

R. M. Kerrison,

Piano Action,

N^o 13,091.

Patented June 19, 1855.

Fig:1.

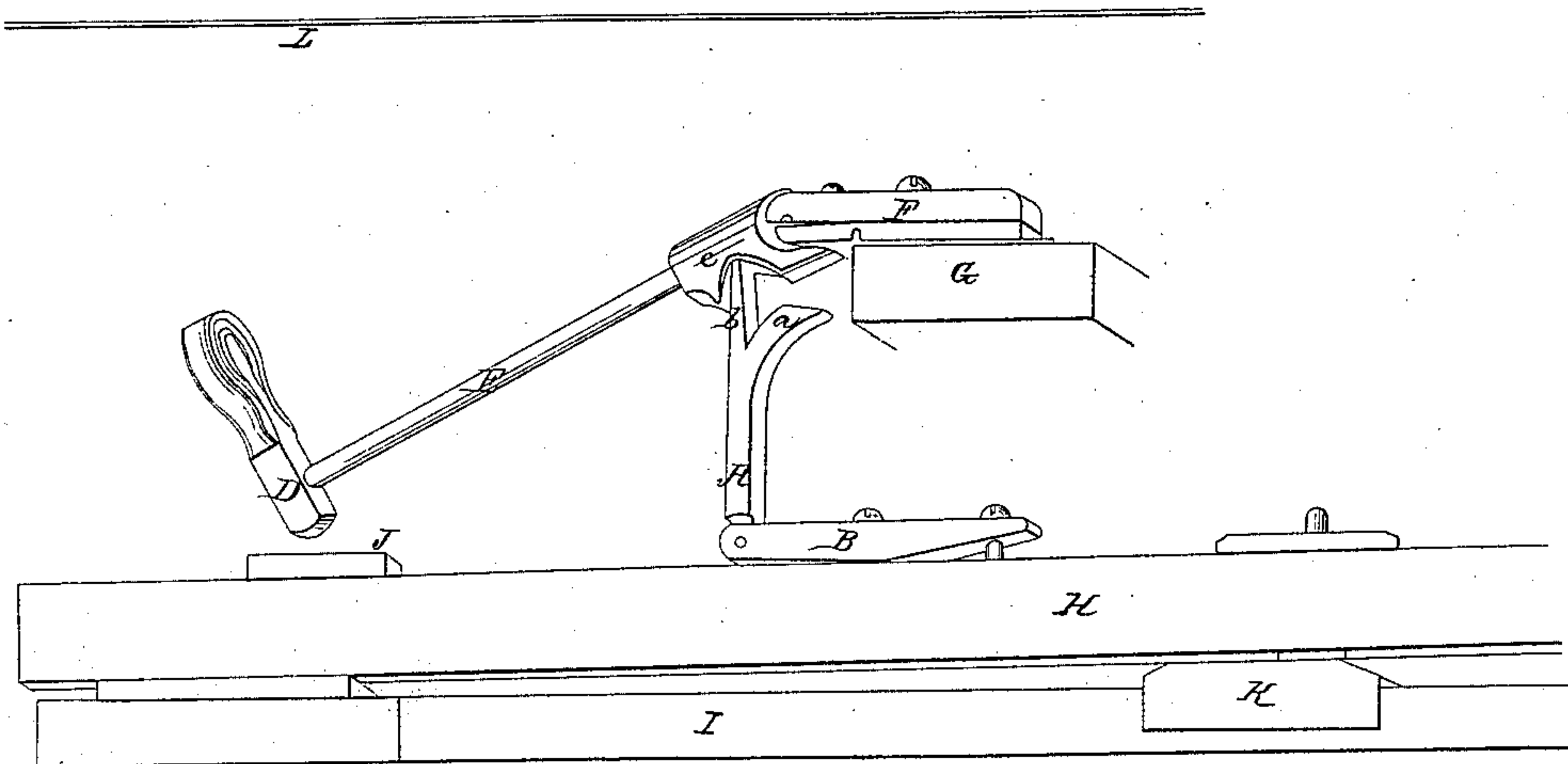
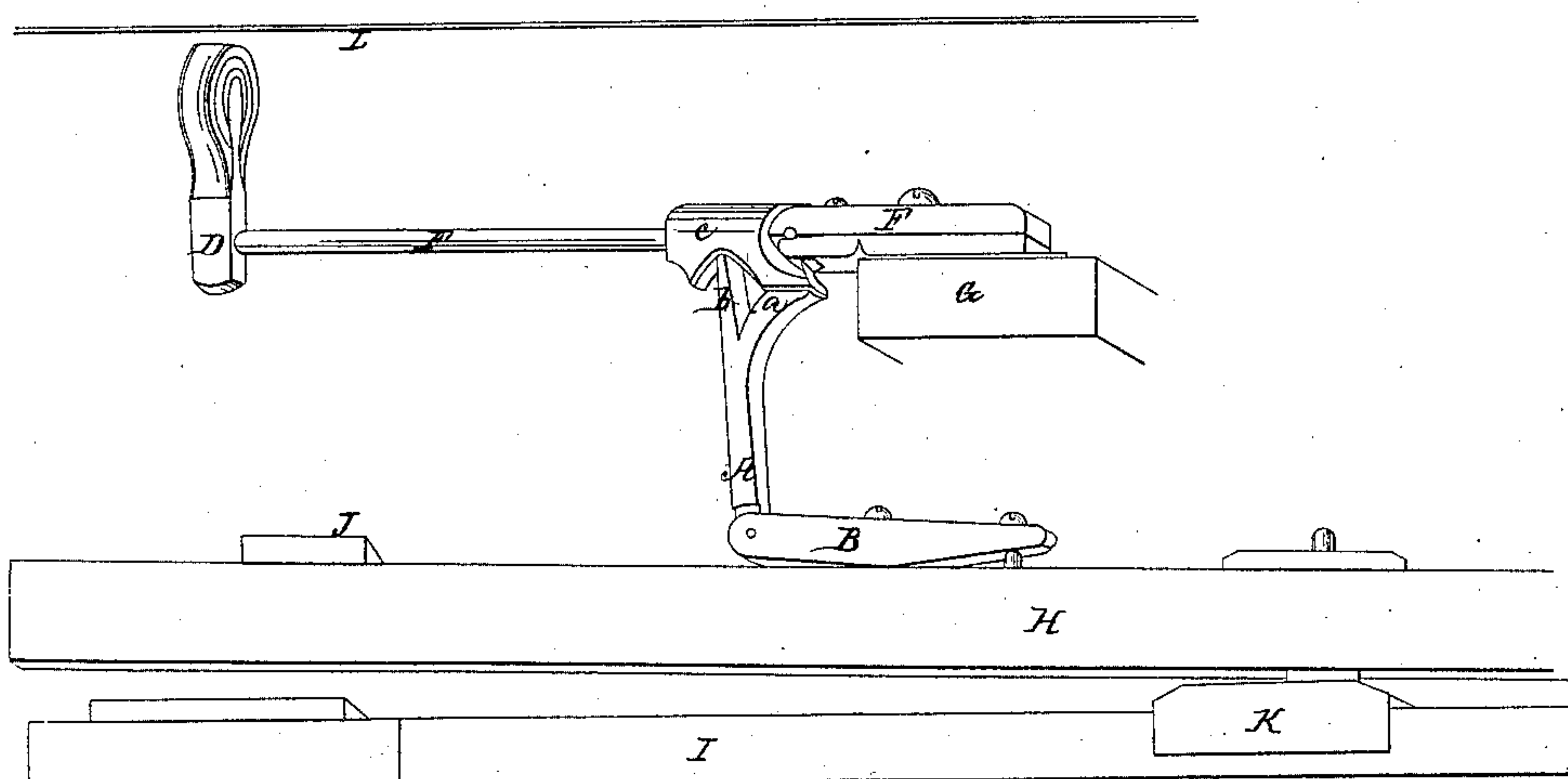


Fig. 2.



