

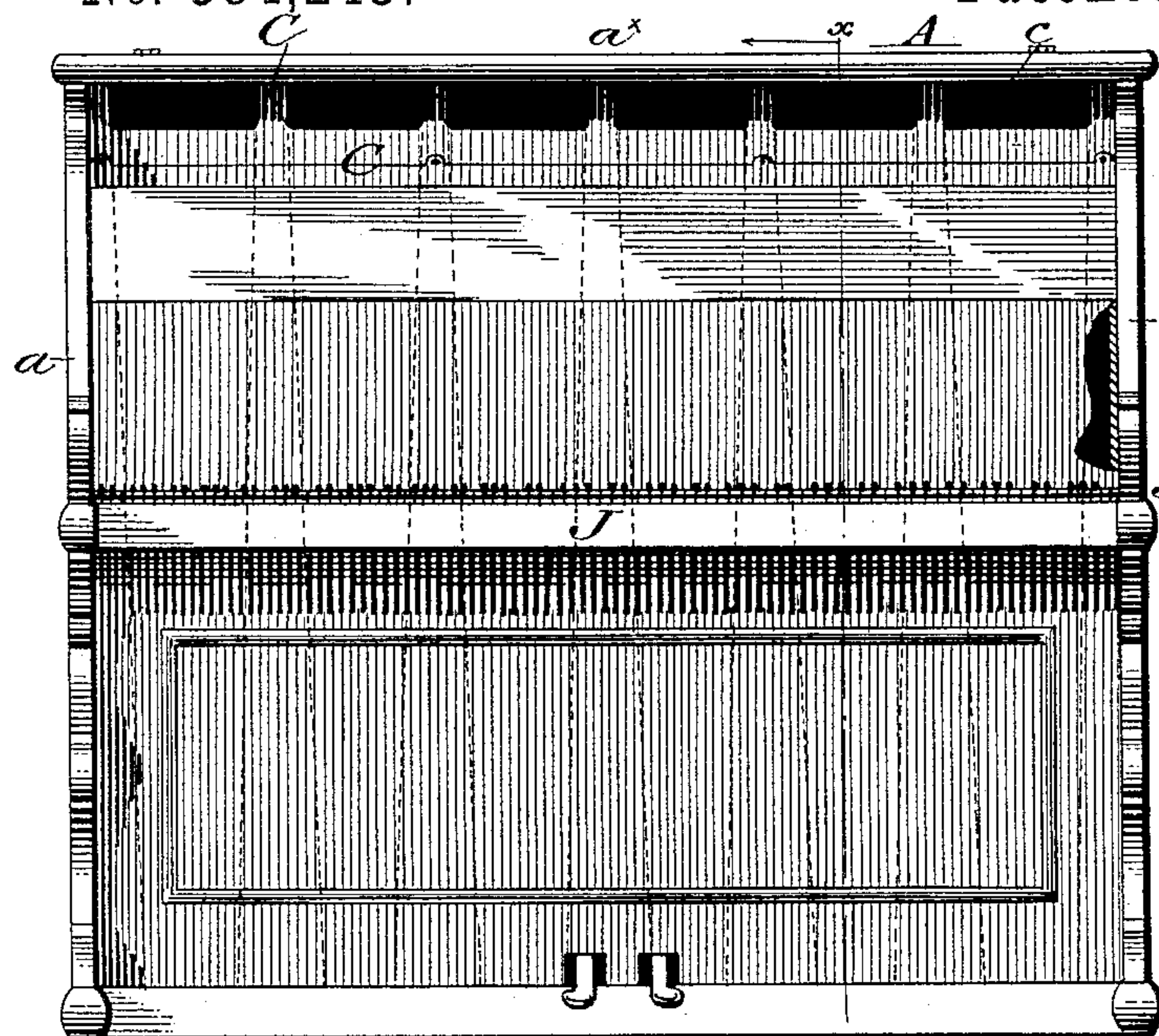
(No Model.)

