

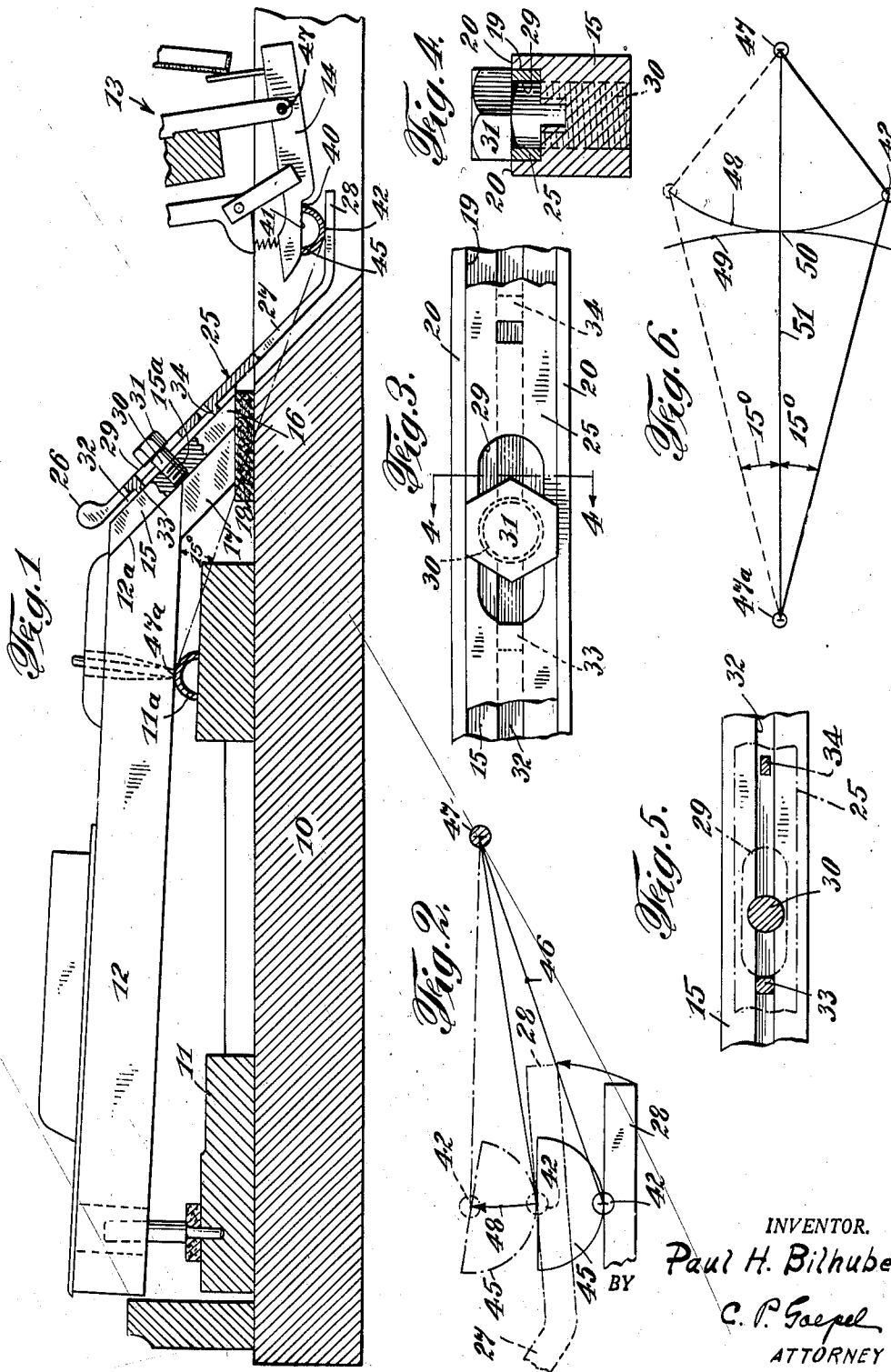
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OPERATING MEANS FOR PIANO ACTION

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OPERATING MEANS FOR PIANO ACTIONS

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This invention relates to piano actions and more particularly to an improved operating means for piano actions, and preferably to the adjusting device between the key and the action proper.