Witnesses.

N. P. Mills.
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UNITED STATES PATENT OFFICE.

ROBERT M. KERRISON, OF PHILADELPHIA, PENNSYLVANIA.

PIANOFORTE-ACTION.

Specification of Letters Patent No. 13,091, dated June 19, 1855.

To all whom it may concern:

Be it known that I, ROBERT M. KERRISON, of the city and county of Philadelphia and State of Pennsylvania, have invented an
5 Improvement on Pianofortes in That Part Thereof Known as the "Hammer-Action," which invention is equally applicable for the tongues or reeds of melodeons and also
10 hammers moved by finger-keys are required to strike sonorous or vibrating bodies; and I do hereby declare that the following is a full and exact description thereof, avoiding
15 prolixity, reference being had to the accompanying drawings and the letters of reference marked thereon.

The nature of my invention consists mainly in a new method of quieting the hammer after the blow, and holding it after
20 the blow at a position most favorable for rapid repetition.

The incidental advantages of this hammer-action, are: diminished expense of construction, by reason of the fewness and simplicity of part; durability in using consequent upon little friction; and permanency of what is technically termed the regulation.

For the convenience of a distinctive appellation I call my said invention the Eureka repeating hammer-action.

In order that others skilled in the art may be able to make and use my said invention, I shall proceed to give a description of
35 its application to a piano in which the hammers strike upward against the strings.

The lever known to piano-makers as the "key" may be arranged as usual; and the hammer may be hinged in its center pin as
40 usual, and consist of three principal parts viz: the butt, the shank, and the head. My hammer-butt is of peculiar shape, it has on the under side between the head and the center-pin, an angular notch clothed with
45 firm soft material. It is at the apex of this notch, that the impulse is applied to drive the hammer forward against the string; and this apex is one of the two points of pressure by which the hammer is held firm near the
50 string after a blow. The butt has an elongation on the opposite side of its center of motion, to that where the notch is placed; this elongation is below the plane of the center-pin. It is flat underneath, and the
55 flat face is clothed with thin leather or cloth.

The last mentioned part of the butt, and the hammer-head being respectively on opposite sides of the center of motion common to both of them, it is evident that when
60 either one goes up, the other must descend. The communication between the key below and the hammer above, is by means of a vertical piece, which I shall call the impeller. The impeller is hinged to a small block,
65 screwed on the key at that part thereof which is under the notch in the butt. The impeller stands vertical and the upper part branches into two parts. One of the branches of the impeller terminates upward
70 in a round smooth horizontal edge which stays always in the notch of the butt, and gives impulse to the hammer at the apex of the notch. The other branch of the impeller
75 is situated farther from the hammer-head; it is flat on top; and its business is to meet that part of the butt which descends during the upward progress of the hammer-head.

Now observe: A right line supposed to pass through the joint-pin of the impeller, and also through the center-pin of the hammer butt, may be appropriately termed the
80 neutral line; because no force acting in that line can turn the hammer-butt on its center either way. Of necessity the apex of the notch in the butt is out of this line; it is in
85 fact on that side which is nearer to the hammer-head: whereas the encounter of the flat end of the impeller, with the flat face of the butt, takes place on the other side of the neutral line. After a blow, if the key
90 has gone all the way, the upper extremities of the impeller are both in contact with the butt; that part which gave impulse being on one side of the neutral line; and the flat topped part on the other side thereof. Consequently their forces or pressures mutually
95 counteract, and bring the hammer to a state of quiescence at a position depending on the proportion of the several parts.