W. H. DUTTON.

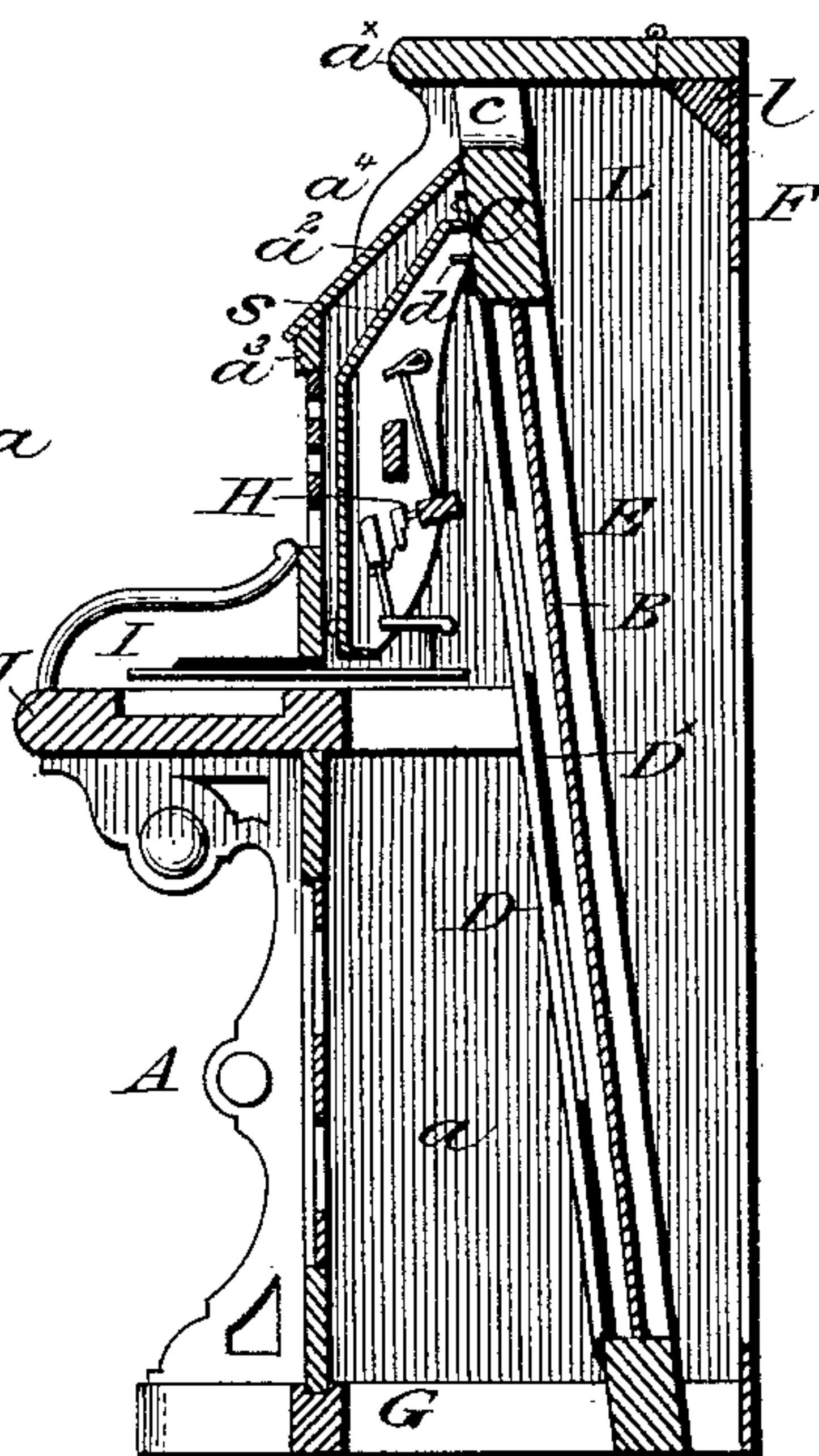
UPRIGHT PIANO.

