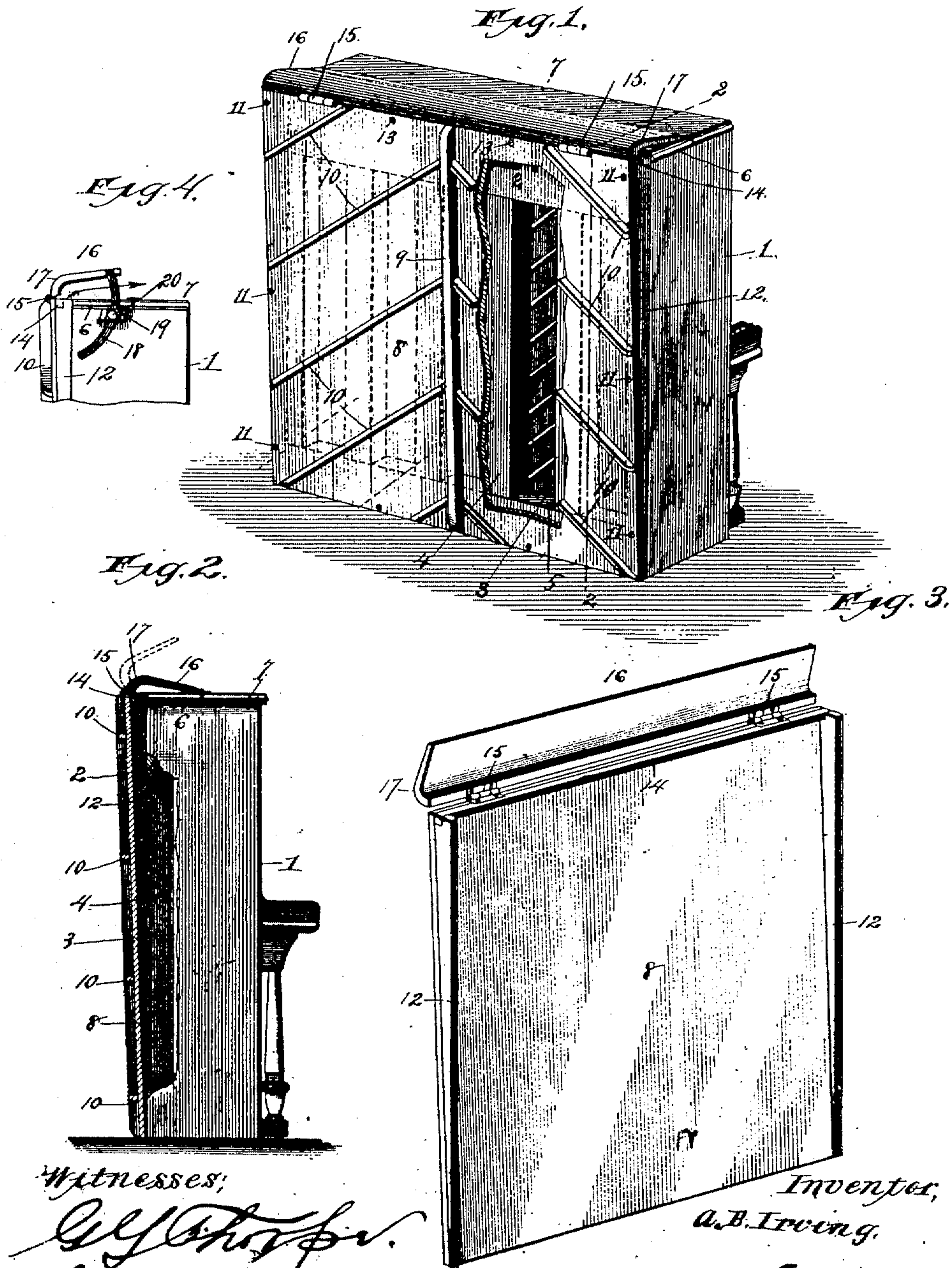


(No Model.)

A. B. IRVING.
UPRIGHT PIANO FORTE.

No. 461,833.

Patented Oct. 27, 1891.



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UPRIGHT PIANO-FORTE.

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To all whom it may concern:

Be it known that I, ALEXANDER B. IRVING, of Colorado Springs, El Paso county, Colorado, have invented certain new and useful Improvements in Upright Piano-Fortes, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to upright piano-fortes; and the object of my invention is to produce an attachment for this class of musical instruments which shall operate to prevent the dissipation of the sound-waves through the open back of the pianos, and which shall also conduct such waves upward and deflect them toward the front of the instrument, whereby the full power and tone quality of the instrument shall be thoroughly developed and transmitted to the performer or other persons occupying positions at the front of the piano-forte.

