(No Model.)

L. W. NORCROSS

PIANO ACTION.

No. 454,976. Patented June 30, 1891.

Fig. 1.

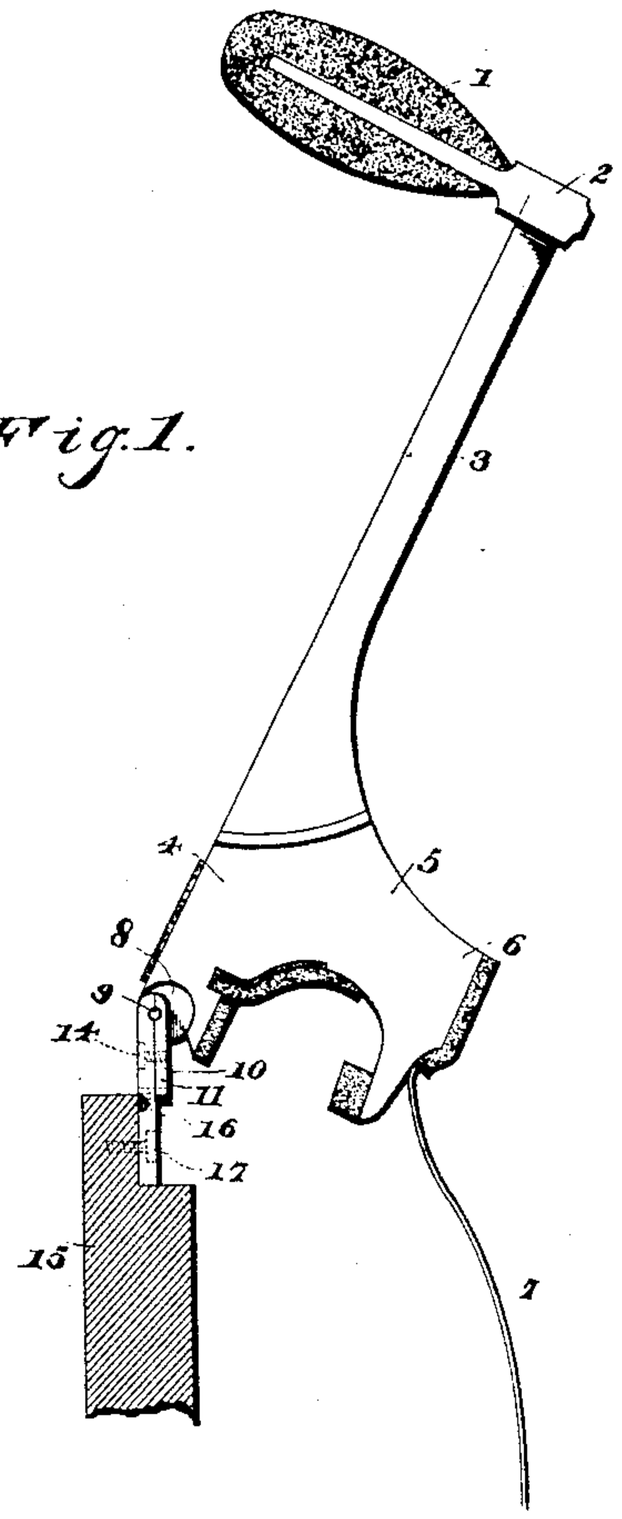


Fig. 2.

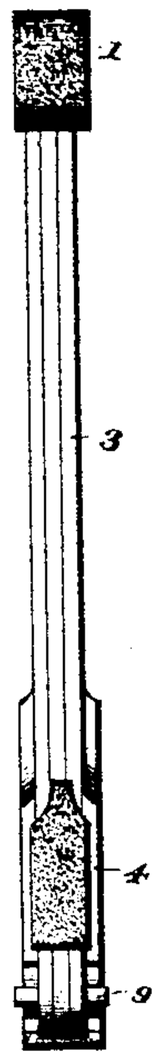


Fig. 3.