No. 384,243.

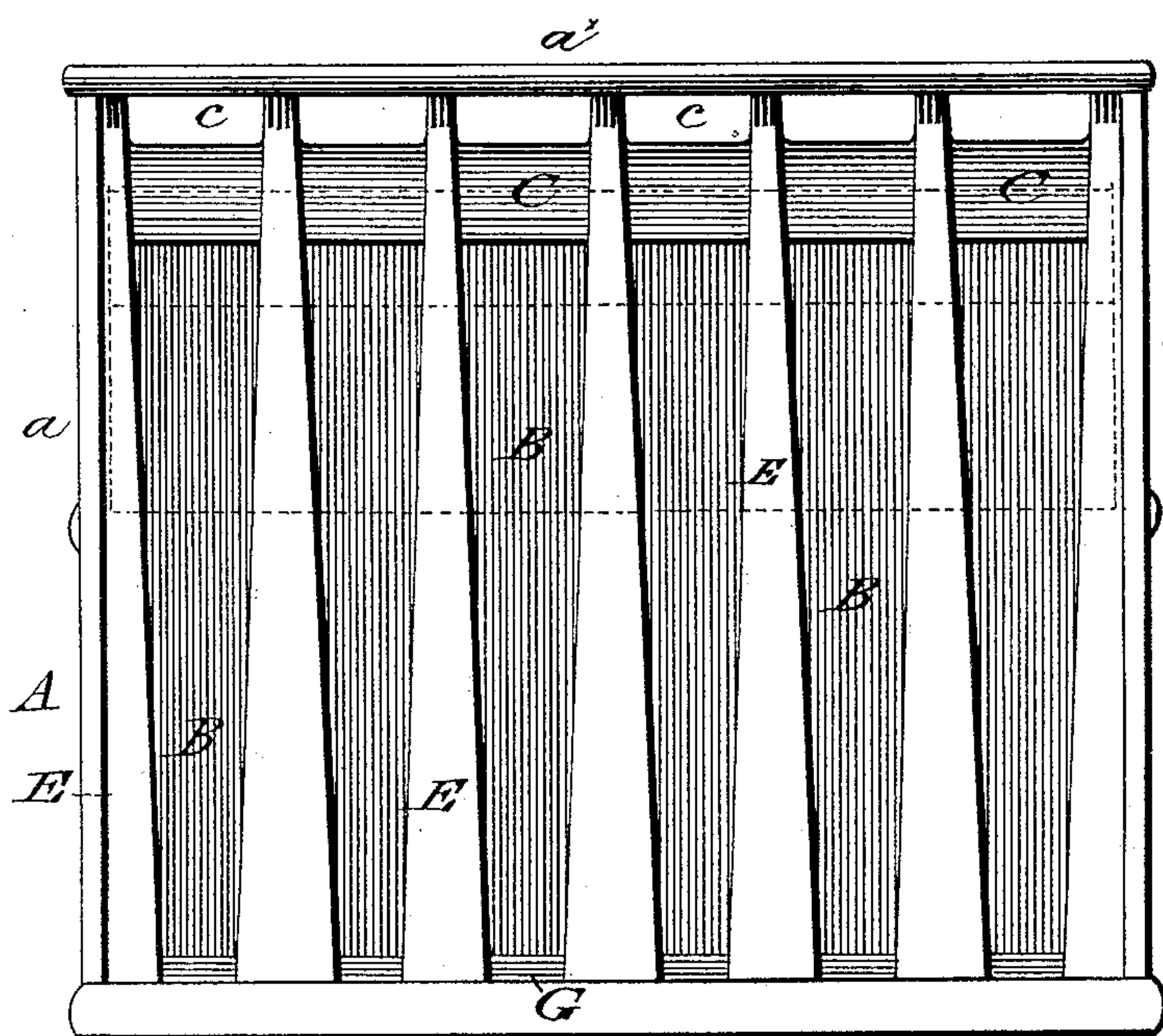
Patented June 12, 1888.