The object of the invention is to provide a decrease in the height of an upright piano without adversely affecting the touch of an action mechanism, and under maintenance of the beneficial area of the respective arcs of the key and the proper action.

The invention consists in the means for striking the action proper upon the operation of the key. Smaller modern upright pianos are improved by raising the keyboard since more height is provided for the limbs of the player. Attempts in this direction have resulted in diminishing the quality of the touch of the piano action. The improved means permit the raising of the keyboard under maintenance of the touch of the piano action. More particularly, the invention consists in forming an extension on the key at the rear of its pivot, which extension forms a seat which is so disposed that when adjusted in respect to the pivot, its action contact point moves in a substantially straight line, up or down, to act as a striker in the same manner as the known key strikes the action; the radius of curvature of the contact point in respect to the whip pivot always remaining the same notwithstanding the adjustment of the extension. The arrangement of parts is such that the beneficial area of the respective arcs of the key and whip are retained and a very small area is utilized, the sphere of action being as close to the ideal as mechanically possible, the tangential contact point of these arcs being the ideal.

The invention will be further described, embodiments thereof shown in the drawing, and the invention will be finally pointed out in the claims.

In the accompanying drawing—

Fig. 1 is a side view of a piano key and parts of a piano action to which the improvement has been applied;

Fig. 2 is a diagrammatic view of the displaced key extension, showing its contact point with the whip of the piano action;

Fig. 3 is a plan view of the adjustment mechanism of the extension of the key for longitudinal adjustment thereof;

Fig. 4 is a transverse action on line 4-4 of Fig. 3;

Fig. 5 is a plan view of the block of the adjustment mechanism, showing one projection

smaller than the other to permit lateral adjustment in addition to the aforesaid longitudinal adjustment, and

Fig. 6 is a diagrammatic view of the ideal beneficial arc area.

Similar characters of reference indicate corresponding parts throughout the various views.

Referring to the drawing, the known frame keyboard 10, and keyboard 11, and keys 12 are shown, in cooperation with parts of the known action generally designated by 13. As the parts of this action are known they need not be referred to in detail, save only such parts as cooperate with the improvement.

The improvement consists in cutting the key 12 at 12a in an inclined direction and securing a block 15 thereto by glue, or any other suitable fastening means. This block 15 extends below the key as shown by 16. It has a screwthreaded hole 15a. Behind the block 15 is a filler block 17 to strengthen the extended part 16, the filler 17 being glued to the part 15 and to the lower surface of the key 12. A piece of cloth 18 of the usual kind is glued to the frame 10, to dampen the shock of the filler 17 and the part 16 of the block 15 when the front end of the key is released and the rear end of the key drops to its normal position, after the front end of the key has been depressed.

The face of the wooden block 15 has a groove 19, formed by parallel shoulders 20, and these act as guideways for a metal stamping extension 25 consisting of the elongated member having a holding knob 25, at one end, and a part 27 extending below the block 15 and bent at its lower end at an angle to the part 27 to form a striker plate 28. The member 25 has an elongated slot 29 of a width to permit a bolt 30 to pass freely therethrough which bolt 30 by its head 31 may be rotated so that its exterior screw threads engage the interior screwthreads 15a of the block 15. The face of the groove 19, has a slot 32 to guide projections 33 and 34 at the lower surface of the member, the projection 34 being slightly narrower than the projection 33. This permits a lateral angular shifting of the member 25 should such be desired, before the bolt is finally tightened. This is clearly shown in Fig. 5, wherein the member 25 is shown in dotted lines, phantom-like. The lateral adjustment is slight, sufficient to space the striker plate 28 laterally under the action whip button 45.

The whip 14 of the known piano action generally indicated by 13, is provided with a cut away portion 40 and upon the seat 41 there is

secured a semi-circular button 45. The tip 42 of the button 45 when joined by a line 46 to the pivot 47a of the whip forms one of the basic lines in Fig. 6. The bent end 23 in any of its positions is always tangential to the button 45 at the tip 42; though the position of the tangential point on the bent end 23 may change depending on the raising or lowering of the member 25.

When the forward end of the key 12 is pressed, the end 23 is raised and the button 45 of the whip 14 is raised, and the piano action set into operation. The change made in the whip is the cut-out 40 and the application of the button 45 to the seat 41.

