

(No Model.)

2 Sheets—Sheet 1.

C. F. T. STEINWAY.
Upright Piano Forte.

No. 230,354.

Patented July 20, 1880.

Figure 1.

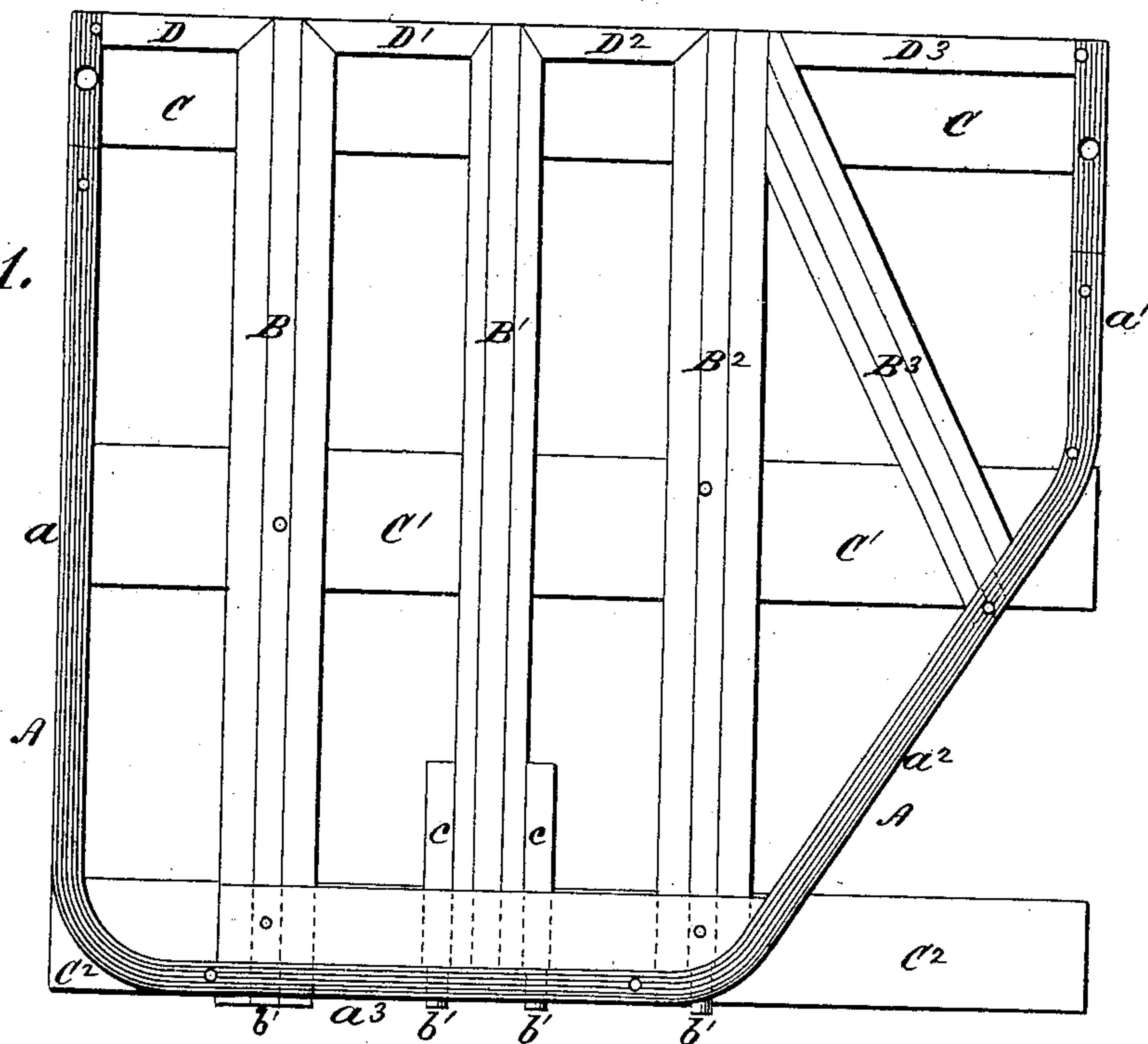
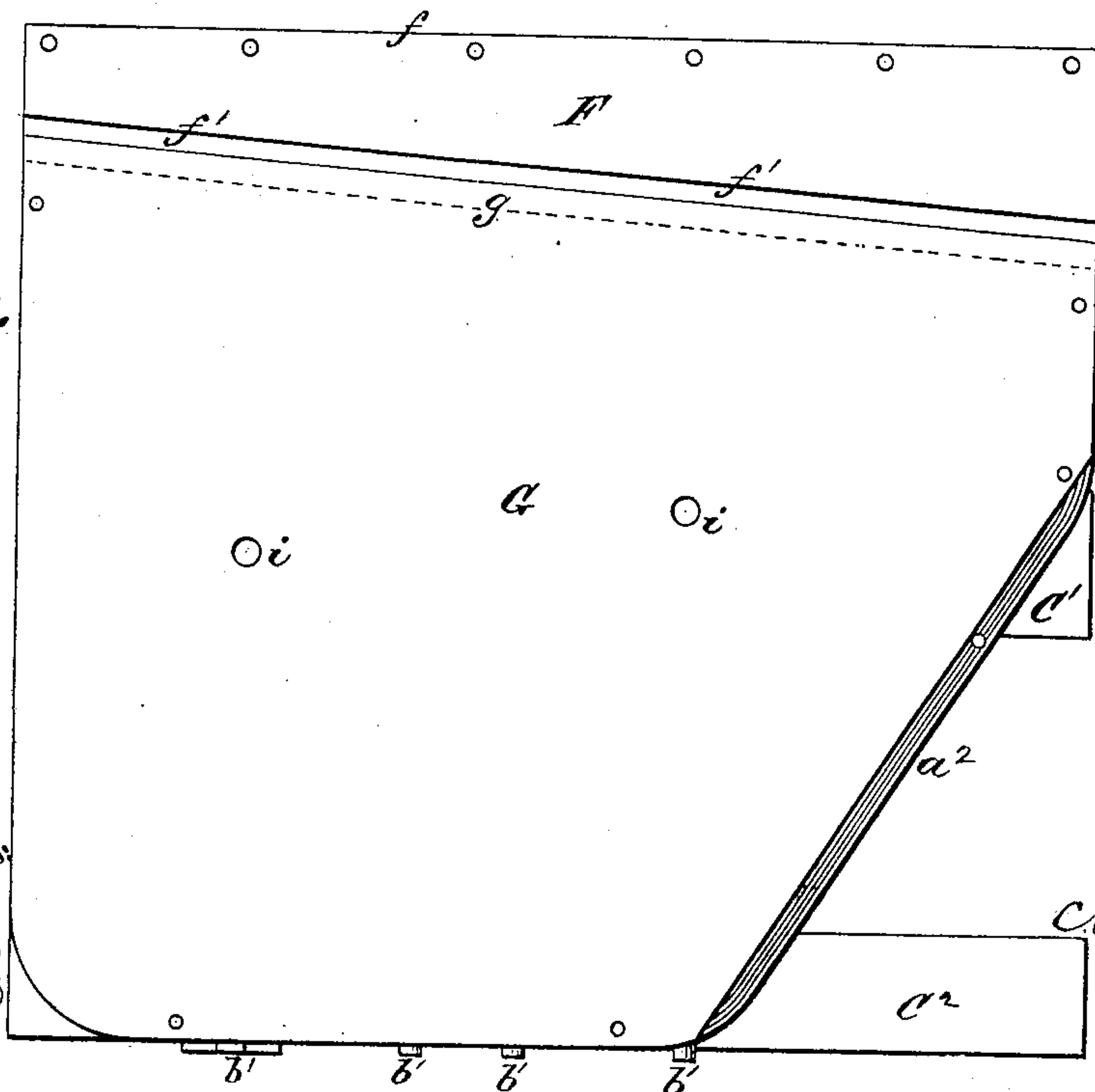