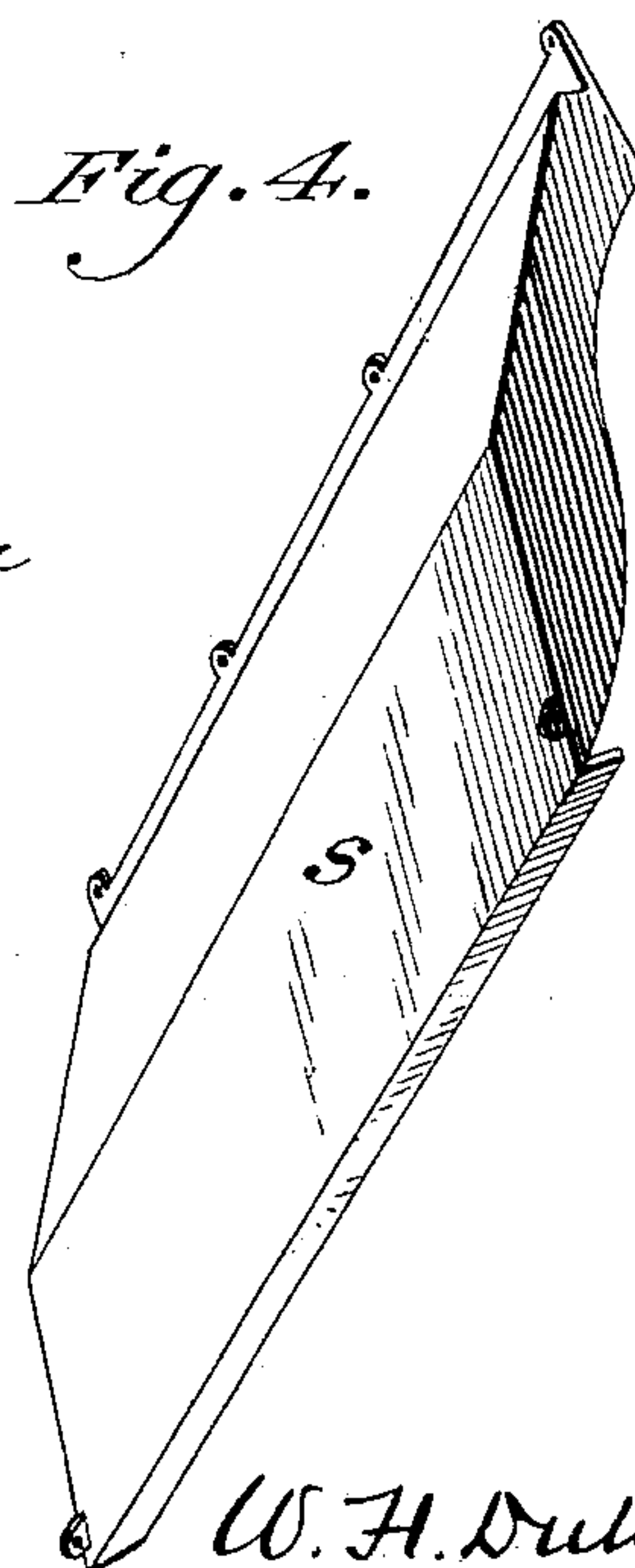
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



W. H. Dutton,

Inventor.

By his Attorneys

W. C. Strawbridge,

J. Bonnell Taylor,

Witnesses.

P. F. Bagle.

John Jolley Jr.



# UNITED STATES PATENT OFFICE.

WILLIAM H. DUTTON, OF PHILADELPHIA, PENNSYLVANIA.

## UPRIGHT PIANO.

SPECIFICATION forming part of Letters Patent No. 384,243, dated June 12, 1888.

Application filed July 1, 1887. Renewed February 20, 1888. Serial No. 264,625. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. DUTTON, a citizen of the United States, residing in the city and county of Philadelphia, and State of Pennsylvania have invented certain Improvements in Upright Pianos, of which the following is a specification.