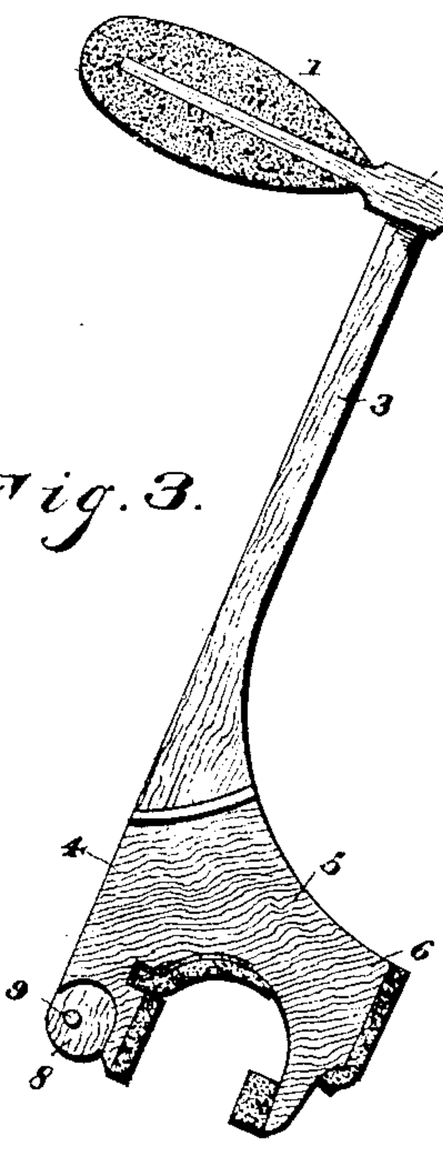


Fig. 4.

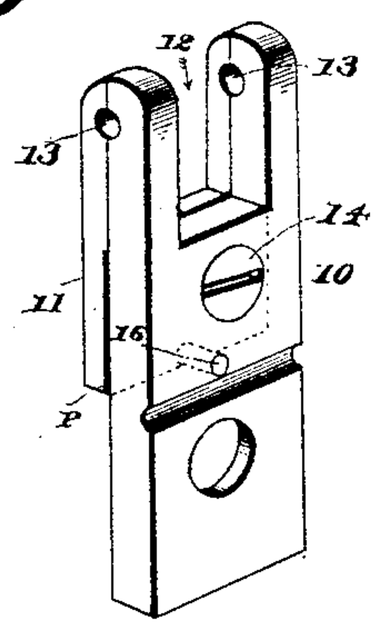
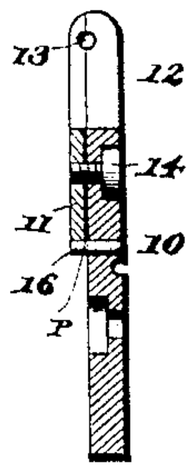


Fig. 5.



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UNITED STATES PATENT OFFICE.

LEVI W. NORCROSS, OF FORT WORTH, TEXAS.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 454,976, dated June 30, 1891.

Application filed April 3, 1890. Serial No. 346,454. (No model.)

To all whom it may concern:

Be it known that I, LEVI W. NORCROSS, a citizen of the United States, residing at Fort Worth, in the county of Tarrant and State of Texas, have invented a new and useful Piano-Action, of which the following is a specification.

This invention relates to piano-actions, and more particularly to the so-called "hammers" used therein; and the invention consists in the specific means for pivotally connecting said hammers to the rail. In carrying out these ideas I make use of certain details of construction and arrangements of parts, which also form parts of the present invention, all as will be more particularly described hereinafter.

In the accompanying drawings, which illustrate only so much of the complete piano-action as is necessary, Figure 1 is a side elevation of the action, showing my improved hammer in place therein. Fig. 2 is an enlarged plan view of my improved hammer. Fig. 3 is a detail illustrating the manner of connecting and assembling the parts and the grains of the different woods employed in its building. Fig. 4 is an enlarged perspective detail of the clamp, and Fig. 5 is a longitudinal section of the same.

Referring to the said drawings, 1 represents the hammer-felt, which strikes the wires, as will be understood.

2 is the hammer-head, 3 the hammer-shank, and 4 the base of the hammer. These parts comprise the hammer proper.

The numeral 5 represents what is known as the "short shank;" 6, the back-check; 7, the bridle-tape, and 8 are cut-away portions in the sides of the base 4, in which is a pin 9, by which the hammer is connected to the hammer-rail.

Coming now to the present invention, 10 is a preferably metallic clamp, which is detachably secured to the preferably metallic rail 15 by the screw 17. 11 designates the lower jaw of this clamp, which is adjustably attached to the clamp proper by a set-screw 14 and whose inner end has a notch engaging a pin 16, projecting from the lower face of said clamp. Both members are recessed longitudinally at their ends, as at 12, whereby the portion 8 of the base 4 will fit therein, and they are provided with transverse registering-grooves 13, which clamp the opposite sides of the pin 9 at both ends, all as will be described hereinafter. The rail and clamp being of metal, preferably of finely-tempered steel, no expansion and contraction can occur therein with varying temperatures, and as the pin 9 is rigidly seated in the base 4 and turns in the metallic grooves 13 the disagreeable use of felt bushing around their journals is avoided. I have not deemed it necessary to describe the other parts of the action, as their uses will be apparent to those skilled in the art, and they form no part of the present invention.