Figure 2.



Witnesses:
Asa Farn.
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per
Edw. O. Loomis
Atty.

(No Model.)

2 Sheets—Sheet 2.

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Figure 3.

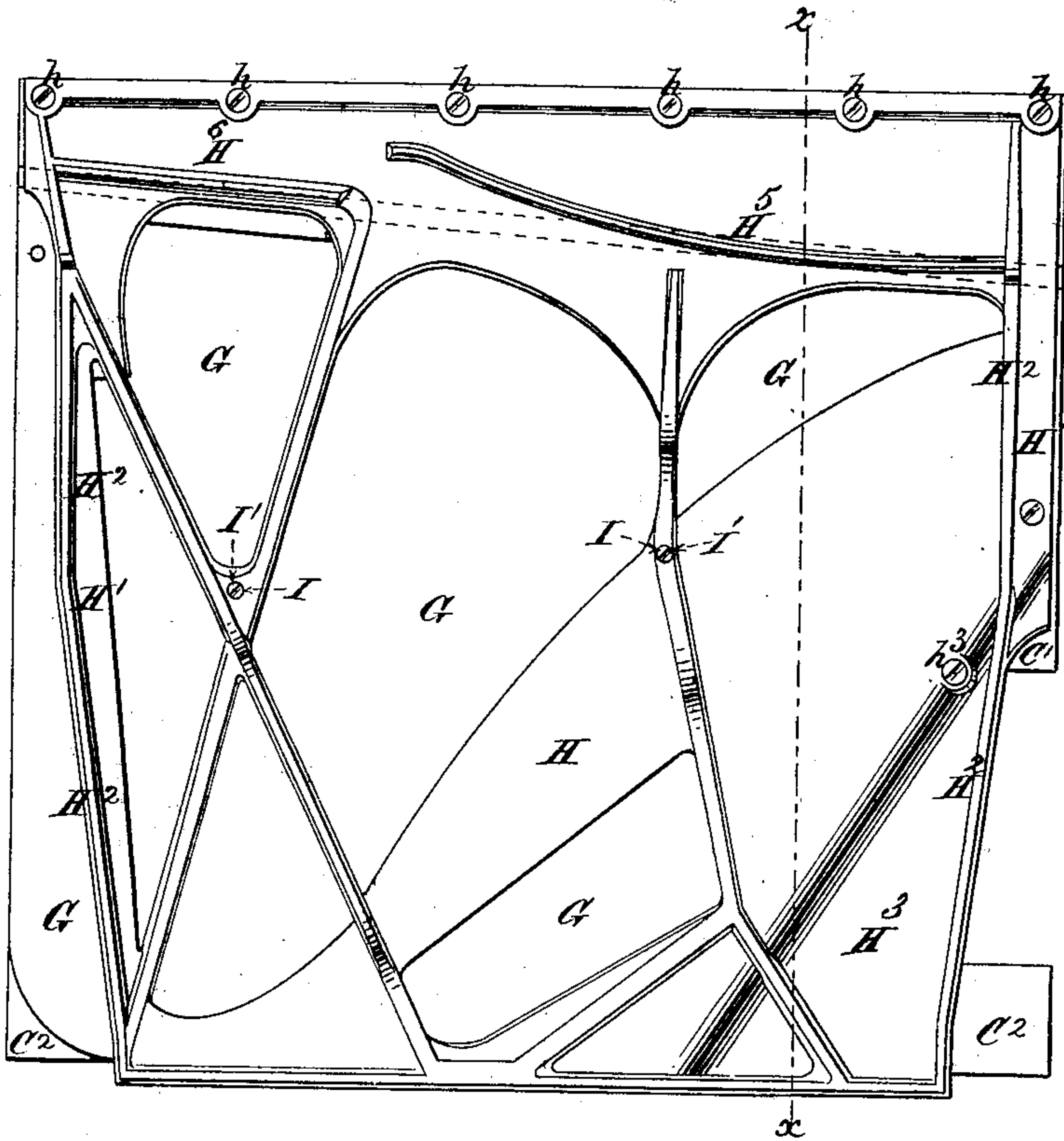


Figure 4.

