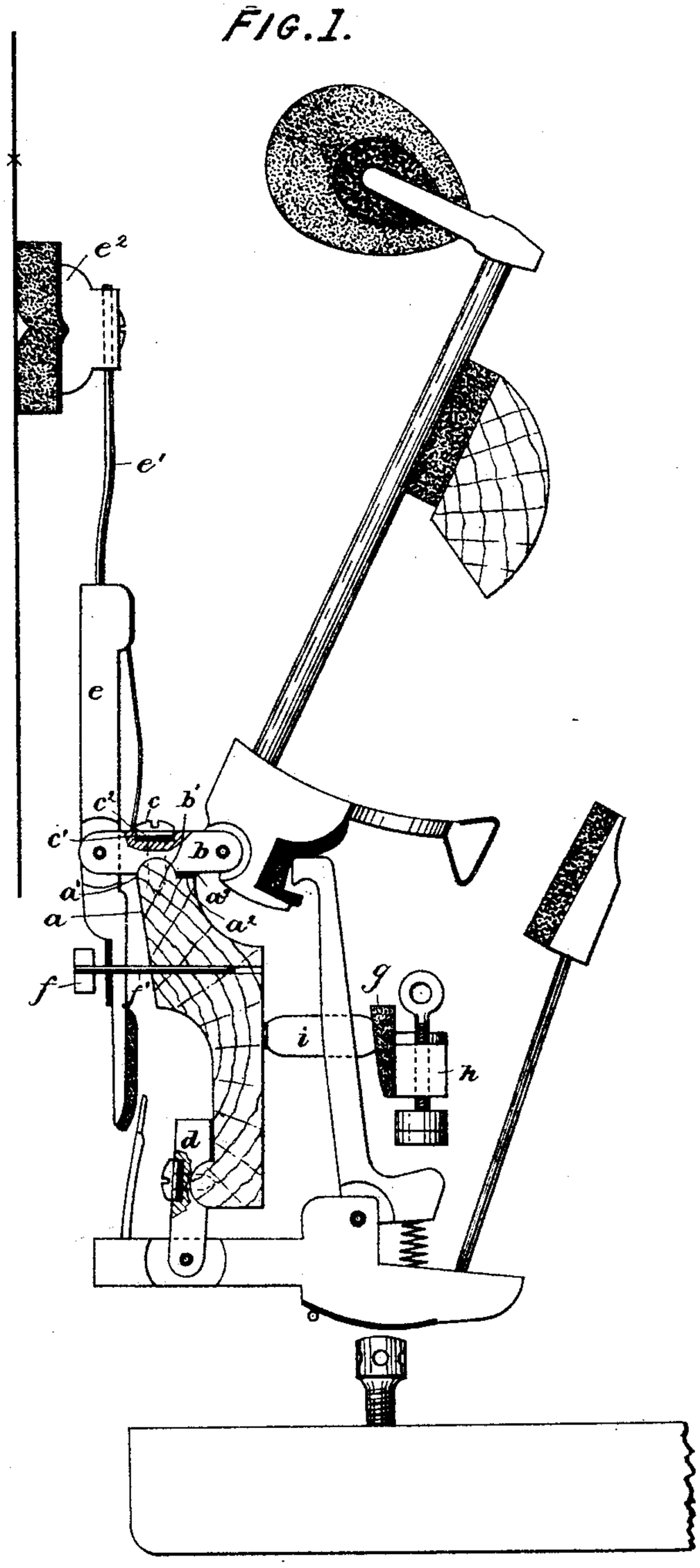
(No Model.) 2 Sheets—Sheet 1.

A. H. HASTINGS.

PIANO ACTION.

No. 457,714. Patented Aug. 11, 1891.

FIG. 1.



WITNESSES:

Edward R. Knowles.

E. Irving Carr.

INVENTOR

Azariah Horace Hastings.

BY Ernest Cubbe.

ATTORNEY.

