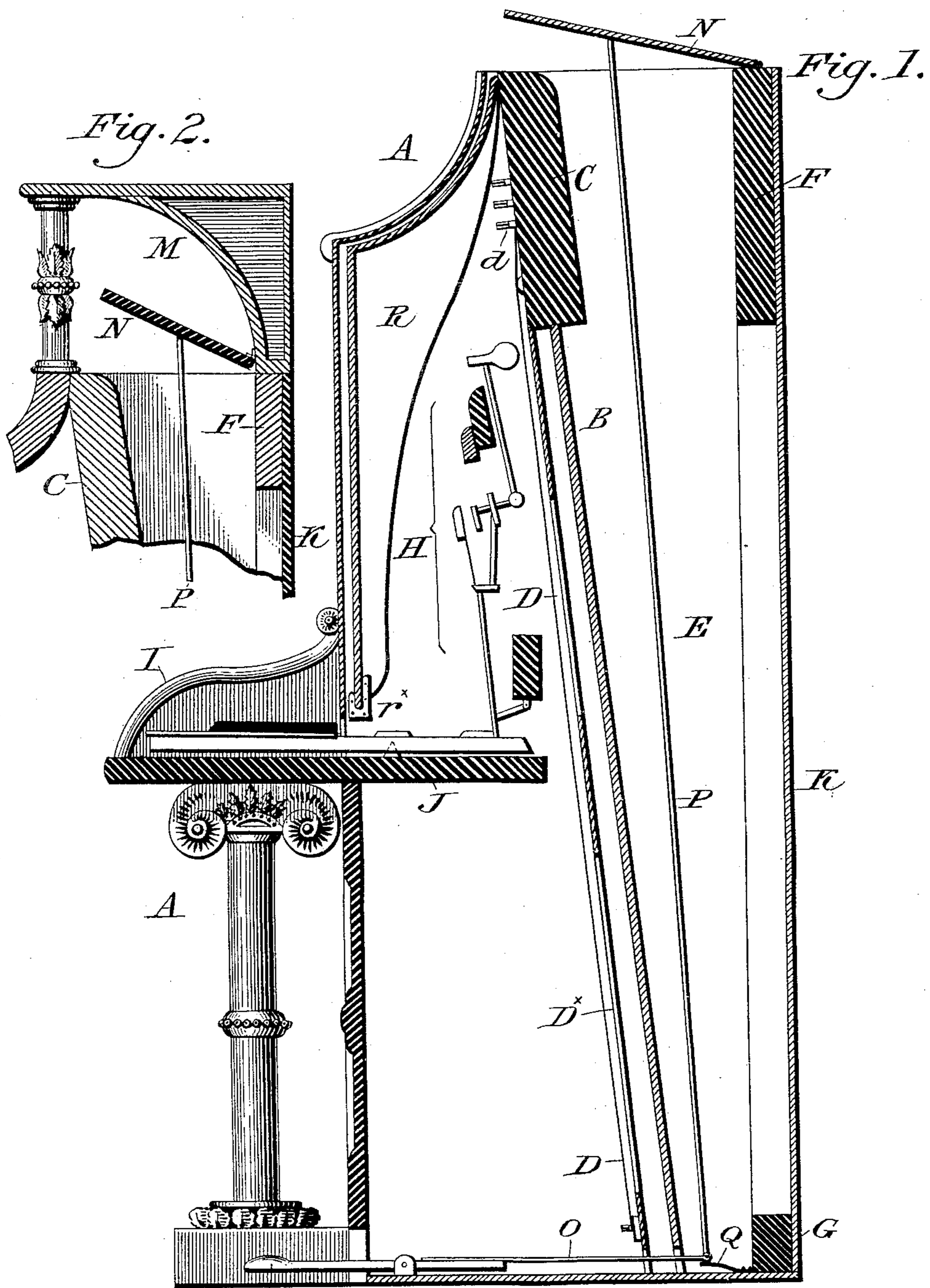


W. H. DUTTON.

UPRIGHT PIANO.

No. 384,241.

Patented June 12, 1888.



WITNESSES:

*P. F. Bagley*  
*John Polley*

INVENTOR.

