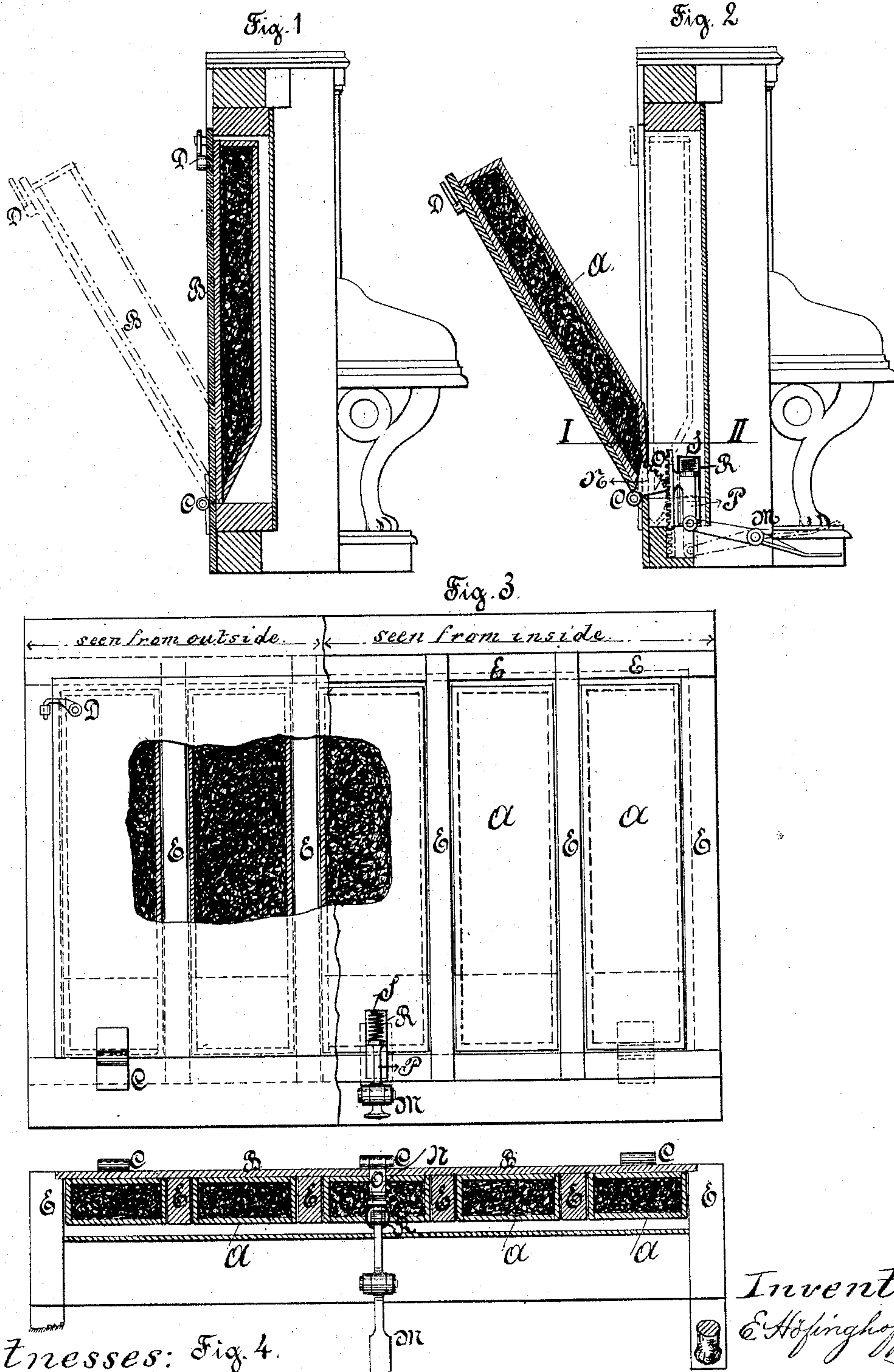


(No Model.)

E. HÖFINGHOFF.  
PIANO FORTE.

No. 353,453.

Patented Nov. 30, 1886.



Witnesses: Fig. 4.  
Theo. G. Hostet.  
C. Sedgwick

Inventor:  
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By Munn & Co.  
attys.



# UNITED STATES PATENT OFFICE.

EMIL HÖFINGHOFF, OF BARMEN, PRUSSIA, GERMANY.

## PIANO-FORTE.

SPECIFICATION forming part of Letters Patent No. 353,453, dated November 30, 1886.

Application filed January 30, 1886. Serial No. 190,306. (No model.) Patented in Germany June 5, 1885, No. 33,779, and in England June 5, 1885, No. 6,850.

*To all whom it may concern:*

Be it known that I, EMIL HÖFINGHOFF, merchant, of the town of Barmen, Rhenish Prussia, German Empire, have invented a new and useful Improvement in Piano-Fortes, (for which I have obtained patents in Germany, bearing date June 5, 1885, No. 33,779, and in Great Britain, bearing date June 5, 1885, No. 6,850,) of which the following is a full, clear, and exact description.

