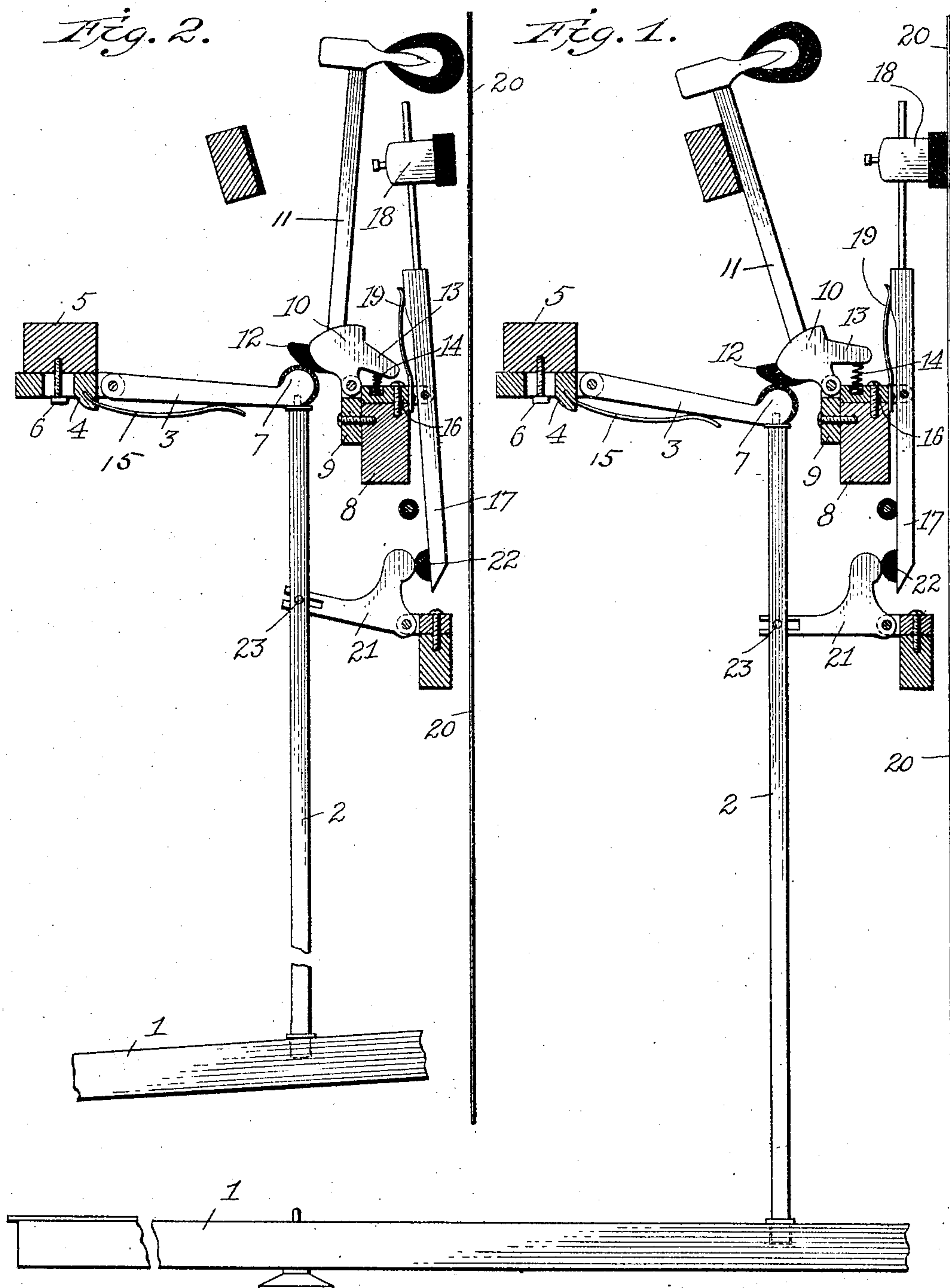


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C. W. BREWER.
PIANO ACTION.

APPLICATION FILED JULY 15, 1904.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES W. BREWER, OF RACINE, WISCONSIN.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 786,407, dated April 4, 1905.

Application filed July 15, 1904. Serial No. 216,714.

To all whom it may concern:

Be it known that I, CHARLES W. BREWER, a citizen of the United States, residing at Racine, in the county of Racine, State of Wisconsin, have invented certain new and useful Improvements in Piano-Actions, of which the following is a specification, reference being had therein to the accompanying drawings, in which—

10 Figure 1 is a vertical sectional view showing the parts in the positions they occupy when the piano-key is in its normal position; Fig. 2, a similar view showing the parts in the positions they occupy when the piano-key
15 is depressed.

This invention relates particularly to piano-actions for upright pianos; and one of its many objects is to so construct the parts thereof as to permit of a rapid repetition of notes
20 without an undue depression of the keys, the hammer-butt and the hammer-actuating means being so constructed as to permit of the operation of the hammer in all its positions and in all positions of the actuating-keys, except
25 of course when the hammer-head is in direct contact with the string.

Another object of the invention is to provide means whereby the stroke of the hammer may be increased or diminished.

30 Other equally important advantages and objects of the invention will appear hereinafter.

To the accomplishment of these objects and such others as may hereinafter appear the invention consists of the parts and combination
35 of parts hereinafter fully described, and particularly pointed out in the appended claims, reference being had to the accompanying drawings, forming a part of this specification, in which the same reference characters designate like parts throughout both views.