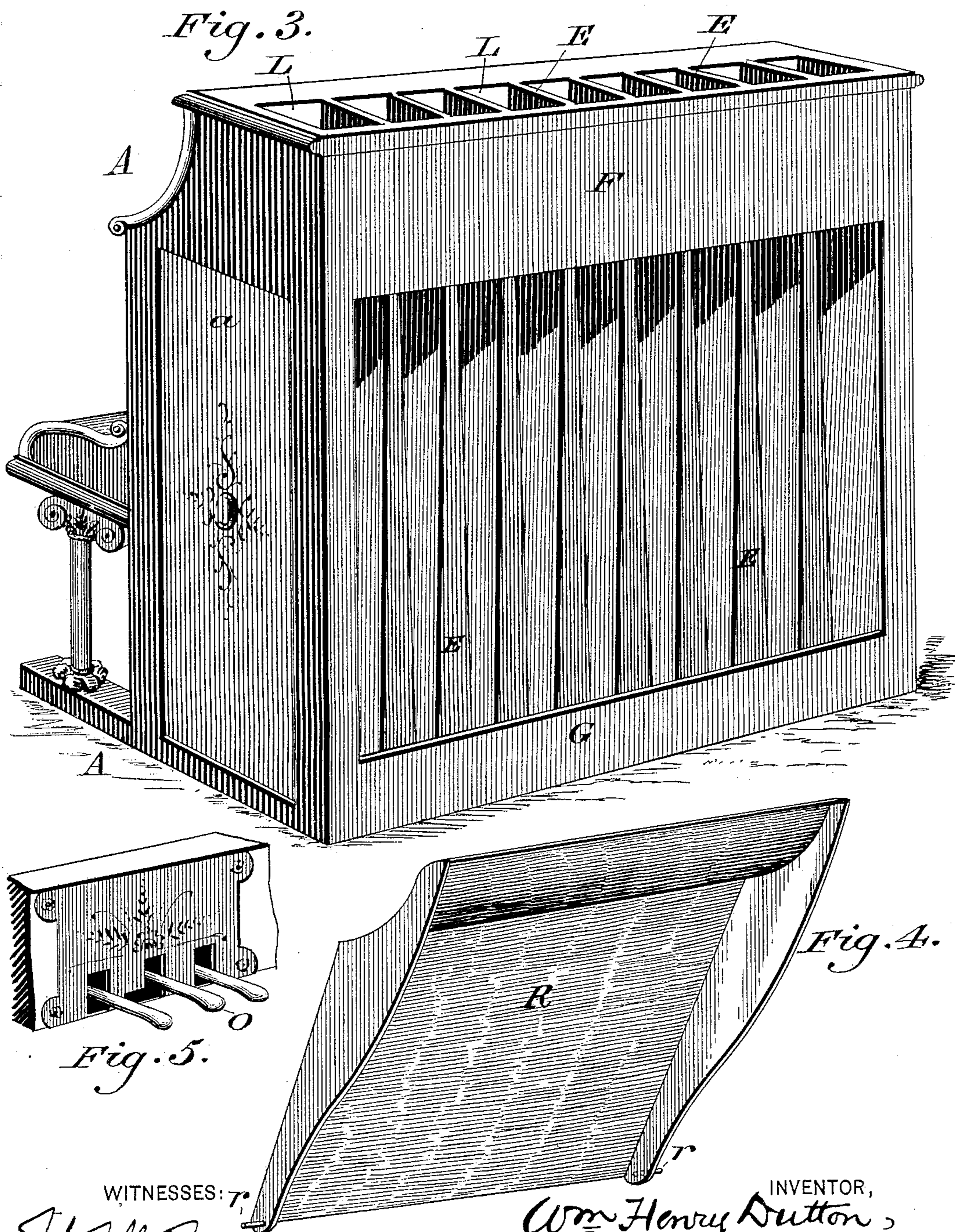
*Wm Henry Dutton*  
*By his Attorneys,*  
*Wm C. Strawbridge*  
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# UNITED STATES PATENT OFFICE.

WILLIAM H. DUTTON, OF PHILADELPHIA, PENNSYLVANIA.

## UPRIGHT PIANO.

SPECIFICATION forming part of Letters Patent No. 384,241, dated June 12, 1888.

Application filed October 9, 1886. Serial No. 215,785. (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, in the 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.

Heretofore in pianos of the foregoing class the upper or head portion or head of the framework, of which head the pin block is a member and constitutes the front face, has been constructed or framed as a solid, or practically solid, and rigid cross head or cross frame incapable of vibration.

The object of my invention, broadly stated, is the construction of an upright piano, in which provision is made for rendering the upper part or head of the framework of the instrument a skeleton, or box-like, musically-vibratory framing,—which to such extent is itself a musical instrument,—and in which provision is 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 it forward into the apartment within which the instrument is placed.

