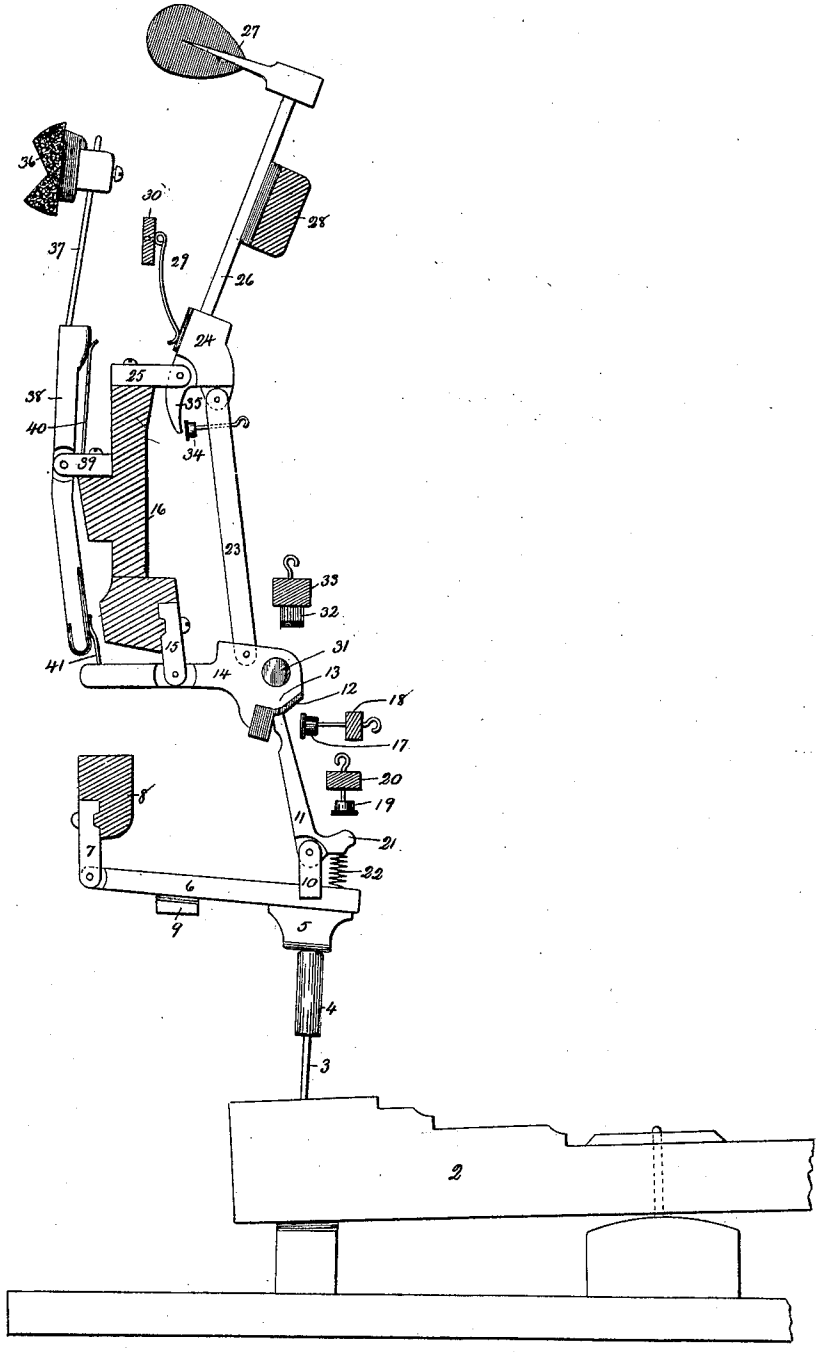
No. 679,485. Patented July 30, 1901.

M. STEINERT.

UPRIGHT PIANOFORTE ACTION.

(Application filed Mar. 5, 1901.)

(No Model.)



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UNITED STATES PATENT OFFICE.

