

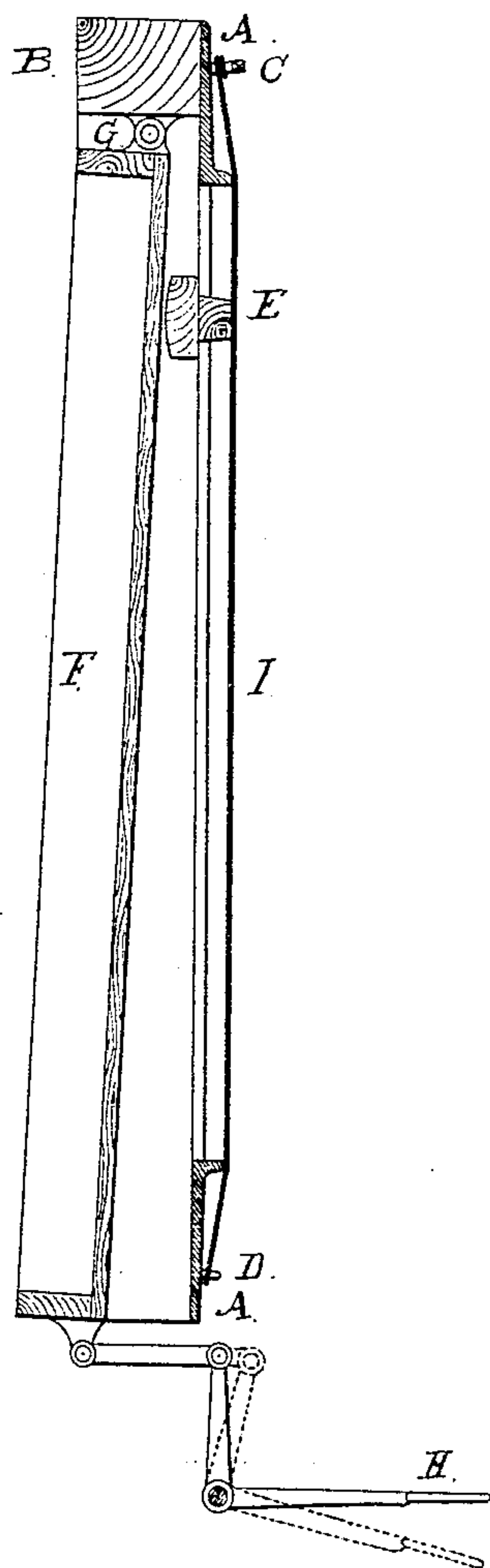
(No Model.)

