(No Model.)

# W. H. IVERS.

## PIANO KEY BOTTOM.

No. 382,471. Patented May 8, 1888.

Fig. 1.

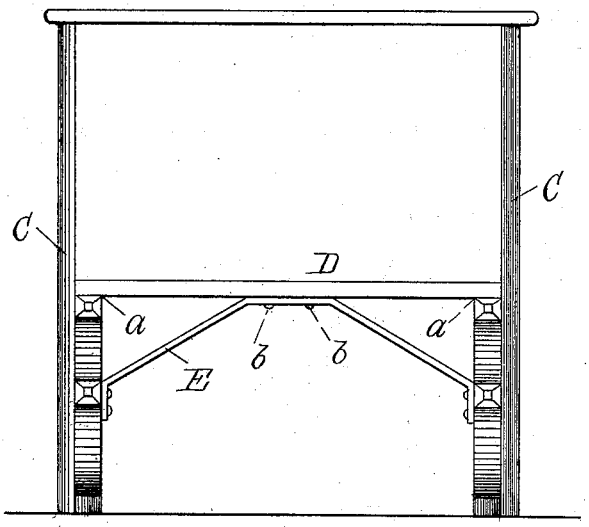



Fig. 2.

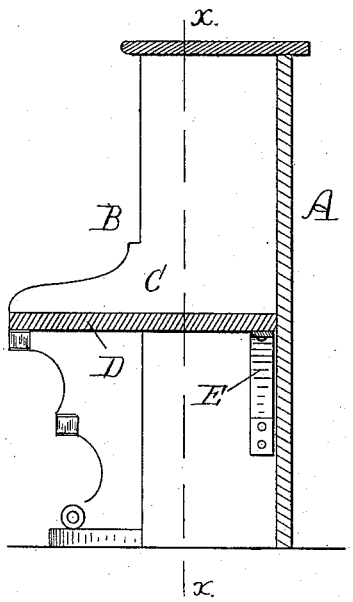
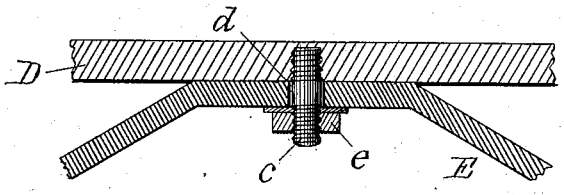



Fig. 3.




Witnesses.
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# UNITED STATES PATENT OFFICE.

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## PIANO KEY-BOTTOM.

SPECIFICATION forming part of Letters Patent No. 382,471, dated May 8, 1888.

Application filed October 3, 1887. Serial No. 251,273. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. IVERS, a citizen of the United States, residing at Dedham, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Piano-Fortes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to upright pianos, and is embodied in the mechanical features by which the "key-bottom," so called, is stiffened and supported centrally between the ends of the instrument.

The drawings represent, in Figure 1, a front view; Fig. 2, a vertical transverse section of a piano embodying my improvements. Fig. 3 is an enlarged view showing the adjustable mechanism by which the key-bottom is secured to the support.

Musical instruments of the class above mentioned are generally composed of two portions containing the various instrumentalities which, combined, form the piano as an entirety. For convenience of description these two portions may be divided by a vertical plane, *x x*, the portion marked A of which, to the rear of said plane, contains the frame, skeleton plate, strings, and sounding-board. The part in front (designated B) contains the key-bottom, keys, and "action," so termed.

The instrument is formed at the ends with two vertical pieces, C C, which form a portion of the case, and between which is horizontally disposed the key-bottom D. The latter consists of a solid rectangular piece of wood; or it may be made up of a series of strips firmly glued together. As an entirety it is permanently secured to the ends C C of the case at a point about midway between the top and bottom of the instrument. When said key-bottom was loaded with the keys and action, it became very liable to yield or spring centrally, consequent upon jars or shocks resulting from transportation or removal of the instrument, while, furthermore, changes in its position frequently occurred, due to varying atmospheric influences.

Since the entire weight of the keys and action is sustained by the key-bottom, their proper position and adjustment relatively to the strings are likewise dependent upon the rigidity and permanency of said key-bottom, and it is evident to those skilled in the art that the result of any disturbance in the position of the key-bottom affects the adjustment throughout the entire series of keys, the action, and the strings which co operate therewith; hence the object of my invention is to support the key-bottom not only at its extremities *a a*, where the latter are joined to the end pieces, C C, but also centrally, where no support hitherto has been given. This I effect by means of the metallic brace or strut E, which is centrally bolted to the key-bottom at *b b*. The opposite ends of said brace are bolted or otherwise fastened to the end pieces, C C, of the piano-case. This brace or truss may be varied in shape longitudinally, as well as in cross-section, to conform to circumstances. To more permanently secure and retain the key-bottom in a certain fixed position, or to enable adjustment thereof, if required, to be readily effected, I have inserted a bolt, *c*, permanently in the key-bottom. When thus positioned, said bolt extends downwardly, passes freely through a hole, *d*, bored in the brace E, and projects beyond. This protruding part is screw-threaded and furnished with a nut, *e*. When the brace or support E has been firmly secured to the end pieces, C C, the key-bottom can be adjusted centrally in horizontal planes by the movement of the nut on the bolt; hence it is evident that any tendency to rise or fall, in fact any movement which may cause it to deviate from its normal horizontal position, can be controlled by the brace in conjunction with the adjusting bolt or bolts. By this arrangement a wooden key-bottom can be rendered as stiff and permanent as one made entirely of metal, and is very much lighter. Moreover, the brace, which extends downwardly upon the ends C C of the case, serves to render the latter part of the instrument more rigid, while

at the same time affording a permanent support to the key-bottom centrally, as hereinbefore premised.

One prominent advantage in this method of supporting the key-bottom by means of the brace E, it will be observed, consists in securing the two extremities of said brace to the end pieces in which the fiber composing them is set vertically. Therefore the brace is upheld by end wood, which affords the greatest resistance to a load, and there is consequently little or no tendency to spring, yield, contract, or expand.

What I claim and desire to secure is—

1. In piano-fortes provided with a key-bottom and the end pieces to which said key-bottom is secured, a metallic brace, substantially as described, affixed to said end pieces and contiguous to the key-bottom centrally, whereby the latter is supported and adjusted, as and for the purposes specified.

2. In musical instruments of the class herein specified, a horizontal key-bottom, D, having its ends permanently fixed, in combination with a brace, E, with its ends likewise fixed, and the interconnecting adjusting-nut *e* and bolt *c*, which unite the two, substantially as stated.

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

WILLIAM H. IVERS.

Witnesses:

H. E. LODGE,

F. CURTIS.