MORRIS STEINERT, OF NEW HAVEN, CONNECTICUT.

UPRIGHT-PIANOFORTE ACTION.

SPECIFICATION forming part of Letters Patent No. 679,485, dated July 30, 1901.

Application filed March 5, 1901. Serial No. 49,912. (No model.)

To all whom it may concern:

Be it known that I, MORRIS STEINERT, of New Haven, in the county of New Haven and State of Connecticut, have invented a new Improvement in Upright-Pianoforte Actions; and I do hereby declare the following, when taken in connection with the accompanying drawing and the figures of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawing constitutes part of this specification and represents a view, partly in elevation and partly in vertical section, of an upright-pianoforte action constructed in accordance with my invention.

My invention relates to an improvement in upright-piano actions, the object being to transform the pianoforte of to-day from a pure instrument of percussion, which it may now be said to be, to an instrument in which the strings are excited in vibration by a stroke rather than by a blow, with all the difference in tone quality thereby signified.

With these ends in view my invention consists in a pianoforte-action having certain details of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In carrying out my invention as herein shown the piano key-lever 2 is furnished at its inner end with a threaded pilot-rod 3, receiving a pilot-head 4, which is adjustable upon the rod and which engages with a felt-faced tappet 5, located upon the forward end of the jack-lever 6, the rear end of which is pivoted to a butt 7, secured to a jack-lever rail 8. A felted jack-lever rest-rail 9 is located in position to normally support the jack-lever and take the weight imposed thereupon by other parts of the action. At its forward end the jack-lever is furnished with a jack-butt 10, in which is pivotally mounted the jack 11, the extreme upper end of which coacts with the felt cushion 12 applied over the obtuse-angled escapement-face 13, formed upon the lower edge of the forward end of the horizontally-arranged hammer-lever 14, which is pivoted to a hammer-lever butt 15, secured to the hammer-rail 16. The forward movement of the upper end of the jack is limited and controlled by an adjusting-button 17, mounted in a rail 18, while the escapement of the jack is positively effected by means of an adjustable button 19, mounted in a rail 20 and engaging with a short arm 21, extending forwardly from the lower end of the jack, which is returned to its normal and operative position by means of a spiral spring 22, interposed between the arm 21 and the upper face of the forward end of the jack-lever 6. A hammer-lever link 23, arranged nearly vertically, is pivotally attached at its lower end to the forward end of the hammer-lever 14 and pivotally attached at its upper end to the hammer-head 24, which is pivoted in a horizontally-arranged hammer-butt 25, secured to the upper end of the hammer-rail 16. A hammer tail or arm 26, mounted in the hammer-head 24, carries the hammer 27, which is of ordinary construction. A felted hammer rest-rail 28 is located in the usual position for affording a rest for the hammer. A hammer-spring 29, secured to a hammer-spring rail 30, engages with the hammer-butt 24 and operates to assist in restoring the hammer to its normal position, in which it is also assisted by gravity. If desired, this action may be further assisted by a weight 31, mounted in the hammer-lever 14.

To prevent the hammer itself from trembling directly after its impact with the string, I employ an adjustable button 32, mounted in a rail 33, in position to engage with the upper face of the forward end of the hammer-lever 14, as well as an adjustable button 34, mounted in the upper end of the hammer-lever link 23 and engaging with a horn or finger 35, extending downwardly from the hammer-head 24 from a point directly below its pivot. My improved action is also provided with a damper 36, adjustably mounted upon a damper-rod 37, located in the upper end of a damper-lever 38, pivoted in substantially a vertical position in a hammer-lever butt 39, secured to the hammer-rail 16. A spring 40, secured to the butt 39, engages with the rear edge of the upper arm of the lever 38 and exerts a constant effort to hold the damper 36 in contact with the string, from which the damper is retired by the coaction with the lower arm of the lever 38 of a wire finger 41, mounted in the rear end of the jack-lever 14, which when its forward end is elevated has its rear end depressed, with the effect of swing-

ing the damper-lever 38, so as to withdraw the damper 36 from the string.