R. HOWSON.  
Piano Forte.

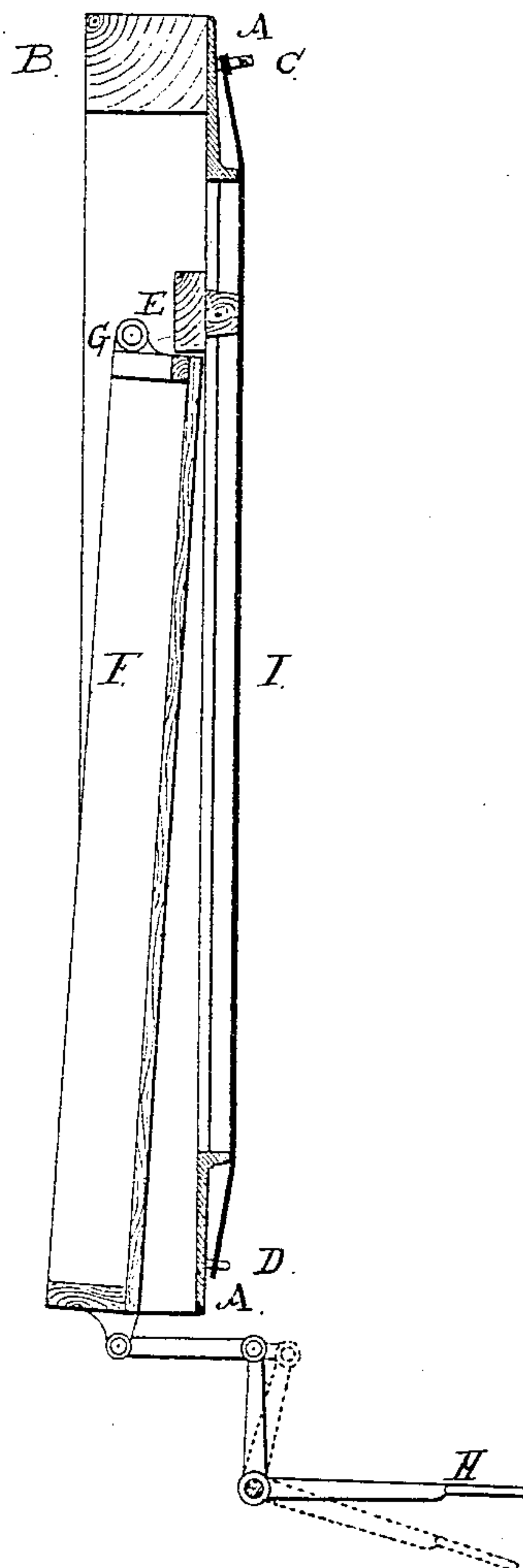
No. 232,970.

Patented Oct. 5, 1880.

*Fig 1*



*Fig 2*



*Witnesses:*  
*Harry Smith*  
*Robert H. How.*

*Inventor:*  
*Richard Howson*  
*by his Attorneys*  
*Howson and Son*

# UNITED STATES PATENT OFFICE.

RICHARD HOWSON, OF MIDDLESBROUGH-ON-TEES, GREAT BRITAIN.

## PIANO-FORTE.

SPECIFICATION forming part of Letters Patent No. 232,970, dated October 5, 1880.

Application filed July 15, 1880. (No model.) Patented in England January 13, 1880.

*To all whom it may concern:*

Be it known that I, RICHARD HOWSON, of Middlesbrough-on-Tees, in the county of York, Kingdom of Great Britain and Ireland, have  
5 invented new and useful Improvements in Piano-Fortes, (for which I have obtained a patent in Great Britain, No. 143, bearing date January 13, 1880,) of which the following is a specification.

10 My invention has reference to a mode of construction in piano-fortes whereby a "crescendo" and "diminuendo" effect may be produced at will by the performer.

The mode of construction is as follows: Instead of placing the sound-bridge on the sound-board in the usual manner, I place it on a separate narrow rail, which I shall hereinafter call the "vibration-rail," the whole being of such  
15 small dimensions in cross-section that, although it is able to vibrate freely, it is not capable of emitting very loud sounds. The sound-board proper is disconnected from the vibration-rail, but capable of being pressed against it by mechanical means. Thus when the sound-  
20 board is gradually forced into contact with the vibration-rail the tremulous motion of the latter when a note or chord is struck is transmitted to the former, and the volume of sound is augmented so as to produce a crescendo effect.  
25 On the other hand, when the two are gradually released from each other a diminuendo effect is the result.

It will be readily understood that pressure of the foot on a pedal, or of the hands on the  
35 key-board, will furnish the means of actuating the sound-board in its motions.

It will also be evident that by the above means all those other musical effects which depend upon the change from soft to loud and  
40 from loud to soft may be produced, and that the ordinary soft pedal may be dispensed with if thought proper.

In order to make the nature of my invention more clear, I proceed to describe its applica-  
45 tion to an upright or cabinet instrument. In this case the vibration-rail is most conveniently placed immediately below the wrest-plank.

Referring to the annexed drawings, I have shown two arrangements, both being alike in  
50 general construction, and differing only in the

position of the point of contact between the sound-board and the vibration-rail.