Referring to the various parts by numerals, 1 designates the piano-key, to the rear end of which is loosely connected the vertical lifter-bar or abstract 2. The upper end of
45 this abstract loosely engages the under side of a rearward-extending hammer-operating lever at the rear end thereof. The forward end of this lever is pivotally secured to the rear end of a backward and forward adjustable
50 plate 4, said plate being secured to a cross-

rail 5 by means of a screw 6, which passes through a slot in said plate. The rear end of the hammer-actuating lever is formed with a substantially circular head 7.

Secured to the face of the hammer-supporting rail 8 is a plate or flange 9, in the upper end of which is pivoted a hammer-butt 10, from the upper end of which projects the upward and forward extending hammer-shank 11, which carries at its upper end the usual
60 hammer-head. The hammer-butt is formed with the forward and downward curved cam-surface 12, which is adapted to contact with the upper end of the substantially circular head of the hammer-actuating lever.
65

The cam-surface 12 of the hammer-butt is so proportioned that a part of it will be in position to be engaged by the head of the hammer-actuating lever when said lever is raised by the key, so that the hammer may be
70 caused to strike the string any number of blows in rapid succession without the necessity of permitting the hammer and the key to return to their normal positions of rest.

By means of the slot in the plate 5 and the screw which secures said plate to the supporting-rail it will be readily understood that the point of contact between the operating-lever and the cam-surface of the hammer-butt may be brought toward or from the pivot of the
80 hammer and that consequently the stroke of the hammer may be increased or diminished, as desired.

The hammer-butt is provided with a rearward-extending arm 13, in the under side of
85 which is formed a socket to receive the upper end of an expansible coil-spring 14, whose lower end is supported by the hammer-supporting rail, said spring serving to normally hold the hammer away from the string. To
90 the under side of the plate 4 is secured a rearward-extending leaf-spring 15, whose rear free end bears lightly on the under side of the hammer-actuating lever 3, said spring merely serving to support the lever 4 lightly
95 in contact with the cam-surface of the hammer-butt and to relieve the key of the weight of said lever.

Secured to the top of the hammer-supporting rail is a rearward-extending flange or
100

plate 16, to the rear end of which is pivoted the vertical damper-carrying lever 17. To the upper end of this lever is adjustably connected the damper 18. A leaf-spring 19 is
5 connected at its lower end to the flange 16, its upper end bearing lightly against the damper-carrying lever and holding the damper against the string 20.

To instantly remove the damper from the
10 string when the key is depressed, an angle-lever 21 is pivoted below the damper-lever in such position that one of its members will extend vertically in front of the lower end of said damper-lever and normally bear against
15 a cushion 22, whose forward surface is convex. The upper end of the vertical member of the lever is substantially circular where it bears against said cushion, so that when said lever is actuated to move the lower end of the damper-lever rearward there will be little, if any,
20 friction between the two parts. The other member of the angle-lever extends forward horizontally and is slotted at its forward end to receive a pin 23, which extends horizon-
25 tally from the lifter-bar or abstract. From the foregoing it will be readily seen that when the key is depressed the abstract will immediately swing the angle-lever and cause it to withdraw the damper from the string.

The cam-surface of the hammer-butt is so
30 curved and proportioned to the substantially circular head on the end of the actuating-lever as to secure a small point of contact between these two parts during the movement
35 thereof to reduce the friction of parts sliding on each other.

From the foregoing it will be readily understood that this piano-action is extremely simple and that the hammer-actuating lever and
40 the hammer-butt will lie always in operative position, so that the hammer may be caused to repeatedly and in rapid succession strike the string with a very slight depression of the key. It will also be understood that the fric-
45 tion between the operating parts will be reduced to a minimum because of the small points of contact between the operating-levers and other moving parts.

It will be apparent to those skilled in the
50 art that various mechanical embodiments of the invention are possible, and therefore I do not wish to be limited to the exact arrangement and construction shown.

Having thus described my invention, what
55 I claim as new, and desire to secure by Letters Patent, is —

1. In a piano-action the combination of a

key, a pivoted hammer provided with a hammer-butt having a downward and forwardly curved surface, a hammer-actuating lever hav- 60 ing a substantially circular head at its free end adapted to contact with the curved surface on the hammer-butt, whereby said parts will have a small point of contact during their movement, and an abstract interposed between the 65 key and the hammer-actuating lever.

2. In a piano-action the combination of a key, a pivoted hammer provided with a hammer-butt having a downward and forwardly curved surface, a hammer-actuating lever hav- 70 ing a substantially circular head at its free end adapted to contact with the curved surface on the hammer-butt, whereby said parts will have a slight contact during their movement, an abstract interposed between the key and the 75 hammer-actuating lever, and means for normally holding the hammer-actuating lever and the hammer-butt in yielding contact.

3. In a piano-action the combination of a key, a pivoted hammer provided with a hammer-butt having a downward and forwardly curved surface, a hammer-actuating lever hav- 80 ing a substantially circular head at its free end adapted to contact with the curved surface on the hammer-butt, whereby said parts will have a slight contact during their movement, an abstract interposed between the key and the 85 hammer-actuating lever, and means for adjusting the hammer-actuating lever, toward and from the pivot of the hammer. 90

4. In a piano-action the combination of a key, a pivoted hammer provided with a hammer-butt having a downward and forwardly curved surface, a hammer-actuating lever hav- 95 ing a substantially circular head at its free end adapted to contact with the curved surface on the hammer-butt, an abstract interposed between the key and the hammer-actuating lever, a damper-carrying lever, a damper-actuating-lever formed with a substantially circular head, a convex cushion on the damper-carrying lever and adapted to be engaged by the 100 substantially circular head of the damper-actuating lever, and means for operatively connecting the damper-actuating lever to the abstract. 105

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 12th day of July, 1904.

CHARLES W. BREWER.

Witnesses:

W. W. ROWLANDS,
DAVID G. JAMES.