In this hammer-action, the distance of the
100 hammer-face from the string, when the hammer is held in check, is determined and adjusted in making and putting together the parts. The adjustment is very permanent, but a regulation of this item may be effected,
105 by moving the block to which the impeller is hinged backward or forward on the key, the screw-holes in the block being made oval for this purpose. When the player's finger is raised the hammer and the impeller go 110

down together. The impulse end of the impeller never goes out of the notch in the butt, and by allowing the hammer to recede ever so little from the checked position, the player can strike a new blow, in due proportion to the distance that he has allowed the hammer to fall: Hence results the great repeating capacity of this hammer-action. When the hammer is down all the way, the apex of the notch still bears on the top of the impeller; consequently there can be no loss of motion in the key; that is to say, the moment the player begins to depress a key, that same moment the corresponding hammer must begin to rise.

I have tried many different combinations of parts with my new mode of checking the hammer. The arrangement above described is preferable, on account of its extreme simplicity.

The above description refers only to pianofortes, and to such only, in which the hammers strike upward; but any one properly skilled in the art, will have no difficulty in applying my invention to hammers for any musical purpose, and acting in any required direction.

I am aware that Mr. Gilbert of Boston Mass. uses an action in which each hammer has a cushion, sustained and regulated by a screw that passes through the butt, below the frame of the hammer-center. The cushion moves horizontally as the hammer-head rises, and eventually by means of part of the impulse that raises the hammer, pushes the end of the fly-of-the-jack from the shoulder of the butt; thus allowing the hammer to fall or recoil, because the impediment is then out of the way. My invention is very distinct from this of Mr. Gilbert. My hammer receives impulse from the end of the impeller; and the butt does not push the impeller from the point where it gave impulse. Also my hammer-butt receives an after impulse, which may be termed the counter impulse, for its tendency is to pull or jerk the hammer-head away from the string or other body struck, and if the pressure of the finger be continued, the hammer becomes a fixture, it not being free to move in any direction until the pressure is relaxed.

References to the drawings.—Figure 1, represents a hammer, and parts relating directly to it. The hammer is down, the finger supposed to be off of the key. The touch part of the key is not represented. Fig. 2, is a view of the same, showing the hammer in check near the string, the finger supposed to be pressing the key.

The same letters in the two views, indicate corresponding parts.

I, is part of the frame, which is the foundation of the action; by means of which it is slid into, or out of the piano as though it were but one piece.

K, is the end of the balance rail; it is part of the frame just mentioned.

H, is the key, the finger touch not being shown.

B, is a block screwed onto the key; to it the impeller is hinged, and moving the block backward or forward on the key will alter the checking distance of the hammer.

A, is the lower end of the impeller, hinged to the block.

b, is that part of the impeller which always remains in the notch of the butt.

a, is the flat-topped branch of the impeller; it meets the flat face of the butt, when the blow is struck.

C, is the butt showing the notch, with the extremity of the impeller therein.

E, is the hammer shank.

D, is the hammer-head.

F, is the capsule, the piece to which the hammer is hinged.

J, is a soft cushion on the key, which cushion the hammer will sometimes strike when it is in violent motion.

L, is the string.

What I claim as my invention and wish to secure by Letters Patent, is—

1. Solely the means I employ to check and hold the hammer after the blow; I claim as part of those means the impeller, made of the form above described, and shown in the drawings, substantially in the manner and for the uses set forth in the specification.

2. I also claim the hammer-butt of the form described above, and shown in the drawings suitable and proper to receive the action or pressure of two parts or branches of the impeller at two different points in the manner and for the purposes substantially as set forth in this specification.

3. I claim the impeller and the hammer-butt, as above described or their equivalents and acting conjointly in the manner substantially as set forth in the specification; I claim them, I say, conjointly as a means of checking and holding the hammer after a blow.

R. W. KERRISON.

Witnesses to signature—

N. P. TRITT,

J. B. SAYERACH.