To the above purposes my invention consists in certain peculiar and novel features of construction and arrangement, as hereinafter described and claimed.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a perspective view of an upright piano-forte with my improved sound collector and deflector applied thereto, the view being toward the back of the piano-casing and the attachment being shown as partly broken away to expose certain interior parts. Fig. 2 is a transverse vertical section of the same on the line 2 2 of Fig. 1. Fig. 3 is a detached perspective view of my improved sound collector and deflector. Fig. 4 is a detached view, in side elevation, of the upper part of the attachment, showing a connection for retaining the deflector in its several positions of adjustment.

Previous to this invention it has been the usual custom to leave the backs of the casings of upright piano-fortes open, so that the sounding-board shall be exposed to view and with the purpose of permitting the full power of the instrument to be developed unrestrained by any muffling, which it has been assumed would result from closing the back of the casing. The result has been that a

large percentage of the sounds produced by the instrument have been dissipated through the back of the instrument and have been lost to a considerable extent to the performer or listener occupying a position at the front of the instrument. This fact will be instantly evident to any one who will first place himself at the front of an upright piano of the usual construction and listen to a chord struck by the performer, and then change his position to the back of the instrument and listen to a repetition of the chord. The volume of sound received from the back of the instrument is at least fifty per cent. greater than that received from the front of the same, and certain desirable qualities of the tone—such as the “cello” or “singing” tone of the instrument—are not fully developed. As will be seen from the ensuing description, my improved attachment collects the tones which have heretofore been dissipated through the back of the instrument, solidifies such tones, develops their full harmonic qualities, and finally deflects them powerfully from the back of the instrument and out over the front of the same.

Referring now to the parts by numerals of reference, 1 designates the casing of an upright piano-forte. It is to be understood that this piano-forte may be of any of the various types of upright piano-fortes, its action or operative parts being immaterial to the effective application of my invention, and therefore not being shown. 2 designates the pin-block, and 3 the sounding-board, of the instrument. As usually constructed the pin-block 2, which is located in the upper part of the rear of the casing, is retained in such position by any desired number of vertical supports 4, the lower ends of which rest upon the back part of the base of the frame of the instrument, and upon the upper ends of which rest the said pin-block. The top of the casing 1 is partially closed by a top board 5, to the front edge of which is hinged a lid 7, by opening or closing which it has been endeavored to appreciably increase or diminish the volume of sound emitted by the instrument.

8 designates the body portion of my improved attachment for this class of instruments, said body portion being preferably of suitably-seasoned wood, but permissibly of

metal or of any other material which is capable of receiving and transmitting in the manner hereinafter described the variations produced by the musical tones emitted by the instrument. This body portion is of such form and dimensions as to completely cover and close the back of the casing 1, and the said body portion is strengthened by a central vertical rib 9, which is formed upon or secured to the outer surface of the body portion, and also by any number of oblique ribs 10, similarly formed upon or secured to said outer surface. Upon the inner or front surface of this body portion 8, at the vertical margins of the same, are secured by screws 11 or any other suitable or preferred means two side pieces 12. These side pieces are preferably of similar material to that of the body portion 8, and said side pieces diminish in width from their upper ends to their lower ends, as shown, and for a purpose to be presently explained. To the inner surface of the body portion 8, at the upper margin thereof, is secured by screws 13 or by any other suitable or preferred means a top piece or strip 14, which extends entirely across the body portion 8 from side to side thereof, and the ends of which are preferably mortised into the upper ends of the side pieces 12, the said top pieces being preferably, although not necessarily, of a material similar to that of which the body portion 8 is composed. To the upper edge or margin of this body portion 8 is secured by suitable hinges 15, or by any other connections which will permit its required movements, a deflector 16, which is also of wood, metal, or any other suitable or preferred material, and which corresponds in length with the width of the body portion 8. This deflector 16 is of any desired width; but if, as shown, its width is about one-half of the entire width of the top of the piano-casing the deflector will be found to operate satisfactorily. As shown, the outer or rear portion 17 of this deflector is curved downwardly, and this has been found to be a desirable form for said deflector; but it is to be understood that this precise form of deflector may be varied at pleasure without departing from the essential spirit of my invention.

