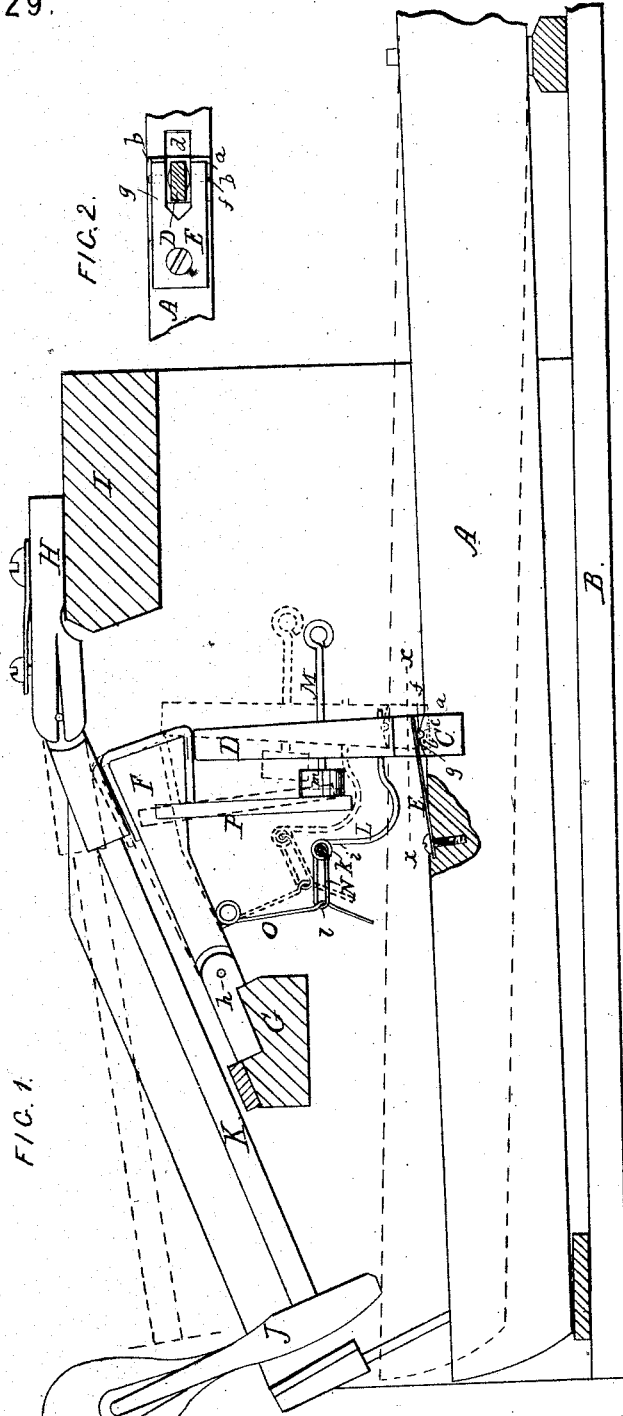


A. K. HEBARD.  
Pianoforte Action.

No. 161,229.

Patented March 23, 1875.



WITNESSES.

*Saint Despres*  
*W. F. Dismore.*

INVENTOR.

*A. K. Hebard*  
*Per Brown Brothers*  
*Attorneys*

# UNITED STATES PATENT OFFICE.

ALBERT K. HEBARD, OF CAMBRIDGE, MASSACHUSETTS.

## IMPROVEMENT IN PIANO-FORTE ACTIONS.

Specification forming part of Letters Patent No. **161,229**, dated March 23, 1875; application filed August 22, 1874.

*To all whom it may concern:*

Be it known that I, ALBERT K. HEBARD, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented Improvements in Piano-Forte Actions, of which the following is a specification:

The object of this invention is to produce an action for piano-fortes that will be simple, cheap, sensitive, delicate in touch, repeat with ease and rapidity, powerful, not liable to get out of order, convenient in regulating, easily adjusted, and durable; and it consists of the jack-fly being pivoted to the key in a manner to be hereinafter more fully described; the fly, by its button, resting against a downwardly-projecting arm from the under hammer.

A wire, secured to the lower back part of the fly, extends back and upward, ending in a bushed eye, on a line horizontal, or nearly so, to the regulating-screw of the jack-fly. A spring, fastened at one end to the under part of under hammer, near its pivot, extends downward, and bears in a link in the bushed eye of the wire. The hammer-stem is hinged in the flange, according to an invention for which Letters Patent were issued to me, dated December 9, 1873, and numbered 145,417. The pivot of the jack-fly is held in its seat by a spring bearing upon it, which will be more particularly described hereinafter.

