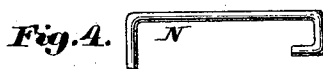
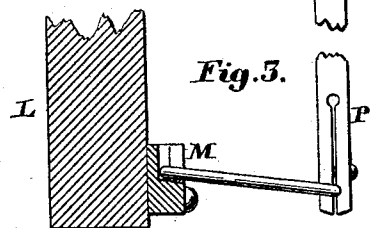
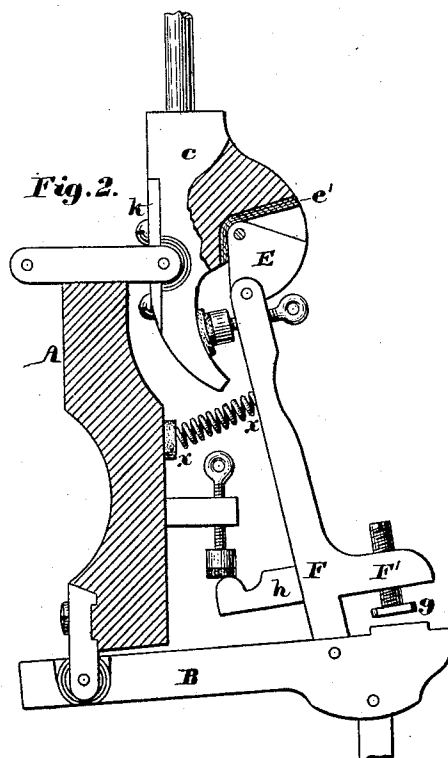
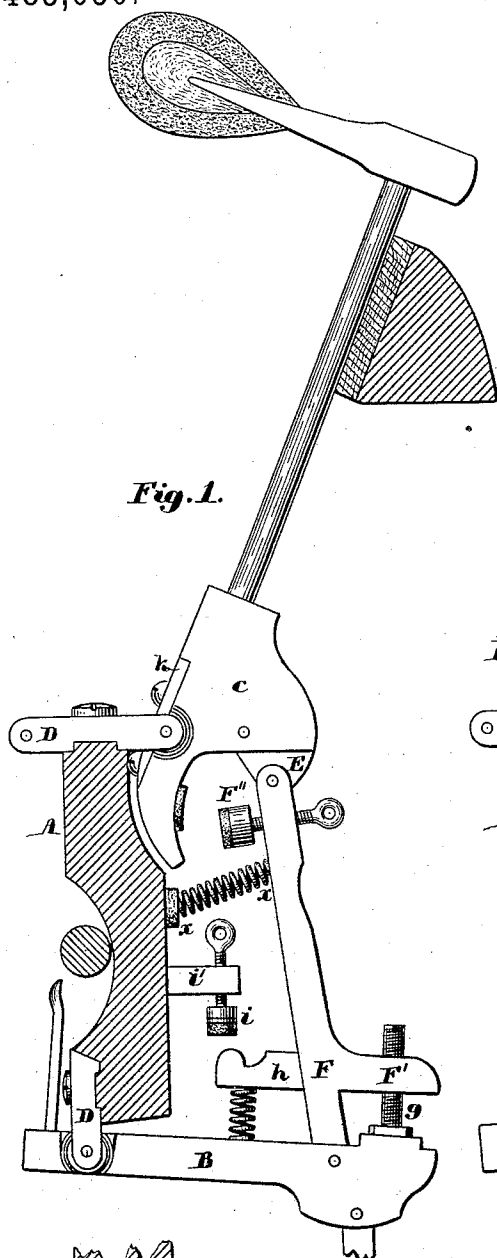


J. R. PERRY.
PIANO ACTION.

Patented Nov. 8, 1892.



Witnesses:
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UNITED STATES PATENT OFFICE.

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PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 485,650, dated November 8, 1892.

Application filed December 14, 1891, Serial No. 415,073. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH R. PERRY, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Pianoforte-Actions; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable those skilled in the art to which it appertains to make and use the same.

The object of my improvement is to effect a more definite and powerful stroke of the hammer by increasing the rapidity and strength of stroke at the point of string contact and having the key touch lighter at the start of the hammer and to produce a stroke when the keys are very close to the key-frame or by the least movement of the key. To cheapen the cost and increase the durability is also an object of my invention.

It consists in a novel construction of the hammer-butt and means whereby to produce a perfect back-check of the same to strengthen the pivot thereof.