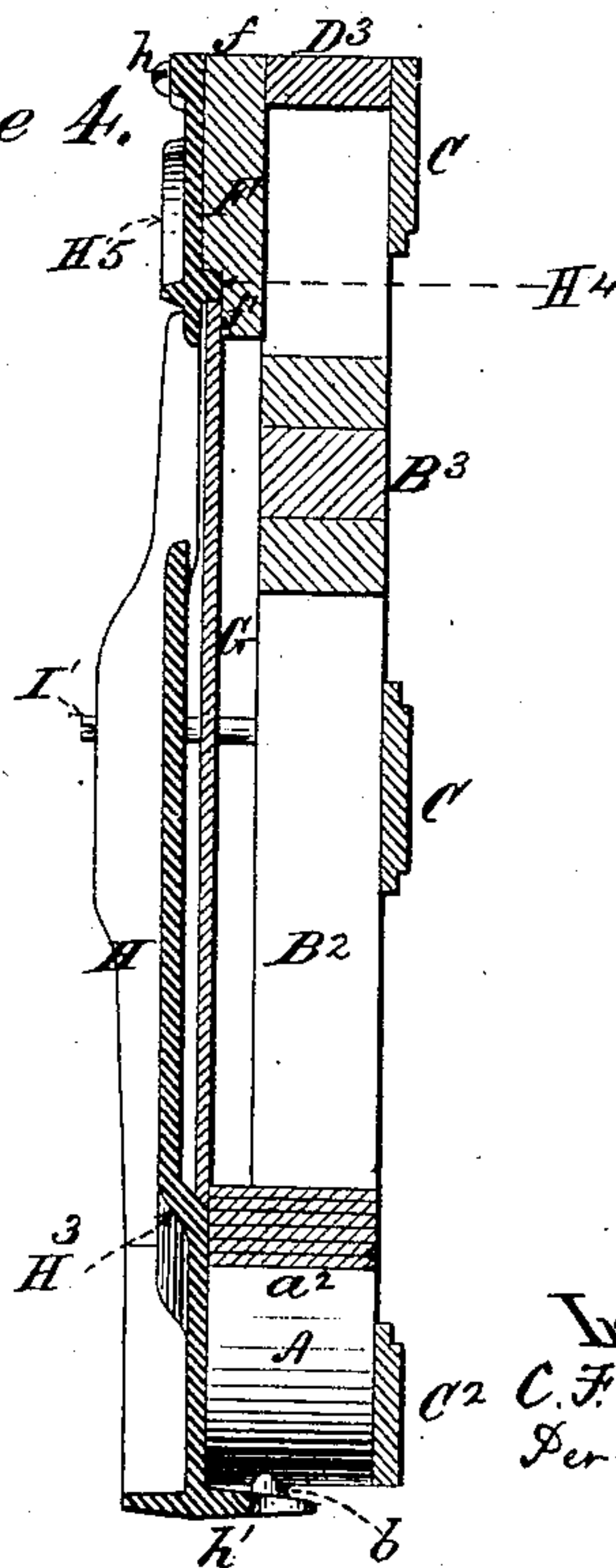
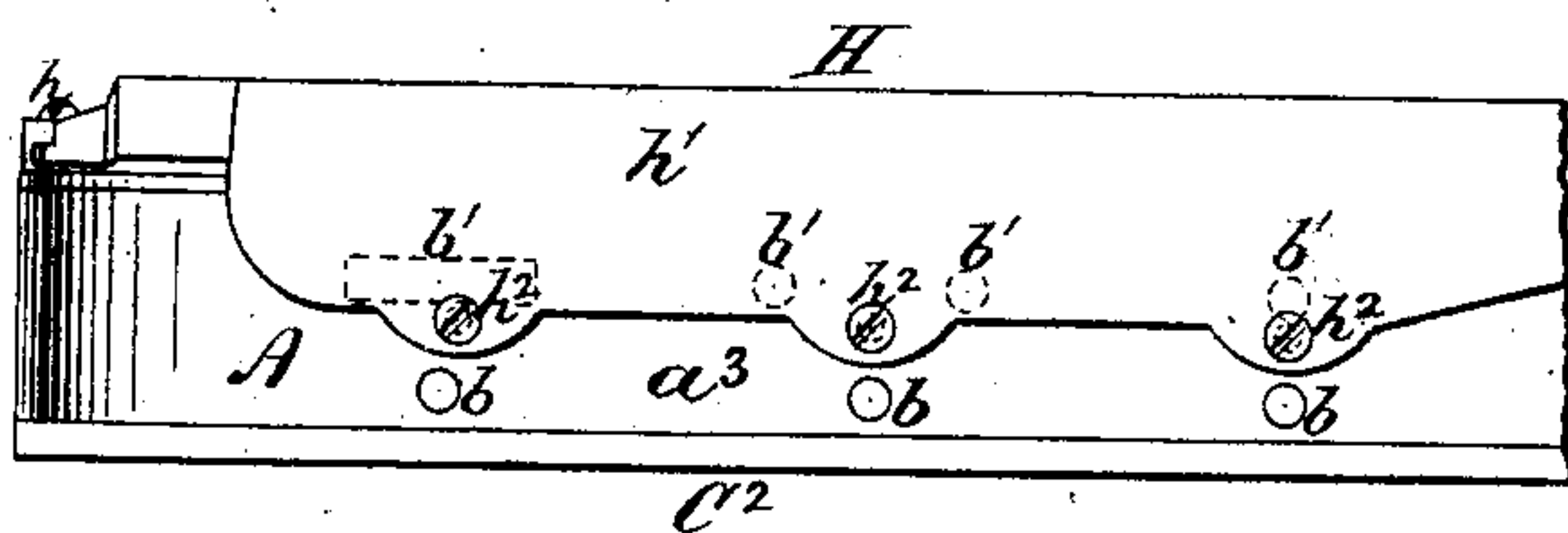