The same letters refer to the same parts respectively, and both Figures, 1 and 2, exhibit cross-sections of those parts only which refer  
55 to my invention, all unnecessary parts being removed for the sake of clearness.

A is the cast-iron frame, over which the strings I are stretched; B, the wrest-plank; C, the wrest-pins, and D the hitch-pins. 60

The vibration-rail, which extends across the instrument at right angles, or nearly so, to the strings, is shown at E. Immediately adjacent to this, but separate from it, is the sound-board proper, F, which is shown suspended from  
65 hinges G, one of which only is seen.

H is the pedal, so connected with the lower part of the sound-board that when the foot is pressed upon it the sound-board is pulled toward the performer, and the upper part of it  
70 comes in contact with the vibration-rail, and the sound is re-enforced. When the foot is released from the pedal the sound-board falls out of contact and the sound dies away.

The two figures (Figs. 1 and 2) are both  
75 shown with the sound-board in the free position, and they differ only in this respect, that in the first place the contact takes place at the back of the bridge with the belly of the sound-board, and in the other case at the un-  
80 der side of the bridge with the end of the sound-board. So far one method of obtaining contact is simply a modification of the other; but it will be evident that the essential feature of my  
85 invention is consistent with many other modifications which will readily suggest themselves to a competent mechanic. Moreover, the general arrangement, as well as details of mechanism, will of necessity vary in accordance with  
90 the class of instrument (whether upright, square, or horizontal grand) to which my invention is to be applied.

With regard to the nature and extent of the contact between the sound-board and the vibration-rail I would remark, first, that if it  
95 only takes place at a single point the re-enforcement of sound is very considerable. Nevertheless there may be many points of contact, in some cases with advantage, or the two may touch over their entire length; secondly, that 100



although I have described touching or pressing contact only, (which is effectual so long as it is firm,) still this does not preclude me from using pulling, binding, grasping, or interlocking contact, such as will suggest themselves to any mechanician.

In order, also, to soften the crescendo effect and prevent its coming on too suddenly, any elastic substance may be introduced between the touching surfaces, or other means may be adopted to effect the same purpose.

The dimensions of the vibration-rail will depend upon the amount of contrast desired between the soft tones and the loud ones. I have found a very good effect is obtained when the cross-section is diminished to the lowest dimensions consistent with the requisite strength, so that the whole then assumes the form of a simple bridge. I have found also that it is better to make the cross-section more substantial at the treble end than at the base end.

The vibration-rail, as stated above, extends from side to side of the instrument, and is of necessity a fixture. It may therefore be attached to the two sides of the cast-iron frame at both ends, or to one side only and at one end, (provided it is the treble end,) or it may be fixed to the cross part of the frame which carries the wrest-plank. I confine myself to no particular mode of attachment.

In reference to the action of the pedal as described, it is obvious that this may be reversed—that is to say, the pressure of the foot may release the contact instead of making it. Moreover, the pressure of the hands on the key-board may be substituted for the

pressure of the foot on the pedal, as will be readily understood by those who are conversant with instruments of this class.

It will thus be seen that many of the details which are involved in the carrying out of my invention may be varied according to the option of the maker, while they will of necessity vary in accordance with the different forms which piano-fortes assume. Nevertheless such variation does not in any way interfere with the essential feature of my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A piano-forte having the sound-bridge on a narrow rail independent of the sound-board proper and adapted to vibrate freely, substantially as described.

2. In a piano-forte, the combination, with a sound-bridge on a narrow rail, of a sound-board proper, disconnected from, but arranged and adapted to be pressed against or brought into contact with, said bridge-rail, substantially as described.

3. In a piano-forte, the combination of a sound-bridge on a narrow rail, a sound-board proper, disconnected from said rail, and means whereby said sound-board and said rail may be either gradually brought together or gradually moved apart or released from each other, substantially as and for the purpose set forth.

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