In the accompanying plate of drawings my invention is illustrated, Figure 1 being a side view of a piano-forte action on one key with the action at rest, and in dotted lines showing the position of the principal parts after a blow has been struck and the hammer caught on the back catch; Fig. 2, a horizontal cross-section of jack-fly in plane of line *x x*, Fig. 1.

A, in the drawings, represents a portion of a key of a piano-forte action, adapted in the usual manner for its proper movements upon the frame B. C, a block of hard wood, securely inserted in the key A at *a*. This block C is cut away in its central upper portion, in line with the key A, forming two uprights, *b*, on the top of which is a bearing, *c*. The key is slotted at *d*, front of the open part of block C, and between the uprights, to afford room for the movement of the jack-fly D. This jack-fly D, by its pin *f*, rests and swings in the

bearing *c* in block C. A flat spring, E, secured to key back of the jack-fly D, bears, by its forked end *g*, upon each end of the pin *f* projecting from the jack-fly D, holding it, and thus the jack-fly, with sufficient firmness in its seat, and yet allow for its proper movements, and of the removal and insertion of the jack-fly at pleasure, the key being cut away at *d* for the purpose. The spring E holding the pivot firmly in its seat obviates the necessity of bushing the bearing, as at present; F, the under hammer, secured to and swinging in its bearing *h* on rail G; H, the flange on the flange-rail I; J, the hammer; and K, its stem. A wire, L, is secured by screw-thread to the back of the jack-fly D near its lower part. This wire L is bent upward, and has in its end *i* the eye *k*, which is bushed with cloth. The position of the eye *k* is arranged to be on, or about, in a line horizontally with the regulating-screw M of the jack-fly. A link, N, is hung in the eye *k* of wire L. From the under part of the under hammer F, near its pivot, is secured the spring O, which extends downward and engages, by a bend, *l*, in the link N. P, an arm, rigidly fixed in and extending downward from the under hammer in a line parallel, or nearly so, to the jack-fly, against which arm P the button *m* on end of regulating-screw M on jack-fly bears.

The operation of the action is as follows: Pressing the front end of the key A down raises the back end, and, through the jack-fly D and under hammer F, the hammer is caused to strike the string of the piano-forte, when, rebounding, the key being held down, it is caught by the back catch, the position of the parts being then as shown in dotted lines, Fig. 1, the under hammer relieved from the jack-fly. Now, slowly allowing the front end of the key to rise, by the spring O in under hammer, through link N and wire L, the jack-fly D is gradually forced into its position under the end of under hammer, the spring also serving to keep the under hammer up, whereby a second blow can be given before the key reaches its resting-place.

The advantages of the present invention are obvious: The several parts of the action are so constructed and arranged that they can all be made in duplicate, thereby requiring

but little adjustment and regulation by the finisher; a further advantage is in the peculiar construction of the flange-joint of the hammer-stem and the pivoting of the jack-fly, whereby either one or both can be easily removed from and replaced in position when desired without injury or alteration of their relative positions with the other parts of the action; another advantage is in the sensitiveness of the touch, the hammer by its stem, when the action is properly adjusted, resting directly and entirely, through under hammer and jack-fly, upon the key, and as the joints of the hammer-stem and jack-fly are not bushed, it is still more sensitive, and the action obviously more powerful, repeating blows with ease and rapidity are insured by the spring O which keeps the under hammer up for the jack-fly to pass under again after being relieved, and also forces the jack-fly into its position, ready for another blow, before the key has reached its seat. The downward-extending arm of the under hammer by its forward-swinging movement when in operation insures the relieving of the jack-fly at the proper time, and also prevents blocking. The line of action of the spring O and link N in its pull upon the jack-fly at the time when the jack-fly is relieved, as shown in dotted lines, Fig. 1, increases the

certainty of the jack-fly returning to its place under the under hammer for the second blow in repeating.

Having thus fully described my invention, what I claim is—

1. The pivoted under hammer F, having the downwardly-projecting arm P, in combination with the regulating-screw M, its button *m* and the jack-fly D, the whole being arranged to operate as described, whereby the jack-fly is released at the proper time, as herein set forth.

2. In a piano-forte action, the fly of a jack, having wire L and link N, in combination with the under hammer F, with spring O, all arranged for operation substantially as described, for the purpose specified.

3. The spring E, in combination with the pivot of the fly of a jack, substantially as described, for the purpose specified.

4. In combination with an under hammer, F, having the arm P and spring O, the fly of a jack, having wire L and link N, all arranged for operation substantially as described, for the purpose specified.

The above specification of my invention signed by me this 18th day of May, A. D. 1874.

Witnesses: ALBERT K. HEBARD.

EDWIN W. BROWN,

GEO. H. EARL.