My invention relates to improvements in the tone or sound and to the conservation of piano-fortes, and is intended to give the following results: First, by my improvements the power of tone or sound of a piano-forte (grand piano) can be diminished to a minimum at the will of the player; second, the tone will be improved in quality; third, the piano, and especially the sounding-board, will be guarded against the ruinous influences of temperature and dampness, and consequently an instrument provided with my improvement will have a sound of good quality much longer than without my improvement. These objects are obtained by the arrangement illustrated in the accompanying drawings, in which—

Figure 1 is a vertical view of the piano, showing that part relating to my invention in section, and arranged for opening the sound-damper by hand. Fig. 2 is a vertical view of a piano, showing that part relating to my invention in vertical section, but arranged for opening and closing by a pedal and a counter-balancing device. Fig. 3 is a back view of a piano with my sound-damper, seen partially from the outside and partially from the inner side and partially in section. Fig. 4 is a horizontal section of Fig. 2 through line I II.

My invention consists in a damper-cover, B, which is fastened to the back of the piano, or to the bottom of the grand piano. This cover is hinged to the instrument by the hinges C, so that it can be opened or closed conveniently. As shown by Figs. 1 and 3, (left side,) the cover is held tight by the cramps or hooks D, and it must be opened or closed by hand. It can be fixed to any desirable amount of opening by any convenient device.

The arrangement shown in Figs. 2 and 3 (right side) represents my damper-cover in connection with a pedal, M, to which it is

joined by a rack, O, and part of a toothed pinion, N. By this means the damper-cover can be opened or closed at pleasure by the player, while playing, simply by pressing with his foot more or less on the pedal. In order to make this as easy as possible, and also to counter-balance the weight of the cover in every position, of which, as will be understood, the downward pressure will be the greater the more the angle of opening increases, the rack N is attached to a rod, P, with a sort of a piston-head, which enters into a tube or case, R, in which is inclosed a spiral spring, S, against which the piston-top of the aforementioned rod P presses. It follows from this device that the more the damper-cover is opened the greater will be the counter-pressure of the spring on the top of the rod P, and so both can be held perfectly in equilibrium in any position, and hardly any strain will be required to be exerted by the player with his foot on the pedal to open the damper-cover to any degree, and if the spring S is made a little stronger than the counteraction of the gravity of the open cover the latter will always close automatically.

Of course the same result—i. e., balancing the damper-cover in any position—might be obtained by other mechanical arrangements—such as, for instance, a cord running round a little pulley and a counter-weight attached to the free end of the cord, or, better, by a cord running round a grooved pulley having a volute shape, and such like mechanisms.

The cover B is provided at the inner side—that is, the side facing the sounding-board—with wood boxes or dampers A, which take nearly up the spaces between the frame E of the instrument at the back side of the piano, or at the bottom of a grand piano, when the cover is closed, or nearly so. These boxes are filled out with cotton-waste or other suitable material which is a bad conductor of sound, or has the quality of damping the sound.

The device used until now in closing the backs of piano-fortes by a light frame containing a panel of wire-gauze or another light woven stuff has the great disadvantage that dampness and other influences of temperature are in no way hindered from having a destructive effect to the sounding-board, and so



gradually ruining its resounding quality or its vibratory power. The inner mechanism also—the strings, &c.—suffers by dampness entering the instrument by the open back. This  
5 is obviated by the damper-cover described, which locks up the sounding-board almost airtight, and an instrument can be kept in use much longer than before.

I am aware that a sounding-board on which  
10 a piano was placed has been provided with a pedal-operated damper-board having a fabric-covered face.

I am also aware that the rear part of a piano-cover has been hinged, so that it can also be  
15 raised to operate somewhat after the manner of a swell-shutter; and I do not claim the same as of my invention.

I claim as my invention—

1. The combination, with a piano-forte, of  
20 a hinged cover for the space behind or under the sound-board, the said cover having a filling of fibrous or analogous sound-deadening material, substantially as set forth.

2. The combination, with a piano-forte, of

a cover hinged to open or close the space be- 25  
hind or below the sound-board, a damper-box projecting into the sound-box from the inner face of the cover, and a fibrous or analogous sound-deadening filling in the said damper-box, substantially as set forth. 30

3. The combination, with a piano-forte having the frame E, of the cover B, having the spaced damper-boxes A on its inner face entering the sound-chamber, and having a fibrous filling, the toothed segment N, connected with 35  
the cover, the rack O, meshing with the segment, the rod P, connected to the rack, the spring S, acting against the rod, and the lever or treadle M, pivoted to the frame and to the rod P, substantially as set forth. 40

The foregoing specification of my improvement in piano-fortes signed by me this 16th day of December, 1885.

EMIL HÖFINGHOFF.

Witnesses:

GEO. KOCH,  
CARL UFER.