(No Model.) 2 Sheets—Sheet 2.

A. H. HASTINGS.

PIANO ACTION.

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FIG. 2.

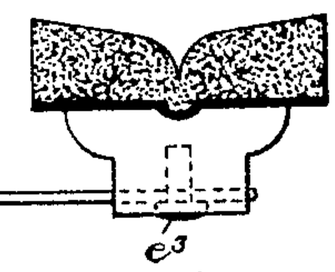


FIG. 3.

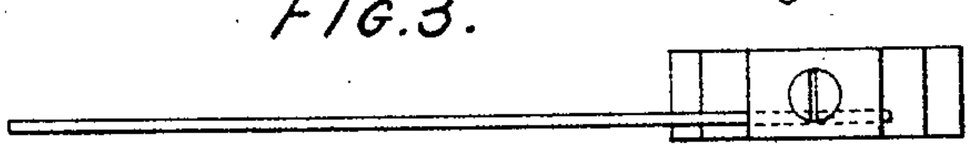


FIG. 4.

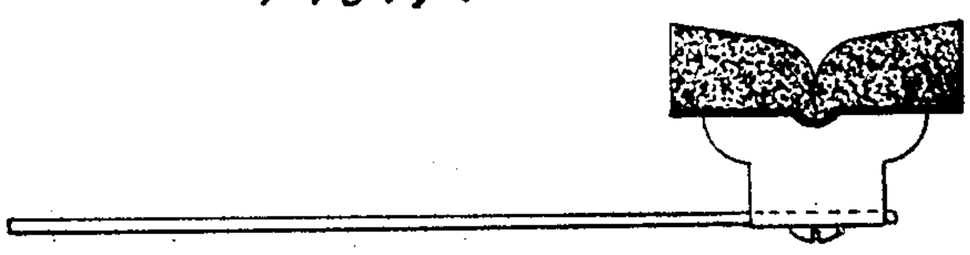


FIG. 5.

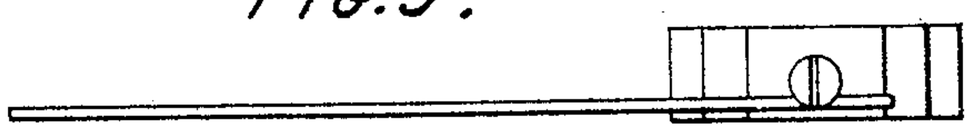


FIG. 6.

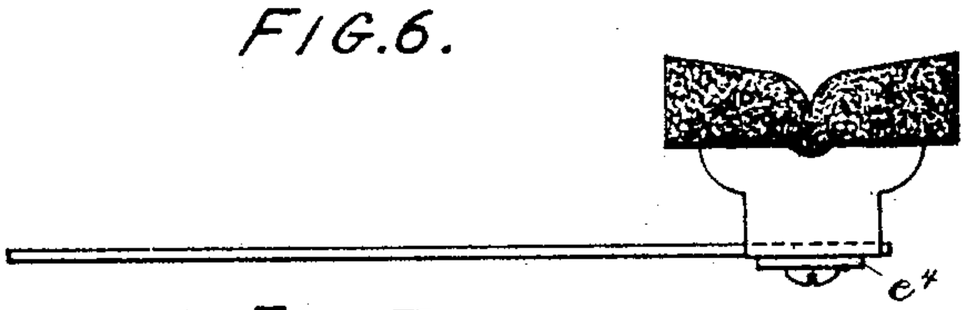


FIG. 7.

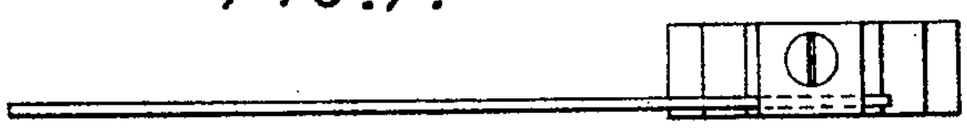


FIG. 8.