It will be seen from the foregoing description, taken together with the drawings, that my improved upright-piano action is distinguished by simplicity of construction and accessibility for adjustment and repair. It will be further noted that the jack does not act directly upon the hammer-head, as in the ordinary pianofortes, whereby they become instruments of percussion, but that the jack acts through the medium of a hammer-lever positively connected with the hammer-head by means of a hammer-lever link. This construction makes the action of the hammer a stroke rather than a blow and refines the stroke by making it less direct and aggressive without any substantial loss of power. Under my improved construction, also, the hammer is not released and allowed to fall back upon the hammer-rest rail when the key has been depressed to the full extent, but rather is held in close proximity to the string in such a position that by a slight vibration of the key while in its depressed position the hammer may be utilized to excite the string in vibration by a series of strokes running from extremely slow strokes to those of the most rapid repetition.

My improved action by reason of its peculiar construction is very powerful and singularly easy, natural, and free. It is difficult to describe just the quality of touch which it secures; but to describe that touch as being "easy," "natural," and "free" gives an idea of its quality.

By uniting and combining together, as it were, the several elements of the train constituting the action, whereby they may be said to be articulated after the manner of the bones of the arm, wrist, and fingers, I am enabled to control the hammer in a way not possible in the ordinary instrument, in which the impact of the jack upon the hammer-head sends the hammer flying through the air to strike the string. With my controlled action the performer is able to bring himself into complete rapport with the instrument and to secure effects of tone-color corresponding to his own musical instinct and feeling. I need not say that my action enables the performer to secure crescendo, diminuendo, portamento, legato, and color and tone effects beyond the reach of performers except those of the highest technical skill.

It is apparent that in carrying out my invention some changes in the construction herein shown may be made, and I would therefore have it understood that I do not limit myself thereto, but hold myself at liberty to make such changes as fairly fall within the spirit and scope of my invention.

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

1. In an upright-pianoforte action, the combination with a key-lever, of a jack-lever operated thereby, a jack pivotally mounted in the said lever, a hammer-lever, a hammer-head carrying a hammer, and a hammer-lever link pivotally connected with the hammer-lever and pivotally connected with the hammer-head.

2. In an upright-pianoforte action, the combination with a key-lever, of a jack-lever operated thereby, a jack pivotally connected with the jack-lever, a hammer-lever operated by the jack, a hammer-head carrying a hammer and provided with a depending finger or horn, a hammer-lever link pivotally connecting the hammer-lever and the hammer-head, a regulating-button mounted in the upper end of the said link and coacting with the said horn, and a regulating-button coacting with the hammer-lever, the said buttons being constructed and arranged to prevent the vibration of the hammer after its impact with the string.

3. In a pianoforte-action, the combination with a key-lever, of a horizontally-arranged jack-lever operated thereby, a jack pivotally connected with the forward end of the jack-lever, a horizontally-arranged hammer-lever with the forward end of which the jack coacts, a hammer-head carrying a hammer-rod supporting a hammer, a hammer-lever link pivotally connected with the hammer-lever and hammer-head, and means coacting with the hammer-head and hammer-lever for controlling the vibration of the hammer after its impact with the string.

4. In an upright-piano action, the combination with a hammer-key, of a horizontally-arranged jack-lever operated thereby, a jack pivotally connected with the jack-lever, a horizontally-arranged hammer-lever provided with an obtuse-angled escapement-face with which the jack coacts, a hammer-head carrying a hammer rod or tail supporting the hammer, a hammer-lever link pivotally connected with the said hammer-head and with the forward end of the hammer-lever, means for preventing the vibration of the hammer after its impact with the string, a damper-lever, a damper carried thereby, and means connecting the damper-lever with the rear end of the hammer-lever by which it is operated in retiring the damper.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

MORRIS STEINERT.

Witnesses:
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