The faults with hammers and hammer-butts in use at the present time, and more especially with those in the upright piano, may be plainly stated, and are attributable to the manner in which they are constructed and their susceptibility to the varying degrees of heat and cold or wet and dry atmosphere, causing the hammer-shanks to warp and twist, thus diverting the hammer-head from a true line with the strings to the extent that it will miss one, and sometimes two, of its group of three. This wears away the hammer-felt at one side, producing an imperfect tone, a wabbling and shaky stroke of the hammer, which in turn has a damaging effect upon other and relative parts of the action. The cloth bushing around the pivot-pin is objectionable for the reasons that it is more or less subject to swell and shrink as the different causes may act upon it, and when swollen the touch becomes hard and the action of the hammers sluggish. To remedy these serious defects and provide a hammer and clamp that will remain the same under all the varying conditions and in any locality or temperature, I construct the hammer preferably as described below.

The hammer-shank 3, base 4, short shank 5, and back-check 6 will be constructed either of one solid piece of wood or of a number of veneers of any preferred wood unlike in fiber and of different degrees of hardness glued together and cut to the form required, the base 4 of the shank forming the shoulder by which the hammer is operated, and its outer projection the back-check. The cross-section of the shank 3 is preferably oblong, having a width

greater than its thickness in the direction the hammer is operated, to secure a maximum strength with a minimum weight, and also to more securely hold in place the hammer-head 2, which may be conveniently removed when new heads are wanted.

The hammer-clamp 10 and pivot-pin 9, by which the hammer is connected with the rail, as above mentioned, comprise the present invention, and are preferably used in connection with a hammer such as described. These parts are made of metal, preferably of best quality of steel, the slotted end 12 of the clamp being supplied with a second piece 11 of same material and shape to form a jaw or clamp, and held in place by a guide-pin 16 and regulating-screw 14. The inner surface of each of these jaws is also provided with a transverse groove 13 in both sections, made to exactly correspond with the pivot-pin 9 and held slightly open by an elastic packing P, of thin sheet-felt, rubber, or bushing-cloth, surrounding the screw 14 and admitting of regulating the tension thereon. The pivot-pin 9 will be fastened securely and firmly in its place at the cut-away portion 8 in the base of the hammer-shank, as shown in the drawings, its projecting ends being free for the motion of the hammer. The advantages of this hammer-clamp and pivot-pin are that, being of finely-tempered steel and perfectly fitted in all parts, they are not subject to the ordinary wear and will remain in perfect order for an indefinite period of time, no cloth or other perishable material being used for bushing, and the extra size of the pivot-pin, the superior metal employed, and the perfect adjustment of the parts render the precision of the stroke of the hammer absolute and invariable and the touch of the key uniform under all conditions, climatic or otherwise.

The butt of the hammer is another piece of the piano-action that in case it becomes warped tends to destroy the perfect action and successful working of the instrument from the above-mentioned desirable results, and I prererably construct this butt as follows: Upon each side of the hammer-shank 3 and on its outer face is glued a piece of wood that is dressed down to one-eighth of an inch in thickness, although the thickness may be more or less, according as use necessitates. The grain of these extra pieces forming the base is preferably at an angle to that of the shank of the hammer of about forty-five degrees, in order that this may the more effectually prevent the warping of the parts, as well as their cracking or breaking. Of course, if preferred, the shank may be of one solid piece with the base-pieces applied thereto, or the shank may be built of a number of pieces, and the outer ones at each side may be left thicker to form the re-enforce of the base.

Any suitable portion of the action may be built up of a number of pieces of wood of different degrees of hardness or susceptibility to heat and cold and moisture.

What I claim is—

1. In a piano-action, the rail 15, the clamp 10, removably attached to the rail, and a pin 16, projecting from the under face of the clamp, in combination with the jaw 11, having a notch in its lower end engaging said pin, and the adjusting-screw 14, connecting said members, and with a hammer having a pivotal pin journaled between the meeting faces of said members, substantially as and for the purpose set forth.

2. In a piano-action, the rail 15, the clamp 10, removably attached thereto, and a pin 16, projecting from the under face of the clamp, in combination with the jaw 11, having a notch in its lower end engaging said pin, the elastic packing P between said jaw and clamp, and the adjusting-screw 14, passing through said packing and connecting said members, and with a hammer having a pivot-pin journaled between the meeting faces of said members, substantially as described.

3. In a piano-action, the rail 15 and the clamp 10, removably attached thereto, in combination with the jaw 11, the elastic packing P between said jaw and clamp, and the adjusting-screw 14, passing through said packing and connecting said members, and with a hammer having a pivot-pin journaled between the meeting faces of said members, substantially as described.

4. In a piano-action, the rail 15, the clamp 10, removably attached thereto, and a pin 16, projecting from the under face of the clamp, in combination with the jaw 11, its lower end engaging said pin, and means for adjustably connecting said members, and with a hammer having a pivot-pin journaled between the meeting faces of said members, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

LEVI W. NORCROSS.

Witnesses:
THOS. BRUTTON,
JAS. F. PROSSER.