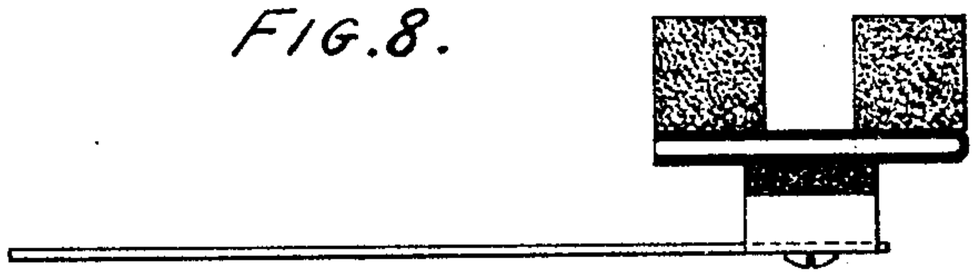
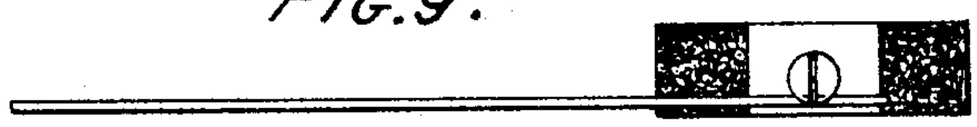


FIG. 9.



WITNESSES:

Edward R. Knowles.

O Irving Carr

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UNITED STATES PATENT OFFICE.

AZARIAH HORACE HASTINGS, OF NEW YORK, N. Y.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 457,714, dated August 11, 1891.

Application filed July 23, 1890. Serial No. 359,664. (No model.)

To all whom it may concern:

Be it known that I, AZARIAH HORACE HASTINGS, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Piano-Actions, of which the following is a specification.

This invention relates to certain improvements in piano-forte actions, and more especially to actions for upright pianos, which combine as nearly as possible the quality and effect of a grand-piano action.

The invention comprises certain details of construction of the action, which will be particularly pointed out and claimed in the claims forming part of this specification, and therefore need not now be more fully set forth.

In the accompanying drawings, illustrating my invention, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation with some parts in cross-section, and Figs. 2 and 3, 4 and 5, 6 and 7, and 8 and 9 represent four different forms of damper, in side and front views, respectively.

The action-rail *a* is provided with a rounded bead *a'* and a flat shoulder a^2 to receive a hammer-flange *b*, and this hammer-flange is provided with a groove *b'*, complemental in shape to the bead *a'* of the action-rail. The hammer-flange is secured to the action-rail by means of a screw *c*, passed through the said flange in line with its groove and with the bead of the action-rail; and I prefer to interpose between the head of the screw *c* and the hammer-flange a washer or piece of flexible material *c'* and a metal washer c^2, and I prefer to countersink the washers *c'* and c^2 into the hammer-flange. By constructing the action-rail with the bead and shoulder and the hammer-flange with the complemental groove I am enabled to set the hammer-flange down upon the bead of the action-rail with a firm bearing, reduce its thickness, and thereby reduce the liability of the flange to get loose by shrinking. The shoulder a^2 is provided with an elastic cushion a^3, and this cushion and the elastic washer or cushion *c'* prevents noise—that is to say, deadens the parts. The countersinking of the screw *c* into the hammer-flange also reduces the liability of changing in those parts. The jack-flange *d* may be similarly applied to the action-rail.

