



# UNITED STATES PATENT OFFICE

2,134,680

PIANO

Dunbar Beck, Hadlyme, Conn., assignor, by mesne assignments, to Steinway & Sons, New York, N. Y., a corporation of New York

Application January 13, 1938, Serial No. 184,875

4 Claims. (Cl. 84—189)

This invention relates to pianos, and more particularly has for its object to provide a means for the better dissemination of the sounds of a grand piano than such heretofore employed, but the invention is equally applicable to upright pianos and semi-grands or semi-uprights.

In the use of grand pianos, it has been found that the resonance and tone distributing qualities are better when the cover of the grand piano is opened. On the other hand, it has been found that when such cover is opened, the direction of sound produced by the strings when the keys have been actuated is more or less unidirectional, in that the sound rays are deflected laterally of the length of the grand piano. In consequence, when people sit at the front of the piano, as for instance the player and those immediately attendant the player, they do not obtain the full benefit of the sounds, resonance and overtones of the piano.

The object of this invention is to provide means for deflecting sounds produced during the playing of the piano towards the front thereof, and for this purpose the invention consists of the deflecting member disposed between the frame of the piano and the cover of the piano, whereby the direction of the sounds may be deflected from their more or less normal direction laterally of the piano at the front thereof.

A further object is to enable such a deflecting member to be increased or decreased in size, depending upon the volume of the sounds to be projected forwardly, whereby if the deflecting member extends substantially the length of the cover, the cover and the deflecting member form, in effect, a sound box, the walls of which act to deflect the rays of sound from the rear to the front of the piano.

For this purpose, my invention consists of the improved means for deflecting the sound rays of a piano which can be readily placed out of action when the cover of the piano is closed, and can as readily be placed into action on the opening of the cover of the piano.

The invention consists of further other features and combinations of parts which will be more fully described hereinafter and embodiments thereof shown in the drawing and pointed out in the claims.

In the accompanying drawing:

Figure 1 is a perspective view of a grand piano having embodied therein a sound deflecting member for the purpose of directing the sound rays to the forward part of the piano;

Figure 2 is a plan view of Figure 1, with the

cover and music rack board removed therefrom, taken also on line 2—2 and seen in the direction of the arrows 2—2;

Figure 3 is a vertical transverse section taken on line 3—3 and seen in the direction of the arrows 3—3 of Figure 2;

Figure 4 is a plan view of a modified form of embodiment of the invention; and

Figure 5 is a plan view of another modified form showing the deflecting member extending to the rear of the piano case, such deflecting member being telescopically adjustable.

Similar characters of reference indicate corresponding parts throughout the various views.

Referring to the drawing, and more particularly to Figure 1, the grand piano 10 has the usual supporting legs 11, keyboard 12, music rack board 13, and cover 14 hinged at 15 to the piano case 16.

As is well-known, when it is desired to increase the sound of a grand piano, the front part 14a of the cover which normally encloses the music board 13 when the same is in its turned down position, is swung over and around the hinges 14b to the top of the cover 14, as shown in Figure 1, and the cover 14 is then raised into the position shown in Figure 1, and supported by a prop known and not shown in the drawing:

As is known also, the frame of the piano has bridges for holding strings which are generally shown in Figure 2, and generally indicated by 17.

It has been found that as the sounds are produced by the strings of a piano and enlarged by the sounding board of a piano, the sounds thus produced are projected laterally of the length of the piano frame, so that the greater body of sound and its harmonious interplay is projected from a grand piano in a direction about the middle of the case 16 between the front and back legs. Consequently, a person playing at the keyboard does not receive the full benefit of the tonal effect, and also should any audience be in proximity to the player, it will likewise receive only a partial benefit of the tonal effects produced by the player. This is of importance both in the use of a grand piano in the smaller living rooms of residences and apartments, and also for concert audiences, since it is the general custom to so place a concert grand piano that the player is visible to the extent of enabling the audience to watch the hands of the player. The diagonal position of the grand piano in respect to the transverse line formed by the front of the stage to the auditorium thus causes the beneficial effects of the piano to be

deflected laterally of the body of the audience, instead of to the audience itself.

The deflection of the sounds by the walls of the auditorium enables the people constituting the audience to receive such effects by deflection from such walls, but in this deflection certain tonal effects are lost, since they are absorbed to a certain extent by the walls and by the intervening obstructions. When it is realized that one of the beauties of piano playing is that which results from the overtones, it becomes a problem to present to the audience the full effect of the sounds produced as directly as possible. For the purpose of directing the individual sounds of the piano or their composite relationship with other sounds as directly as possible to the audience, under the conditions of use as before described of such grand pianos, the invention comprises the provision of a deflecting member arranged upon the piano case and capturing, so to say, the sounds as they are produced, and deflecting them to the forward part of the piano.

In the embodiment shown, the member 25, which is preferably made of suitable wood such as used in the making of soundboards or the like, is hinged at 20 to the frame 18 of the piano. This deflecting member 25 has its lateral walls 26 and 27 parallel with each other, but has its lowermost wall 28 at an incline to its uppermost wall 30. For the purpose of holding the deflecting member 25 in proper position, the under part of the cover 14 is provided with a fastening member 32 secured to the inner surface of the cover, which fastening member in the embodiment shown consists of a block 33 having a longitudinal groove 34, as shown in Figure 3.