My invention relates to that class of pianos which are technically known as "uprights," and in which the sounding board occupies a vertical or approximately vertical plane.

Until the date of a certain invention made by me, application for patent for which was filed October 9, 1886, the upper or head portion or head of the framework, of which head the pin block is a component member and the front face, was, in pianos of the foregoing class, constructed or framed as a solid or practically solid and rigid cross-head, cross-frame, or heading, incapable of vibration.

My invention above referred to embodies the construction of an upright piano in which provision was made for rendering the upper part or head of the framework of the instrument a skeleton or box-like musically-vibratory framing, and to such extent itself a musical instrument, and in which provision was also made for venting the tone existing to the rear of the sounding board within the casing directly upward through the skeleton head of the casing, and for, above the top level of said head, throwing the tone forward into the apartment within which the instrument happened to be placed.

The foregoing construction invented by me, was, briefly stated, effected by the omission of the filling blocks, which, in the solid heads of upright pianos as heretofore constructed, completely filled the spaces existing between the pin block the vertical studs and the back board;—by making the entire top or lid of the piano at once either the lid of the box-like structure formed in the head by the omission of said filling pieces, or a swell to the tone conductors;—and by the provision of a reverberator or deflecting device above the head of the casing, serving, either with or without the aforesaid lid, to deflect the tone emanating upward through the open spaces or tone conductors so as above formed between the studs the pin block and the back board, forward

into the apartment within which the piano was placed.

In the foregoing invention, so, as aforesaid, constituting the subject matter of my application for patent referred to,—and to which application, for detailed explanation, reference is to be made,—the pin block was retained in its integrity, and extended from its usual lower level upward to a level edge flush with the top of the casing.

My present invention, having the same general object as my former one, aims to secure the venting of the tone existing to the rear of the sounding board forward into the apartment by the provision of a top portion or head provided with channels or tone conductors having forwardly-facing mouths or openings formed through the front face of the instrument, and beneath a cover or lid which is preferably but not necessarily imperforate, and which is conveniently hinged to the rear of the head so as to be, if desired, adjustable to various inclinations,—such openings being in communication with open spaces or tone chambers existing to the rear of the sounding board, and being in effect lateral, forwardly-facing, and approximately right angular mouths to the tone conductors or spaces existing between the pin block the back board and the studs.

The foregoing objects I attain by a construction, a good form of a convenient embodiment of which is represented in the accompanying drawings and described in this specification, the particular subject matter claimed as novel being hereinafter definitely specified.

In the drawings, Figure 1 is a front elevation of an upright piano embodying my improvements, the sounding deflector and upper front panel being removed to expose the sounding dome, and the latter being partly broken at the right side to exhibit construction. Fig. 2 is a transverse sectional elevation of the said piano in the plane of the dotted line *xx* of Fig. 1. Fig. 3 is a rear elevational view of the instrument represented in Figs. 1 and 2, the back board, however, being shown removed. Fig. 4 is a view in perspective of a sounding dome which incloses the action in front and serves as a secondary sounding board to the instrument. This dome constitutes the subject matter of an application for patent ex-



cuted and filed by me contemporaneously with this application as Serial No. 230,579.

In the drawings, A is the casing which may be of any usual or preferred character; *a* are the sides thereof; B is the main sounding board, which occupies a plane slightly inclined from the vertical, is stepped or fastened at its base in any usual manner, and, as to its upper portion, is connected with the pin block C, which constitutes an integral portion and the front face of the head or top of the framework of the instrument.

D are the strings, D<sup>x</sup> the iron plate or frame for said strings, and *d* the tuning keys in the pin block with which said strings are connected.

E are the framing studs of the framework, spaced apart such a distance as is usual, framed at their upper portions between the pin block at the front and the back-board F at the back, and at their lower extremities stepped into the base block G, or otherwise supported and maintained as convenience of manufacture may dictate. Each framing stud is preferably made, as shown, to taper in two directions;— that is to say, viewed from the front, to be wider at its lower than at its upper extremity, and, viewed from the side, to be wider at its upper than at its lower extremity.