In Fig. 6 is shown the ideal beneficial area within which it is desired to work. The shorter radius of curvature is formed by the lines 42—47, 47 being the pivot of the whip and 42 the peak of the button, and this radius of curvature forms the arc 48. The other radius of curvature is from the pivot 47a of the key 12 where the key 12 rests on the button 11a to the point on the part 28 where the button 45 contacts therewith. With the pivot 47a as a center, an arc 49 is formed. The tangent point of the arcs 48 and 49 is at 50. The beneficial area is 15° either way of the line 51 connecting the pivots 47a and 47, with the apex of each of the angles at 47a. A positioning of parts to bring about a tangent at 50, with the radii in alignment is the ideal condition.

In the actions used to a large extent heretofore as part of an upright piano, the whip and the interconnecting parts were arranged above the plane of the keys. The arc passed through by the free end of the whip, which was pivoted at 47, corresponded to that in Fig. 6, which is above the line 47a and 47. The inner end of the piano key of standard construction passed through the arc 49 above the line 47a and 47. Thus, a play of 15° was the range within the arcs of the key and whip. Of course, as is well known, the pivot of the whip was not as shown in Fig. 6, but in a higher position. In the improvement, the range of play of the whip arc and key extension arc, is in the field of 15°, but below the horizontal. This is shown in Fig. 2, where the radius 46 passing through the pivot 47 and contact 42, when in one position (the lower position as shown) is moved through about 15° to the upper full line position. Thus, a position at the lower limit of the 30° gives substantially the same touch characteristic, any intermediate position giving an improved touch. In the improvement, however, the 15° below the horizontal is shown and availed of, or some point may be taken less than the 15° below the horizontal to further improve the touch, and by placing it below the horizontal, a considerable distance in the height of the keyboard frame is made available giving more room for the knees of the player. As has been pointed out the touch characteristics are not diminished by the change in height, but may actually be improved if less than the full 15° below the horizontal.

Among the advantages of the improvement are an actual reduction of friction with touch improvement in limits of two inches in action position; the wedge or angle movement of the key

extension allows for take-up or adjustment for lost motion in the action; the point or position of the point of contact is retained and "touch" is undisturbed or improved; there is less wear, the flatter cushion on the larger flat surface of the key extension minimizes the "sinking" through depressions of cushion and thus requires less frequent adjustment or regulation; it is also better than the pilot button or capstan; and finally, the practical gain in the lower position of the action, other things being equal, is about 2 or 3 inches additional gain in height of the keyboard, without expense of touch, due to the decrease in friction due to the bent (angle) lever-age of the extension member.

I have described several forms of my invention, but obviously various changes may be made in the details disclosed without departing from the spirit of the invention as set out in the following claims.

What I claim is:

1. An improved operating means for piano actions, comprising an angular member applied to the rear of a key, said angular member having projections, said key being cut off inclined to its longitudinal length, a block applied to said end, guides in said block for said angular member, said block having a slot for the projections of said angular member, and a headed bolt passing through the angular member and engaging said block, whereby the angular member may be moved longitudinally within said guideways when the bolt is loose, and be fixed in position on the tightening of the bolt.

2. An improved operating means for piano actions, comprising an angular member applied to the rear of a key, said angular member having projections, said key being cut off inclined to its longitudinal length, a block applied to said end, guides in said block for said angular member, said block having a slot for the projections of said angular member, and a headed bolt passing through the angular member and engaging said block, one of said projections being narrower than the other, whereby the angular member is moved laterally when the bolt is loose, by the play between the slot of the block and the narrower projection.

3. In a piano having a pivoted piano key, and a piano action having a whip with a free end and pivoted at the other end, the combination with said key and whip, of a member having one part supported by the key at the rear of its pivot and extending downwardly therefrom, and having another part extending rearwardly from the first part to form a horizontally disposed portion extending beneath the free end of the whip, and a member on the free end of the whip of circular contour in free and unconnected contact with the adjacent upper face of said horizontal part, the pivot of the whip being disposed in relation to the upper face of said horizontal portion so that said upper surface is tangentially disposed to the circular contour in all positions of the whip, the point of the tangent travelling on the circular contour from the initial to the end position of the horizontal portion.

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