It consists, also, of a novel device for connecting the working parts of the action by means of a vibrating disk, which has the property of forming a connection between the hammer-butt and the operating jack-lever, and has also the function of assisting the back-checking of the hammer and destroying the momentum of hammer when thrown in either direction.

It consists, also, in a peculiar construction of a jack-lever and its arrangement so that for a part of the stroke it has the property of rigidity; but as it nears the full stroke it becomes flexible and free to vibrate and adjust the parts to suitable positions in checking and holding the hammer-butt after it has rebounded from the string.

It consists, also, in a novel method of connecting and operating the pitman or rods running between the actuating-bar and keys, all of which is fully set forth and described in the accompanying specification and drawings, forming a part hereof.

I have for illustrations Figures 1, 2, 3, 4, and 5, made in side and front elevations. Figs. 1 and 2 refer to the mechanism proper, and

Figs. 3, 4, and 5 to the connecting-rod device. Fig. 1 represents the action at rest or at the beginning of a stroke, and Fig. 2 when the stroke has been made and the action checked and held by pressing the key upon the key-frame at the end of a stroke.

The same letters in each figure refer to similar parts in each.

A represents the action-rail, to which the actuating-bar B is attached and the hammer-butt C by means of the flanges D D. The hammer-butt C and actuating-bar B are connected by means of a vibrating disk E and the jack-lever F. The jack-lever is formed of several parts. It has an arm F', extending to the right hand, which contains a regulating-screw g, having a flat head inserted from below upward to be used in adjusting it with reference to the vibrating disk E. It has an arm h, extending to the left-hand side, and a spiral spring affixed to the under side of said arm and securely resting upon the actuating-bar B. If, however, the same spring is placed against the action-rail A and upper end of the jack-lever F, as seen, the one under arm may be dispensed with, or both used, if desired. The jack-lever F is pivoted to the bar B, so that the spring will act in holding the right arm upon the actuating-bar B. When the jack-lever is in proper place, its upper end will form an angle with the pivots of the vibrating disk E. This angle is determined by means of the regulating-screw g and the spring under arm h, or the spring against the jack and action-rail. It will thus form a rigid support when the key is pressed or the pitman-rod moved upward until the alignment of the pivots in the jack-lever and vibrating disk takes place, at which time the arm h will come in contact with the buffer i of the action-rail block i' and quickly free the jack-lever F by throwing it toward the piano-strings, thus forming an angle on the opposite side. As this angle may be made greater than the first one, it follows that it must draw the hammer away from the string, so that immediately when it rebounds by the stroke the jack-lever, vibrating disk, and buffer F'' in the end of jack-lever will catch the extended part of the hammer-butt and hold it rigidly in check until the piano-key is let return, when the

spring under arm *h* will quickly replace the jack-lever into its former rigidity ready for another stroke. The same would be effected by the spring acting against rail and jack.

5 The regulating-screw *g* and buffers *i* and *F'* will determine the proper angle and adjustments required to effect the above-named operations by adjusting the proper time when to convert the rigid into a free jack-lever. When
10 the vibrating jack is set free, the hammer should be within a short distance of the piano-string, so that when the alignment of the pivots takes place and the stroke is made the hammer is caught while having the least rebound and consequent momentum.

The vibrating disk *E* has the functions of a lever, connecting-bar, and back-check, and also as a take-up of momentum by breaking the force of the motion against cushions or
20 packing placed in the hammer-butt *e'*. I do not confine myself to any particular form of this vibrating disk. It will be seen, also, that to perform the above-described action or operation the hammer-butt has a peculiar formation, to wit: It has an extended part running
25 below its pivot and made with a suitable shape to aid in producing the back-check of the hammer when it rebounds from the string. It is so curved and shaped to suit the buffer.
30 It is routed out on the front end in order to receive the vibrating disk *E* and the packing *e'*. This packing prevents the strain upon the pivots of jack and disk in both directions, front and rear. In consequence of the extended and
35 curved portion of the hammer-butt it enables me to add greater strength to the pivot. This I do by extending the strap, usually of metal, below the hammer-butt pivot and securing the same thereto by a screw placed into the
40 same on each side of the pivot and upon it, thus firmly holding it in place.