The damper-lever *e* is pivoted to the hammer-flange and has an extension-wire *e'*, to which is secured the damper-block e^2. This damper-wire *e'* is bent in order to secure the proper regulating. This damper-wire *e'* may be connected with the damper-block in any suitable manner; but I prefer to make in the said damper-block a longitudinal hole or passage or else a longitudinal groove, as shown, respectively, in Figs. 1 to 4 and Figs. 5 to 9. Where the block is provided with a hole or passage for the extension-wire, a screw e^3 is let into a screw-hole made at right angles to the wire hole with its head countersunk in the damper-block, so that the under flat side of said head will bear directly upon the extension-wire, firmly in the damper-block, and so secure the parts together. Where a groove is employed, the screw e^3 will be passed into the damper-block at right angles to the said groove with the head of the said screw bearing against the wire. Moreover, as shown in Figs. 6 and 7, a washer or metal plate e^4 may be interposed between the screw-head and the wire to unite them.

The form of damper shown in Figs. 8 and 9 is the one usually employed in connection with the overstrung section of a piano and contains that form of my invention in which the extension-wire lies in a groove in the damper-block and is held therein by a direct contact of the screw-head therewith. By my construction of extension-wire and the screw-head applied directly thereto and pressing firmly upon it there is no wood intervening between the extension-wire and screw-head to shrink or swell, and the strain is pulling the wood together instead of straining it apart, as in other constructions.

The damper-levers are provided with a damper stop-rail *f*, running the length of the action and secured to the action-rail by means of wires *f'*. The proper adjustment of this stop-rail may be secured by driving the said wires more or less into the action-rail. If the wires should be driven too far into the action-rail, they may be projected by inserting a punch into the action-rail from the wire-open-

ings in the front of such rail. This damper stop-rail checks the travel of the damper-levers beyond the required distance, and enables me to make solid pinned centers in both the damper-levers and hammer-butts instead of having to make plate centers, as have been employed before and which are always getting noisy and working out in dry rooms. Moreover, the stop-rail greatly facilitates the removal of parts and renders access to them for regulation or repair very easy without the necessity for detachment. In this connection, also, it will be observed by the use of the hammer-flange screws access to the hammer-rail for regulating, &c., is rendered very ready.

Instead of attaching a cushion to each jack and one to each bumper or attaching a separate rail, which requires extra regulating and complication for checking the overtravel of the jack, I employ a cushion *g* on the regulating-rail *h*, the said cushion being of suitable thickness to leave the regulating-rail in its proper position and at the same time to afford a proper stop for the jacks, and I make this cushion extend the full length of the rail, and may be in one piece. By this construction the cushion cannot come off and needs no regulating. Moreover, the cushions may be in one piece instead of two to each note, making one cushion instead of the one hundred and seventy-eight separate cushions heretofore required.

The regulating-rail *h* is provided with a regulating-screw *i*.

Parts shown in the drawings but not herein particularly specified may be of usual construction.

What I claim is—

1. In a piano-forte action, the action-rail provided with a bead curvilinear and preferably semicircular in cross-section, having on one side a flat surface or shoulder, combined with a hammer-flange having a groove complemental in shape to the bead of the action-rail and fitted thereto, substantially as shown and described.

2. In a piano-forte action, the action-rail provided with a bead curvilinear and preferably semicircular in cross-section, having on one side a flat surface or shoulder, combined with a hammer-flange having a groove complemental in shape to the bead of the action-rail and fitted thereto, and cushions interposed between the said shoulder on the rail and flange and their connecting mediums, substantially as shown and described.

3. In a piano-forte action, a damper-lever and a damper-block, combined with an extension-wire inserted in the block and secured therein by means of a screw, the head of which binds the said wire in the block by impinging directly upon said wires, substantially as shown and described.

4. In a piano-forte action, the combination, with the action-rail, of a damper-lever stop-rail arranged in the rear of said action-rail and adjustably secured thereto, substantially as shown and described.

5. In a piano-forte action, a damper-lever and a damper-block, combined with an extension-wire inserted in a groove in the block and secured therein by means of a flat metal plate or washer screwed to the said block, substantially as described.

Signed at New York city, in the county of New York and State of New York, this 2d day of June, A. D. 1890.

AZARIAH HORACE HASTINGS.

Witnesses:

THORNE S. WALLING,

EDWARD R. KNOWLES.