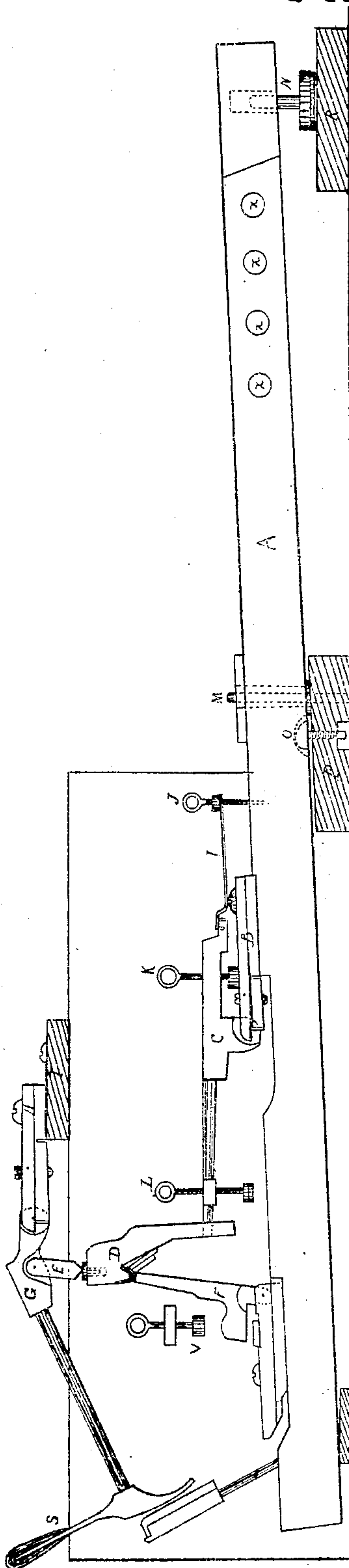


*A. B. Irving.*

## Piano-Forte Action.

N<sup>o</sup> 72738

*Patented Dec. 31, 1867.*



Witnesses:

Q. F. Mayhew  
A. J. Holmes

*Inventor:*

Alexander, B. Irving

# United States Patent Office.

ALEXANDER B. IRVING, OF INDIANAPOLIS, INDIANA.

*Letters Patent No. 72,738, dated December 31, 1867.*

## PIANO-FORTE ACTION.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, ALEXANDER B. IRVING, of Indianapolis, in the county of Marion, and State of Indiana, have invented new and useful Improvements in Piano-Forte Actions; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing, making part of this specification.

My invention relates to what is technically called the "action" of piano-fortes, consisting of the key and connecting mechanism, by which the hammer is actuated to strike the strings.

The novelty consists in making the knuckle, with which the jack engages, to raise the hammer, and which usually constitutes a part of the butt of the hammer-shank, a part of a separate elongated butt-piece, that is carried on the end of an adjustable vibrating-arm, of peculiar construction and arrangement, that is attached to the key; and in connection therewith, hinging a short vibrating-jack lever to the butt of the hammer-shank, the lower end of which rests on the top of the elongated butt-piece; the whole being arranged with a view to effect a more prompt and decisive blow from the hammer upon the strings, and to lessen the force required in "touching" or manipulating the keys, whereby rapid passages of music may be executed with greater ease and precision. The keys A are hung on stud-pins M, that rise from the rail P, and the hammers S are hung in jaws H, attached to the hammer-rail T in the usual manner.

My improvement consists in pivoting a short vibrating-jack, E, by its upper end, to the butt G of the hammer-shank, and resting its lower end on the top of an elongated butt-piece, D, that is carried on the end of a vibrating-arm, C, that is pivoted in jaws B, attached to the key A, as shown. The arm C is furnished with set-screws K and L, and a spring, I, the tension of which is regulated by set-screw J. The jack F and cast-off screw V, are arranged in the common manner, but the jack F is shortened so as to engage with the knuckle of the elongated butt-piece, which is arranged in the proper relation to the jack F for this purpose.

The drawing represents the several parts in the position of rest, and in readiness to actuate the hammer to strike the strings on touching the keys in the act of playing upon the instrument.

When the key is pressed down, the jack F, engaging with the knuckle of the elongated butt-piece D, raises it, and, through the medium of jack E, raises the hammer S with a prompt, forcible movement, to strike the string. The jack F is tripped from under the knuckle of butt D by the cast-off screw V, in the usual manner, and the arm C drops down, allowing the hammer to fall back from the string, so that it may vibrate freely. The distance to which the hammer descends is regulated by the set-screw L in the arm C, the lower end of which rests on the key A when the jack is tripped from under the knuckle of butt D. The wire spring I, pressing on the forward end of arm C, retains the hammer in the position to which it dropped, while the rear end of the key descends far enough for the jack F to re-engage with the knuckle of butt D, when the hammer drops to its proper position. The engagement of jack F with the knuckle of butt D may be regulated with great nicety, by means of the set-screws K, L, and J, which can be so adjusted that the jack may engage with the knuckle by the least practicable upward movement of the forward end of key A, and thus the action may be adjusted to repeat the blow of the hammer in such a manner that rapid passages of music may be executed with the greatest ease and precision. A wire projects from the lower end of jack E, that enters a hole in the top of butt D, as indicated by the dotted lines, to keep the jack from being displaced.

It will be observed that when the action is in a position of rest, as shown by the drawing, the jack E stands a little out of perpendicular, but when the key is pressed down to actuate the hammer, the jack is brought to a perpendicular, and hence in position to withstand the greatest strain. The movement of the elongated butt-piece D is also so slight that it is always in position for the jack F to readily engage with the knuckle thereon.

The arrangement of the jack E, butt D, and arm C, connecting the hammer S with the key A, just in the rear of the fulcrum M, causes the rear end of the key to drop promptly when the forward end is released from pressure without having to weight the rear end of the key, as is sometimes done, and hence great force is not required in manipulating the keys, and the force of the touch may be very nicely adjusted to the requirements of different performers by weighting the forward end of the key with plugs of lead, as indicated by the small circles x. Though not shown, I contemplate hanging the keys on a round-headed screw, as shown at O, just in the rear of stud-pin M, by means of which the height of the keys may be adjusted, and the surface of



the key-board levelled up. The lower end of the screw will be made square, and a recess made on the under side of rail P, by which to afford access to the screws.

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

The repeating-arm C, attached to the key A, and adjusted by means of the set-screws K L, spring I, and set-screw J, the butt D, attached to the arm C, and jack E attached to the butt-piece G of the hammer, the whole constructed and arranged substantially as set forth and described.

ALEXANDER B. IRVING.

Witnesses:

O. F. MAYHEW,

A. J. HOLMES.