Figure 5.



Witnesses:
As a Fan.
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Inventor:
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UNITED STATES PATENT OFFICE.

C. F. THEODOR STEINWAY, OF NEW YORK, N. Y.

UPRIGHT PIANO-FORTE.

SPECIFICATION forming part of Letters Patent No. 230,354, dated July 20, 1880.

Application filed March 19, 1880. (No model.)

To all whom it may concern:

Be it known that I, C. F. THEODOR STEINWAY, of the city and State of New York, have invented certain Improvements in Upright Piano-Fortes, of which the following is a specification.

My improvements relate to the construction of the wooden frame, sounding-board, wrest-plank, and iron frame of an upright piano-forte, and to the mode of incorporating these several parts into the structure as a whole; and my invention embraces the following features: First, a bent rim formed of a single plank or of a strip built up of boards or veneers glued together, supported interiorly by three or more parallel wooden braces and by an angular wooden brace, and affording a continuous bearing for the sides and lower edge of the sounding-board; secondly, a sounding-board having a straight inclined upper edge bearing upon the lower part of an offset formed along the lower edge of the face of the wrest-plank and glued at its sides and lower edge to a continuous bent rim; thirdly, wooden dowels or tenons inserted transversely through the rim into the ends of the wooden braces, or forming a part thereof, or into the ends or forming a part of the wooden cheek-pieces glued to the sides of the braces, the dowels or tenons serving to secure the braces to the rim, and in some cases being made to project from the face of the rim, and to thus afford at their outer ends bearings for a deep flange cast upon the inner edge of the bottom of the iron frame; fourthly, an iron frame provided near the upper end of its inner face with a straight inclined shoulder for affording the bearing for the wrest-plank, and with a deep flange at the bottom cast upon its inner edge, and tapped to receive the screws by which the iron frame is at that point secured to the wooden frame, and provided upon its front upper part, nearly opposite the inclined shoulder which forms the bearing for the wrest-plank, with outwardly-projecting ribs, taking the place of the ordinary agraffes, and affording the upper bearings for the strings; and, finally, an angular offset of the web of the casting, the edge of which bears upon the outer portion of the inclined side of the rim, the sounding-board which extends to the outer edge of the other

parts of the rim being at that point cut away, and only partially covering the edge of the inclined side of the rim, and hence leaving space to afford the bearing for the offset portion of the web of the iron frame.

Although my improvements are chiefly designed for employment in upright piano-fortes, it will be obvious that several of them may also be usefully employed in square and grand piano-fortes.