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 transverse, side, sectional, elevation through an upright piano embodying my improvements. Fig. 2 is a side elevation of a reverberator or tone deflector which is mounted upon the skeleton top platform or head of the framework. Fig. 3 is a perspective view of the back of such a piano as is represented in Fig. 1, with the casing back removed to exhibit the studs and sounding board. Fig. 4 is also a perspective view of a sound deadening or muffling dome or action-noise chest which incloses the action above and in front. Fig. 5 is a similar view of a supplemental pedal which I find it con-

venient to employ in connection with the ordinary pedals of the instrument, as a means for controlling a valve or lid for covering the mouths or upper openings of the tone conductors.

Similar letters of reference indicate corresponding parts.

In the drawings, A is the casing, which may be of any usual or preferred character; *a* are the sides thereof.

B is the 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 is an integral portion of 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 for said strings; and *d* tuning keys in the pin block with which said strings are connected.

E are the usual vertical framing studs of the framework, spaced apart such distance as is usual, framed at their upper portions between the pin block C at the front and a transverse back board F at the back, and at their lower portions framed to a base block G, or otherwise supported and maintained as convenience of manufacture may dictate.

H is the key action, which may be of any preferred character.

I are the keys; and J the key bottom upon which said keys are mounted.

K is the back to the casing which serves to inclose or bound the interspaces and open spaces existing between the sounding board and the framing studs.

Each framing stud is from the base block or basal support throughout its extent to the top level of the back board and pin block independent of and disconnected from every other framing stud, so that between said studs and the pin block and the back board are formed continuous interspaces, channels, passage ways, or openings, which I term "tone conductors" and which extend completely through the framed box-like structure which constitutes the upper portion or head of the framework of the instrument.

By virtue of the foregoing construction the entire upper section of the piano framework is formed into a horizontal, skeleton, vibrating frame, which is bounded by the pin block

in front, the back-board or rear wall at the back, the outside framing studs at the sides or ends, and in which exist transverse divisions formed by the upper portions of the framing studs, between which divisions and the afore-  
 5 said bounding members of said vibrating frame the tone conductors exist and extend from the rear of the sounding board entirely through the upper portion, top platform, or head of  
 10 the framework of the instrument.

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 rectangular  
 15 chambers or openings substantially of the character represented. It is preferable also that the back to the casing should be employed; but it is not essential, especially where it is intended to place the instrument against a wall.

20 The upper portion or head of the framework is surmounted by a longitudinally extending reverberator or tone deflector M, which may be of any preferred construction, but the office of which is to turn, deflect, or reverberate the  
 25 tone which rises through the tone conductors above the top of the casing forward to the front of the instrument and into the apartment within which it is placed. To this end therefore the said reverberator is well made as to  
 30 its deflecting surface of circular or parabolic cross-section, it extending longitudinally across and from the extreme back edges of the openings or mouths of the tone conductors upward and forward more or less directly over said  
 35 several openings or mouths.

In connection with the skeleton head of the framework its contained tone conductors and the reverberator, I likewise prefer to employ  
 40 a lid N for the tone conductors, which is hinged along the back edge of the top platform or head of the piano to the rear of the back sides of the openings or mouths of the tone conductors, and which may be either flat or curved after the manner of a reverberator itself, but  
 45 which, when dropped, is of such dimensions as to effectually and tightly inclose the top openings or mouths of all of the tone conductors and complete the box-like structure of the skeleton top or head to the casing. The said  
 50 lid, when not used as a top to the box of the head subserves the purpose of a swell to the tone conductors and renders the tone emitted and reverberated, loud or soft, as it is opened, closed, or controllably adjusted at will.

55 The foregoing lid may be operated by a draw stop, by a lever, or by any desired contrivance; I, however, prefer to operate it by the aid of a supplemental pedal O, which is conveniently disposed between the loud and soft pedals of  
 60 the action, and which is connected by a pedal rod P, contained within one of the tone conductors, with the lid direct.

Q is a spring of any desired character placed beneath the inner end of a supplemental pedal  
 65 to counterbalance the weight of the lid. The supplemental pedal is conveniently provided

with a side stop or slot and has a slide action into said stop or slot, as shown in Fig. 5.

R is a muffling dome or action-noise tone chest, which is adapted to cover and inclose  
 70 the top and front of the hammer action of the instrument from the finger keys to a point above the tuning keys, and which extends across the entire length of said hammer action. This dome is formed of any sound deadening ma-  
 75 terial, or is covered, lined, or felted, with, cloth, or leather, to render it impervious to sound, and it therefore serves to contain within the instrument to the front of the sounding board, and to muffle against escape, the sounds arising from the friction and movement of the ac-  
 80 tion, and the tones which dust or the noise of the action render imperfect. This dome, which is concealed by the front paneling of the casing is removable, conveniently by being pro-  
 85 vided with gudgeons or lateral pins  $r$ , which are adapted to sockets  $r^x$  attached to the casing, a button  $r^2$  of any preferred snap, catch, or other means of connection being employed to retain the dome against the pin block.  
 90 When the button is turned free, the dome can be rotated upon its gudgeons to the front of the casing and readily removed.