*a*<sup>x</sup> is a cover or lid to the head of the casing, which is preferably but not necessarily solid or imperforate, and which is likewise preferably but not necessarily hinged to the rear of the head so as to be, if desired, capable of elevation and adjustment to various inclinations forward of the perpendicular and preferably approximating the horizontal.

H is the key action, which may be of any preferred character; I are the keys; and J the key bottom upon which the keys are mounted.

Each framing stud is, as in my former invention, from its base block or basal support, throughout its extent, and to the top level of the head independent of and disconnected from every other stud, so that between said studs and the pin block and back board are formed continuous interspaces, ducts, or channels, which I term tone-conductors L, and which extend completely up to the under level of the cover or lid of the casing.

By virtue of the foregoing construction, as in my other invention, the entire upper portion or head of the framework is formed as a vibrating box or frame bounded by the pin block in front, the back board at the back, the outside studs at the sides, and the solid cover or lid at the top, in which box exist transverse divisions formed by the upper portions of the framing studs, between which divisions and the aforesaid bounding members the tone conductors exist and extend from the open spaces to the rear of the main sounding board upward as far as the cover of the instrument.

*c* are a series of forwardly facing mouths to the tone conductors which open into or communicate with said conductors in such manner that tone emanating upward from the spaces to the rear of the sounding board through said

conductors, can find vent forward through said mouths directly to the front, through the front face, so to speak, of the instrument, and into the apartment within which it is placed. These mouths can be formed as slots, cuts, perforations, recesses, or other openings, cut bodily through and out of the upper portion of the pin block, when placed in the usual manner,— or else can be formed, without actual cutting or notching out of the upper portion of the pin block, either by simply leveling off or dressing away to a sufficient depth the entire upper portion of said block, or else by lowering the pin block sufficiently to occasion the formation of these mouths between the upper level of the head and its thus, as aforesaid, lowered upper level.

Of the foregoing constructions the first is the best, because both of the last named modes of forming the aforesaid mouths necessarily either expose the upper extremities of the studs and render the appearance unsightly, or else necessitate the application of filling pieces to the front of said studs in order to preserve a slightly appearance.

*a*<sup>2</sup> is a sounding deflector extending from the under edges of the mouths of the tone conductors at a proper angle downwardly to the front or upper panel frame *a*<sup>3</sup> of the casing, and together with said panel frame constituting the upper portion of the outside front face of the casing. This sounding deflector is of thin wood, it being a sounding board and constituting the subject matter of an application for patent executed by me and filed, as Serial No. 230,581, upon the 12th day of March, 1887.

*a*<sup>4</sup>, Fig. 2, is a bracket, serving as a stiffening rib to the sounding deflector and introduced as shown in front of a stud and, therefore, between adjacent mouths of the tone conductors, and below the cover. As many of these brackets are employed as may be desired. They present an ornamental appearance and obviate the necessity of otherwise bracing the sounding deflector.

*l* is an internal deflector secured to the front of the angle of joinder of the back-board and cover, extending lengthwise of the instrument, and serving to turn or deflect the tone rising through the tone conductors out through their mouths. This deflector may be constructed either as a single piece as long as the framework, the studs being beveled to receive it; or else as a series of pieces introduced one in each tone conductor.

S is a sounding dome, composed of sounding board wood, and adapted to be removably secured along its upper edge to the pin block, and at its lower lateral portions to the sides of the casing. This sounding dome constitutes the subject matter of an application for patent executed by me and filed, as Serial No. 230,579, upon the 12th day of March, 1887.

The precise form of the tone conductors, as such, is of course immaterial, but it is preferable, for simplicity and economy of construction, that they should be substantially rect-



angular chambers or openings. It is not essential that the studs should taper, as shown, but it is a good construction causing the tone conductors to flare upwardly so as to form the largest possible areas or surfaces for vibration, and passages for the emission of tone.