In the accompanying drawings, representing my invention embodied in the frame of an upright piano-forte, Figure 1 is an elevation of the wooden frame or block with the sounding-board and the wrest-plank removed. Fig. 2 is a similar elevation with the wrest-plank and sounding-board in place. Fig. 3 is a front elevation, showing the iron frame affixed to the wooden frame. Fig. 4 is a vertical section through the line $x x$ on Fig. 3. Fig. 5 is a view of the bottom of the frame as it appears when the iron and wooden frames are secured together.

The wooden frame or block of the piano-forte is composed of the rim A, which is U-shaped, having one straight vertical leg, a , and one crooked leg, the upper portion of which, a' , is vertical, while the lower portion, a^2 , is inclined at an obtuse angle with the vertical portion a' and the bottom a^3 of the frame. Interiorly the frame is provided with three vertical braces, $B B' B^2$, and with an inclined brace, B^3 , extending from the upper end of the vertical brace B^2 to the upper part of the inclined portion a^2 of the rim. These braces are preferably composed of a central strip of maple, to the opposite sides of which are glued, respectively, two strips of pine or spruce.

The braces and the rim are glued to three parallel horizontal planks, one, C, at the top, one, C', at the middle, and one, C², at the bottom, of the frame.

The ends of the braces in contact with the rim are secured thereto by the dowels b and b' , extending transversely into or through suitable perforations in the rim. Instead of the dowels, the ends of the braces may be formed into pins or tenons for insertion through the perforations in the rim.

The cheek-pieces $c c$ may be glued, respectively, to the opposite sides of the brace, and

may either have their lower ends formed into pins or tenons for insertion through the perforations in the rim or may be bored to receive dowels.

5 The upper ends of the rim and of the braces are laterally stayed in position by the horizontal stretchers D , D' , D^2 , and D^3 , which are interposed, respectively, between the adjacent braces and between the outer braces and the
10 rim, and are bevel-jointed upon the braces.

The upper ends of the rim and braces and the upper surfaces of the stretchers and the upper edge of the horizontal plank C are planed to form a horizontal bearing, upon which the
15 upper portion of the case of the piano-forte is glued. The rim is somewhat wider than the braces, except near the top of the frame, where it is cut into a level with the front sides of the braces and the edges of the plank F .

20 The upper edge, f , of the wrest-plank is in the same plane with the upper surfaces of the horizontal stretchers, and forms a portion of the horizontal bearing upon which the upper part of the case is glued. The lower edge, f' ,
25 of the wrest-plank is inclined and its lower portion is reduced in thickness, so that when the wrest-plank is secured in position the outer face of the lower portion of the wrest-plank and the outer edge of the rim occupy the same
30 plane and afford a continuous bearing for the entire edge of the sounding-board G .

The upper edge of the sounding-board is glued to the wrest-plank, and its sides and lower edge are glued to the rim, the whole of
35 which is thus utilized for propagating vibrations from one part of the sounding-board to another.

The upper edge, g , of the sounding-board is inclined and only partially overlaps the thinner portion of the wrest-plank, leaving space
40 between the edge of the sounding-board and the thicker portion of the wrest-plank for the admission of the inclined flange cast upon the iron frame to afford a bearing for the wrest-
45 plank.

The sounding-board completely overlaps the edge of the rim, excepting upon the inclined part a^2 of the rim, where a sufficient space is left to permit a bearing of the iron frame.

50 The iron frame H is cast with suitable diagonal braces, and is secured at the top by the horizontal screws h , which are inserted in the wrest-plank. The side pieces, H' , of the frame are cast with the outwardly-projecting
55 flanges H^2 , which give them an L shape in cross-section and greatly stiffen the frame. At the bottom the iron frame is provided with a wide inwardly-projecting flange, h' , which bears against the ends of the projecting dowels or
60 tenons b' , and is perforated to admit the vertical screws h^2 , which are inserted into the rim at points immediately opposite the lower ends of the braces. A portion of the lower right-hand corner of the frame has an inward offset,
65 H^3 , which bears upon the outer portion of the edge of the inclined part a^2 of the rim, to which the iron frame is secured by the horizontal

screw h^3 . A straight inwardly-projecting flange or rib, H^4 , is cast upon the inner side of the iron frame in an inclined position corresponding with the position of the inclined shoulder
70 of the wrest-plank, for which the flange H^4 affords the bearing.

