Fortes; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification, in which drawing—

Figure 1 represents a plan or top view of a grand piano-forte constructed according to my invention. Fig. 2 is an inverted plan of the same, the bottom of the case having been removed. Fig. 3 is a transverse section of one of the wedge-braces of my metal frame in the plane $x x$, Fig. 2. Fig. 4 is a sectional end view of my metal frame and the parts supporting the same. Fig. 5 is an inverted plan of the metal frame detached. Fig. 6 is a plan of the bottom of my case detached. Fig. 7 is a longitudinal section of the same in the plane $y y$, Fig. 1. Fig. 8 is a section of the sounding-board in the plane $x' x'$, Fig. 1, showing the construction of my sounding-board bridge. Fig. 9 is a transverse section of the same in the plane $y' y'$, Fig. 8.

Similar letters indicate corresponding parts.

This invention relates to a piano-forte the metal frame of which is arched at its ends and provided with a flange, which serves to fasten the same down to the wooden frame.

On the under surface of this flange are formed projections, which rest on dowels secured in the frame supporting the sounding-board, and extending above the surface of said sounding-board, so as to leave the sounding-board free to vibrate without coming in contact with the metal, while, at the same time, the metal frame is firmly supported.

From the inner surface of the wrest-plank part of my metal frame project one or more brackets, each forming the bearings for a metal wedge which bears against wooden braces bearing against the outer rim of the wooden frame supporting the sounding-board, whereby the metal frame is strengthened against the tension of the strings. The metal frame on its upper surface is provided with lugs for the reception of a metal wedge-bar, which extends obliquely over the treble-strings

and assists in strengthening the frame against the tension of the strings.

The bed-plate or bottom of my wooden case is formed of two thicknesses of wood, the lower layers of which extend, in a longitudinal direction, from one end of the bed-plate to the other, while the lower transverse layers are secured between them, the upper transverse layers extending across the lower longitudinal layers in such a manner as to produce a bed-plate very light, and yet of great strength, and capable of resisting the pull of the strings.

In the drawing, the letter A designates the wooden case of a grand piano-forte constructed in the usual manner, and supported by legs B. The bottom or bed-plate C of this case is shown in Figs. 6 and 7. It is constructed of two layers of wood, which are fastened to each other in the following manner: The lower layer consists of two strips, $a a^1$, which extend throughout the entire length of the bottom on its sides, and the ends of which are connected by the lower cross-strips fastened between them, and by the upper transverse end strips $b b^1$, which extend across them, as shown in Fig. 6. In addition to the upper transverse end strips $b b^1$ a secondary transverse strip, c , is fastened on the lower longitudinal strips $a a^1$; but this secondary transverse strip abuts on one end against a longitudinal strip, d , which rests upon the lower longitudinal strip a^1 . Between the upper transverse strips $b c$ and $c b^1$ are inserted longitudinal side strips $e e e e$, and, in addition to these, I connect the transverse strips $b c$ by intermediate longitudinal strip $f f f$, the interstices between these last-named strips being filled out by panels g . By these means a bottom is obtained which combines superior lightness with great power of resistance against the tension of the strings.

The construction of my case will be best understood by referring to Fig. 2, which shows an inverted plan of the same when its bottom has been removed. The rim of this case is composed of rectilinear timbers $h h^1$ and a curved part, i , which latter part is, by preference, made of a number of layers of veneers glued on each other and pressed in the desired forms. On the rectilinear timbers $h h^1$ of the case is secured the wrest-plank D, and inside of this wrest-plank said timbers are