In Fig. 2 the outer portion of the hammer-butt is shown in section, so as to expose to view the vibrating disk *E* and packing *e'* and the routing of the same. The operation is
45 briefly this, to wit: When the piano-key is struck against the pitman, it raises the actuating-bar *B*, which is forced upward, carrying the rigid jack-lever in a curved line toward the piano-strings, and the vibrating
50 disk *E*, acting against the hammer-butt, throws the hammer forward until the pivots in the jack-lever and vibrating disk are placed in alignment. At this moment the
55 arm *h* will strike against the buffer *i* of the rail-block *i'*, and thereby overcome the spring or springs, which will quickly throw the top of jack-lever *F* and disk *E* against the under side of or extended part of the hammer-butt and hold it in check. This will
60 take place immediately after the hammer has hit the piano-wire and made a short rebound. The buffer or such other device in connection with the jack will then hold the hammer in
65 check until the pressure is removed from the key, when the spring or springs will cause the jack-lever to rest firmly upon the actu-

ing-bar *B*, ready for another stroke, as seen in Fig. 2.

The pitman-holding device is constructed 70 and operated as follows, (shown by Figs. 3, 4, and 5:) Letter *L* in Fig. 3 represents a rail, usually secured to the brackets. (Not shown.) On the side of said rail is a strip *M*, running the whole length of the action. This strip 75 has a groove run into it lengthwise large enough to admit of any desired size of link or loop *N*, Fig. 4, which is formed from suitable wire. It is bent with a right angle at one end and a right-angle loop at the other. 80 The strip having been cut in cross-section to suit the size of this wire and enough larger to admit of packing and spaced to suit the piano-keys is then ready to have the loops placed therein, the right-angle ends resting 85 in the above-named groove, after which it is secured against the lower action-rail *L* with screws to any desired place thereon. The pitman-rods *P* are split and the pivots packed with cloth, when the wire loops are forced 90 into the split ends and secured by means of a screw, as shown. This will allow them to vibrate in moving the pitman *P*. They may be easily bent with pliers to suit the keys should any slight variation occur which could 95 not be so easily adjusted by any other method. Fig. 5, letter *O*, shows a front view of the grooved strip and loops according to the spacing for keys.

Having thus fully described my invention, 100 what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a pianoforte-action, the vibrating jack-lever *F*, having arms *F'* and *h*, said lever *F* pivoted to the actuating-bar *B* and having 105 regulating-screw *g*, and springs acting against the said jack-lever, in the manner shown and to produce the results specified.

2. In a pianoforte-action, the vibrating disk *E*, pivoted to the hammer-butt *C*, in the manner and for the purposes specified. 110

3. In a pianoforte-action, the vibrating disk *E*, combined with the jack-lever *F*, in the manner and for the purpose specified.

4. In a pianoforte-action, the vibrating disk 115 *E*, combined with the actuating-bar *B* by means of the jack-lever *F*, in the manner and for the purpose specified.

5. In a pianoforte-action, the metal strap *k*, so formed as to fit an extended portion of the 120 hammer-butt *C*, passing below its pivot, said portion suitably curved and the strap *k* secured thereto, in the manner and for the purposes specified.

6. In a pianoforte-action, the hammer-butt 125 *C*, having an extended part below its pivot and flange-support suitably routed to receive the vibrating disk *E* and its packing *e'*, in the manner and for the purpose named.

7. In a pianoforte-action, the hammer butt 130 *C*, having a part extended below its pivot suitably curved and shaped to form a bearing to receive the buffer of the jack-lever *F* or such check-damper as its equivalent thereto,

the said hammer-butt being routed to receive the vibrating disk E and packed in said routing, and the metal strap *k*, formed to fit the said extended portion of the hammer-butt and rest upon and against its pivot, the same being secured by means of a screw on both sides of said pivot, for the purpose described.

8. In a pianoforte-action, a jack-lever F, pivoted to the actuating-bar B and having arms F' and *h*, and a spring or springs operating against said jack-lever, a regulating-screw in arm F' and pivoted to the vibrating disk E, said disk E, pivoted to the hammer-butt C, in the manner and for the purposes described.

9. In a pianoforte-action, the vibrating jack-lever F, pivoted to the actuating-bar B, having arms F' and *h* and reacting springs, in combination with the strip *i'* and buffer *i*, for the purpose specified.

purpose specified.

10. In a pianoforte-action, the longitudinal strip or bar M, formed with a groove, said groove cut in cross-sections at suitable spaces to correspond with the keys and packed with cloth or other materials, said groove and cross-sections to receive the wire loops N at their right-angle bends, the said loops secured to the split pitman by their other ends, the strip or bar M, secured to the action-rail L, all in the manner and for the purposes specified.

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Witnesses:

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