Such being a description of a good form of instrument embodying my improvement, it  
 95 will be readily understood that the gist of that improvement primarily resides in making the head or top of the framework of the instrument instead of a solid mass of material, a skeleton, a framed-together, or a box-like  
 100 structure, capable of vibration, and therefore itself a musical instrument,—such result being most readily secured by the removal or omission of the filling pieces between the studs, and being accompanied by the concomitant result  
 105 that the openings so produced by the removal of the aforesaid filling pieces, constitute ducts, or channels, which pass up through the top of the instrument, and, being in communication  
 110 below with the interspaces and open spaces existing to the rear of the sounding board between the studs and sides of the casing, serve as tone conductors to vent the tone existing  
 115 within the casing to the rear of the sounding board out through the top of the instrument and against the reverberator or deflector superimposed above said ducts and acting to deflect the tone forward or to the front of the instrument and into the apartment within which  
 120 it is placed.

It will be apparent that the pin block itself is preserved intact, and that it and the back board when framed in with the studs form a frame-work of entirely sufficient strength.  
 125 The dome or action tone chest may, if desired, be omitted, although, when employed, it serves to insure against the escape of the tone except through the tone conductors. Considered simply as a hollow or skeleton framed box, the skeleton head which I employ, even with the  
 130 lid kept closed, gives better musical results than have heretofore been possible with up-

right instruments as ordinarily made. I prefer to employ the lid in connection with the reverberator or tone deflector, but the lid can be dispensed with; as can also the reverberator when the lid is kept closed.

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 dropped into 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 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 frame-work.

I am aware that holes or openings have been formed through the solidly framed heads of upright pianos in order to permit of the ascent of sound, and to such a construction I lay no claim.

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

1. An upright piano the upper portion, or head of the framework of which is of skeleton or box-like structure, in order to render said upper portion of said framework a musically vibratory framing, substantially as set forth.

2. An upright piano, the upper portion or head of the framework 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 which both render said head a musically vibratory framing and afford top channels of egress for the tone which exists to the rear of the sounding board within the casing of the instrument, substantially as set forth.

3. An upright piano, the upper portion or head of the framework 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 which both render said head a musically vibratory framing and afford top channels of egress for the tone which exists to the rear of the sounding board within the casing of the instrument, and which is provided with a controllable lid which serves as a swell to said tone conductors, substantially as set forth.

4. An upright piano, the upper portion or head of the framework of which is channeled or provided with openings or tone conductors which render said head a musically vibratory

framing, and afford top channels of egress for the tone which exists to the rear of the sounding board within the casing of the instrument,—and which is as to its said head provided with a reverberator, or other suitable tone-deflecting device, which serves to deflect the tone escaping from the openings or tone conductors forward or to the front of the instrument, substantially as and for the purposes set forth.

5. An upright piano, the upper portion or head of the framework of which is channeled or provided with openings or tone conductors which render said head a musically vibratory framing, and afford top channels of egress for the tone which exists to the rear of the sounding board within the casing of the instrument,—which is as to its said head or casing provided with a reverberator, or other suitable tone deflecting device, which serves to deflect the tone escaping from the openings or tone conductors forward or to the front of the instrument,—and which is also provided with a controllable lid which serves as a swell to said tone conductors, substantially as set forth.

6. In combination with the casing and with the action of an upright piano, a sound-deadening or muffling dome or action-noise chest composed of material through which sound will not pass, applied in front of and inclosing the action, substantially as and for the purpose set forth.

7. An upright piano, the upper portion or head of the framework of which is channeled or provided with openings or tone conductors which render said head a musically vibratory framing, and afford channels of egress for the tone which exists to the rear of the sounding board within the casing of the instrument,—and which is also provided with a muffling dome or action-noise chest for incasing the key action and deadening its sound, substantially as set forth.

8. An improved framework for an upright piano consisting of a pin block, a back-board, and a series of vertical framing studs disposed between said pin block and back-board at given intervals and without intermediate filling blocks in such manner as to constitute the head of the framework a skeleton or vibratory framing, and to form in it a series of vertical passages or tone conductors, substantially as set forth.

In witness whereof I have hereunto signed my name this 28th day of September, A. D. 1886.

W. H. DUTTON.

In presence of—

J. BONSALE TAYLOR,  
WM. C. STRAWERIDGE.