The operation of this attachment is as follows: Before the musician commences his performance upon the instrument he raises the deflector 17 preferably to the position shown in dotted lines in Fig. 2—that is to say, so that the main or body portion of the deflector shall incline upwardly and forwardly, the precise amount of such elevation of the deflector being regulated to suit the musician's judgment. In order to support the deflector in more or less raised position, the attaching hinges 15, which connect the deflector to the upper edge of the casing, may be made sufficiently stiff to retain the deflector without other aid. I have, however, shown in Fig. 4 an arrangement for accomplishing this purpose, which arrangement

may or may not be employed, as preferred. In this arrangement a single arm 18, preferably of metal, of ornamental appearance, is attached at its upper end to one end of the deflector 16, so as to extend downwardly and rearwardly therefrom concentrically with the hinges 15. This arm works through a bracket 19, which is also preferably of metal and of ornamental appearance, and which is secured to the upper part of the corresponding side of the casing 1. A set-screw 20 works through this bracket, and the inner end of said set-screw impinges upon the outer side of the arm 18. The arrangement is such that when the musician raises the deflector to the desired height he turns the set-screw so that it binds upon the arm 18, and thus retains the deflector in the required position. It is to be understood that I contemplate various other means for controlling the action of the deflector 16, and have illustrated and described this particular arrangement as being one embodiment of this idea. The musician also, if he so desires, raises the lid 7 of the top of the instrument; but this is entirely immaterial to the effective action of my improved attachment. Now as the strings are vibrated and the sounds are emitted by the instrument the sounding-board 3 is first caused to vibrate in unison with the sound waves or vibrations produced by the strings. The body portion 8 of the attachment also vibrates in unison with the vibrations of the sounding-board 3, and the column of air inclosed between the sounding-board 3 and the body portion 8 is correspondingly vibrated. In accordance with the natural law of movement of sound waves or vibrations the waves rise instantly and in great volume out through the opening between the upper margin of the body portion 8 of the attachment, and being caught by the deflector 16 are directed forwardly and are caused to flow with great force, volume, and harmony directly over the top of the instrument and toward its front side. The effective power of the instrument is thus very greatly augmented and the cello or singing tone of the instrument, which has never heretofore been fully developed, is produced with remarkable distinctness, the harmonies of the notes being also fully developed, and the tones emitted by the instrument being pure as well as powerful.

The upward and rearward inclination of the body portion 8 of the attachment, due to the described tapering form of the side pieces 12, is materially advantageous, inasmuch as it assists the natural upward flow of the sound-waves in the space between the sounding-board 3 and the body portion 8.

The phenomena of action of this attachment may be rendered clear by stating that in the previous forms of upright piano-fortes having open backs the usual sounding-board acted as defectively as would a drum having but a single membrane or head, while the body portion 8 of this attachment acts, in conjunc-

tion with the usual sounding-board 3, similarly as does the second head of a drum, the sound-waves being concentrated between the two parts and a sound of great power thus emitted. These two parts—the sounding-board and the body portion—act as a single hollow sounding-board.

The attachment is simple and comparatively inexpensive in construction, and, as before stated, can be readily applied to all present types of upright pianos, or it can be made a permanent part of pianos during their original construction.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent, is—

1. An improved attachment for upright piano-fortes, comprising a body portion of vibratory material, side pieces attached to the front surface of said body portion and diminishing in width from their upper to their lower ends, and a movable deflector attached to the upper part of said body portion, substantially as set forth.
2. An improved upright piano-forte provided at its rear side with a body portion of vibratory material corresponding in form and dimensions with the back of the casing and inclined upwardly and outwardly upon said back portion of the casing, and also forming a space between itself and the usual sounding-board, and a movable deflector attached to the upper part of the body portion, substantially as set forth.

3. An improved upright piano-forte provided at its rear with a body portion of vibratory material forming a space between itself and the usual sounding-board, a deflector movably attached to the upper part of said body portion, and a movable support connected to the deflector and serving to retain the same in any desired position of adjustment, substantially as set forth.

4. An improved attachment for upright piano-fortes, comprising a continuous closed body portion of vibratory material, side pieces attached to the front surface of said body portion and diminishing in width from their upper to their lower ends, and a movable deflector attached to the upper part of said body portion.

5. An improved upright piano-forte provided at its rear side with a continuous closed body portion of vibratory material and corresponding in form and dimensions with the back of the casing and inclined upwardly and outwardly upon said back portion of the casing, and also forming a space between itself and the usual sounding-board, and a movable deflector attached to the upper part of the said body portion, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ALEXANDER B. IRVING.

Witnesses:

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