connected by a cross-bar, E, which, together with the edge of the case, forms the support for the sounding-board F. Between the cross-bar E and the rim of the case I apply three longitudinal braces, $j k l$, two of which converge toward one point of said cross-bar, as shown in Fig. 2, while the third passes from this cross-bar to the curved portion of the rim. With these longitudinal braces and the rim are combined two or more cross-braces, $m m$. The sounding-board F is fastened to the top edge of the case A, and of the cross-bar E, by means of glue or in any other desirable manner, and it is exposed to the action of compressing-screws o , which screw into the edge of the sounding-board, (see Fig. 1,) and the heads of which bear against a metallic bridge, G, extending from the cross-bar E to one of the cross-braces m . H designates the metal frame, which is made arched or with a curved edge, p , from which projects a retaining-flange, q . (See Figs. 4 and 5.) This flange extends over the curved portion of the rim of the case A, and it is provided on its under surface with projections r , which bear on dowel-pins r' rising from the rim of the case A through the sounding-board, and projecting somewhat above the surface of the same. By means of these dowel-pins the metal frame is kept out of contact with the sounding-board, leaving the sounding-board free to vibrate without obstruction by the metal. Said dowel-pins are arranged in pairs close to the edges of the ribs t of the sounding-board, and they assist in giving strength to the connection between the sounding-board and the case A.

By means of these dowel-pins the metal frame can be readily adjusted in position, so that the same will be supported uniformly at all points, since said dowel-pins can be readily shortened and adapted to the formation of the flange q of the metal frame.

The front end of the metal frame is firmly screwed down upon the wrest-plank D, and this front end connects with the arched rear portion thereof by means of a series of connecting-bars, v . (See Fig. 1.) From the under surface of the front part of the metal frame project one or more brackets, w , one being shown in Fig. 2; and if the metal frame is in position this bracket is opposite to the point toward which the longitudinal wooden braces $k l$ of the case A converge. By inserting a metallic wedge, a^2 , between the end of the bracket w and the cross-bar E, the metal frame is materially strengthened against the tension of the strings. On the treble end of my metal frame are cast two lugs, b^2 , for the reception of a wedge-bar, c^2 , which is driven in after the strings have been adjusted, and which serves to strengthen the metal frame against the tension of the strings. It will be noticed that the object of this treble-wedge is the same as that of the treble-bar described in my patent No. 97,982, and forming the subject-matter of the third clause of the claim in said patent.

By using a loose wedge-bar in place of said treble-bar, the operation of adjusting the treble-strings on the hitch-pins is materially facilitated, since this purpose can be easily effected before the wedge is inserted.

The strings in their course from the hitch-pins to the tuning-pins bear on the sounding-board bridge I, which is provided with a strip, d^2 , of brass or other metal, (see Figs. 8 and 9,) that may be secured to either side or to the top of the bridge, or which may be let into the bridge, as shown.

A flat strip of metal or a piece of metal wire may be used for this purpose. By this piece of metal the quality of the bridge to transmit the vibrations of the strings to the entire sounding-board, or to that portion of the sounding-board supporting said bridge, is materially increased, and the tone of the instrument is improved.

The strings s of my piano-forte are supported between the agraffes f^2 and the tuning-pins and between the bridge-pins g^2 , and the hitch-pins by bridges h^2 , which I term the "nodal" bridges, and which are adjusted at points corresponding to one of the nodes of the strings.

By embodying the above-described features in a piano-forte I am enabled to reduce the size of the instrument, while the tone retains its full strength, or is rendered even superior in strength and brilliancy to that of instruments constructed according to my former patents; and, furthermore, the cost of my new instrument is materially decreased.

These improvements are designed principally for grand piano-fortes, but most of them are applicable to upright and also square piano-fortes.

What I claim as new, and desire to secure by Letters Patent, is—

1. The bed-plate C for the case of a piano-forte, constructed of longitudinal bottom strips $a a^1$, transverse top strips $b b^1 c$, and longitudinal top strips $d e e f$, all combined in the manner herein shown and described.

2. The arched edge p and flange q on the metal frame H of a piano-forte, substantially as set forth.

3. The projections r on the flange q of the metal frame H, substantially as described.

4. The supporting dowels $r' r'$ secured in the rim of the wooden case A, in combination with the metal frame and sounding-board of a piano-forte, substantially as set forth.

5. The bracket w and wedge a^2 , in combination with the metal frame H and with the converging braces $k l$ of the wooden case A, substantially as described.

6. The treble-wedge c^2 and lugs b^2 upon and in combination with the bar v and outside border of the frame H, substantially as described.

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