It will be seen from Figure 2 that a sound produced in the proximity of the small circle 35 travels in the direction of the ray line 36 and strikes member 25 and is deflected in the direction of the ray line 37 to the front part of the piano, and as shown, directly over the keyboard. Another sound originating at the circle 38 travels in the direction of the ray line 39 and is deflected by the deflecting member 25 in the direction of the ray line 40 to the front of the keyboard of the piano. Of course, these examples 35 and 38 are simply isolated examples of many sounds that are produced, and in Figure 2 the deflecting member 25 is positioned in such a respect in regards to the front and rear of the piano that the deflecting member 25 receives the greatest portions of sound allowance and in consequence deflects them to the front of the piano.

In the embodiment shown in Figures 1 and 2, as also 3, the deflecting member 25 has a length or width about the size as shown in relation to the length of the piano, but it is clear that it can be increased or sharpened, depending upon the size of the piano and the character of the grand piano whether it is a residential grand piano or a concert grand piano.

Should it be desired to capture as many of the sounds produced as possible within the scope of the size of the piano case, in such a case an adjustable extension member 45 is provided which is telescopically movable within the deflecting member 25, so as to be extended therefrom either a longer or shorter distance, and, if desired, to the rear of the piano case 16, whereby the deflecting member 25 with its extension member 45 and the top of the piano 14 act in the nature of a sound box deflecting substantially all of the sounds of the piano to the front of the piano.

In Figure 5, sound origin circles 46, 47 and 48

are shown with the deflected rays therefrom indicated by 49, 50 and 51, all going in the direction of the front part of the piano.

In the foregoing, I have shown the preferred form of my embodiments, but a modified form thereof which does not operate to the same degree of efficiency is shown in Figure 4 where the deflecting member 25a has the hinges 20a, whereby the member 25a is hinged to the frame 18 of the piano, and the deflecting member 25a is held in position in respect to the cover 14 by the fastening member 32.

In this embodiment, the deflecting member 25a has its lowermost wall 28a substantially parallel with the longitudinal center line of the piano frame in contrast to the angular arrangement of the deflecting member 25 in the other figures.

From Figures 1, 2, and 3 it is seen that the lowermost wall 28 is placed at an angle to the longitudinal center line of the piano case, and this is also true of the embodiment shown in Figure 5 where the extension member 45 is movable in the same direction as the angular position of the member 25.

While, in general, the member 25a as shown in Figure 4 acts to deflect and cross-deflect certain sound rays, as a result of which certain of them are directed to the front of the piano, the angular position shown in Figures 1, 2 and 3 as also in Figure 5, has the advantage of endeavoring to catch as many sound rays as would go to the rear, and project them forwardly.

It will therefore be seen that a deflecting member 25 cooperating with the sound producing portions of a piano has been shown, which deflecting member cooperates also with the inner surface of the top of a grand piano for the purpose of deflecting the sounds towards the front of the piano.

The invention described can be applied to upright pianos or to those of semi-upright or of the semi-grand type so that as large a form of the sound produced and the beneficial tone of the effects thereof may be directed toward the front of the keyboard portion of the piano.

Various modifications of my invention have been described, but it is clear that changes may be made therein without departing from the spirit of my invention as defined in the appended claims.

What is claimed is:

1. In a piano having a frame, a case for the same, and a keyboard, the frame, case and keyboard forming the body of the piano, and a cover for the body, the combination with said body and cover, of a deflecting member supported on said body and having its lower edge angularly disposed to the longitudinal center line of the frame, and when the cover is open in inclined position having its opposite side edge in contact with and in adjustable position with and angularly disposed in respect to the inner inclined surface of the cover of the piano, for deflecting the sounds produced to the keyboard portion of the piano.

2. In a piano having a frame, a case for the same, and a keyboard, the frame, case and keyboard forming the body of the piano, and a cover for the body, the combination with said body and cover, of a deflecting member supported on said body and having its lower edge angularly disposed to the longitudinal center line of the frame, and when the cover is open in inclined position having its opposite side edge in contact with and in adjustable position with

5 and angularly disposed in respect to the inner inclined surface of the cover of the piano, for deflecting the sounds produced to the keyboard portion of the piano, the front and rear of said member having parallel sides and the top and bottom sides being converging, and said member extending from the rear of the piano case to the front part thereof.

10 3. In a piano having a frame, a case for the same, and a keyboard, the frame, case and keyboard forming the body of the piano, and a cover for the body, the combination with said body and cover, of a deflecting member supported on said body and having its lower edge angularly disposed to the longitudinal center line of the frame, and when the cover is open in inclined position having its opposite side edge in contact with and in adjustable position with and angularly disposed in respect to the inner inclined surface of the cover of the piano, for  
15  
20 deflecting the sounds produced to the keyboard

portion of the piano, and a second member telescopically adjustable in respect to the first member.

4. The combination of a piano including a body portion consisting of a frame, a casing therefor, and a keyboard, a cover for said body portion, said cover being hinged to the body portion to open and close the body portion, with a deflecting member supported on the body portion and adapted to be placed in inoperative position upon the frame and within the casing and cover when the cover of the piano is closed, and adapted to be placed in operative position to support the cover in an open, inclined position, said deflecting member having converging sides, the edges of which close the passage between the member and piano body and between the member and cover to form with the cover a sound box for deflecting the sounds produced by the piano to the keyboard portion of the piano.  
5  
10  
15  
20

DUNBAR BECK.