On the outer face of the iron frame, near the top and nearly opposite the wrest-plank flange
75 H^4 , are cast the outwardly-projecting ribs H^5 and H^6 , which respectively form the upper bearings for the upper and lower groups of strings. As these bearings perform the functions of the agraffes commonly used, I have
80 given them the name of "agraffe-bars."

The holes I are tapped in the iron frame for the reception of the horizontal bolts I' , by which the iron frame is secured directly to the
85 braces B and B^2 , and the sounding-board is provided with the usual perforations i to permit the passage of the bolts I' .

No portion of the iron frame is in contact with the sounding-board, the iron frame having its bearings upon the upper edge of the
90 wrest-plank and upon the edge of the inclined portion a^2 of the rim and upon the projecting dowels or tenons b' at the bottom of the frame.

By the employment of the bent rim with braces doweled or tenoned into it, and of a
95 wrest-plank glued to the rim and the braces, and of a sounding-board glued around the entire edge of the rim and also to the wrest-plank, the entire wooden structure is incorporated into a single vibrating system, and vibrations
100 of one part of it are propagated with great facility throughout all parts of it, and are not interfered with by any objectionable contact of the wooden frame with the iron frame.

Mechanically my improved frame combines
105 great simplicity of organization with superior strength and rigidity.

I have heretofore employed in grand pianofortes a bent rim, to a portion of which the sounding-board was glued; but in the present
110 case I have not only so organized the structure as to permit the employment of a bent rim in an upright piano-forte, but also to permit the entire rim from one end to the other to be secured to the sounding-board, and to acquire
115 such contact therewith as to transmit vibrations to and from all the fibers of the wood of which the sounding-board is composed.

I claim as my invention—

1. A wooden frame or block for an upright
120 piano-forte, having a rim bent into the shape of a U with one crooked leg, and having two or more parallel vertical braces and an angular brace extending from the upper part of the inclined portion of the rim to the upper end
125 of the adjacent vertical brace, and having stretching-pieces respectively interposed between the upper ends of the adjacent braces and between the upper ends of the rim and the braces adjoining the rim, the several parts being secured together, substantially as shown
130 and described.

2. In a wooden frame or block for a pianoforte, the combination of the bent rim A with

interior braces, B, B', B², and B³, secured to the rim by means of dowels *b b'*, or by means of tenons forming a part of the braces and inserted into or through suitable transverse perforations in the rim, substantially as shown and described.

3. A U-shaped bent rim for the wooden frame of a piano-forte, the upper portions of the legs of which are narrowed in width and form bearings, respectively, for the opposite ends of the wrest-plank, substantially as shown and described.

4. In a wooden frame for an upright piano-forte, substantially such as described, the combination of a bent rim with a wrest-plank, the outer face of the lower portion of which is in the same plane with the front edge of that part of the rim below the wrest-plank, for the purpose of affording a bearing for the upper edge of the sounding-board directly upon the wrest-plank, substantially as shown and described.

5. The combination, in an upright piano-forte, of a sounding-board with a bent rim, to the edge of which the sides and bottom of the sounding-board are continuously fastened, as and for the purpose set forth.

6. In an upright piano-forte, a sounding-board, glued at the top to the wrest-plank and

at the sides and bottom to the edge of the bent rim, substantially as shown and described. 30

7. The wooden cheek-pieces *c c*, glued to the sides of the lower portion of the braces and secured to the rim by means of dowels or tenons extending through transverse perforations in the rim, substantially as shown and described. 35

8. In combination with the bent rim and braces of the wooden frame, the horizontal stretchers D, D', D², and D³, bevel-jointed upon the braces, substantially as shown and described. 40

9. An iron frame for an upright piano-forte, provided at the bottom with a wide inwardly-projecting flange, in combination with projecting dowels or tenons inserted through the rim and into the braces, or forming part of the braces, and affording at their outer ends bearings for the flange of the iron frame, substantially as shown and described. 45

10. The offset portion H³ of the iron frame, in combination with the inclined part *a*² of the rim, substantially as shown and described. 50

C. F. THEODOR STEINWAY.

Witnesses:

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ROBERT H. POLLOCK.