Such being a description of a good form of instrument embodying my improvements, it will be readily understood that the gist of the improvements primarily resides in providing in connection with a skeleton or box-like musically-vibratory head or top for the framework of an upright piano, a series of forwardly facing or fronting mouths or openings beneath the cover of the casing and in communication with tone conductors through the skeleton head and with the spaces to the rear of the sounding board, such construction of the mouths being secured either by notching or cutting out the upper portion of the pin block, by dressing off said upper portion uniformly, or by lowering the pin block as an entirety;—and further resides in the employment in connection with the skeleton head so as aforesaid provided with tone conductors having forwardly facing mouths, of a sounding deflector extending obliquely forward and downward from below the aforesaid mouths, and serving to transmit and magnify the vibrations which it receives from the skeletonized pin block, and to reflect, deflect, and reverberate to the ears of the player and forward into the apartment, the aggregate tone of its own vibrations, the vibrations of the pin block, and the vibrations from the rear of the sounding board. I do not confine myself to any particular angle for this deflector, and it may lie in a horizontal or almost horizontal plane and still subserve a useful purpose.

I do not restrict myself to an invariable conjoint employment of the sounding deflector, and tone conductors having forwardly facing mouths, as it would, of course, be possible to employ them separately, but the best results are secured by a construction embodying both features.

I have herein spoken of the tone conductors as being "in communication" with the spaces to the rear of the sounding board: By this statement, however, I am not to be understood as meaning that the communication is necessarily a physical one, and that, for instance, a ball introduced through the mouth of a tone conductor would necessarily fall to the base of the instrument behind the sounding board,—because musical tone,—consisting of vibrations, and being increased and enhanced, rather than diminished or deteriorated by the interposition of a thin piece of wood,—would be emitted through the tone conductors and be deflected and given off through their mouths notwithstanding the interposition of transverse thin pieces of wood, in the form, for instance, of a bottom to the box-like structure which constitutes the skeleton head of the framework.

It is proper to remark that this invention is applicable in connection with a certain upright piano invented by me, the front panels of the casing of which contain adjustable reverberating slats, the upper panel lying below the sounding deflector herein referred to,—application for patent for which invention was executed by me and filed, as Serial No. 230,581, upon the 12th day of March, 1887.

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

1. An upright piano the top portion or head of the frame-work of which is provided with channels or tone conductors having forwardly facing mouths, substantially as and for the purposes set forth.

2. An upright piano the upper portion or head of the frame-work of which is provided with channels or tone conductors having forwardly facing mouths, and which is provided with a sounding deflector, substantially as and for the purposes set forth.

3. An upright piano the upper portion or head of the frame-work of which is a skeleton or box-like structure, the component members of which are so joined or framed together as to embody between them openings or tone conductors, and the pin block of which is, as to its upper level, lowered, dressed off, or notched out, to afford forwardly facing mouths to said tone conductors, substantially as set forth.

4. In an upright piano of the character hereinbefore set forth, in combination with the tone conductors having forwardly-facing mouths, the internal deflector, substantially as and for the purposes set forth.

5. An improved frame-work for an upright piano, consisting of a pin block, a back-board, and a series of vertical framing studs each tapering in two directions, and disposed between said pin block and back board at given intervals in such manner as to constitute the head of the framing a skeleton or vibratory framing, and to form in it a series of vertical passages or tone conductors, substantially as set forth.

6. As an article of manufacture, a piano pin block having a series of notches or openings cut through its upper portion, substantially as and for the purposes set forth.

7. In an upright piano, the following elements in combination:—a framework having a skeleton head provided with tone conductors having forwardly facing mouths, a cover superimposed upon the head, an internal deflector within the tone conductors beneath said cover, and a sounding deflector, substantially as and for the purposes set forth.

In testimony whereof I have hereunto signed my name this 29th day of June, A. D. 1887.

W. H. DUTTON.

In presence of—

J. BONSALE TAYLOR,  
WM. C. STRAWBRIDGE.