

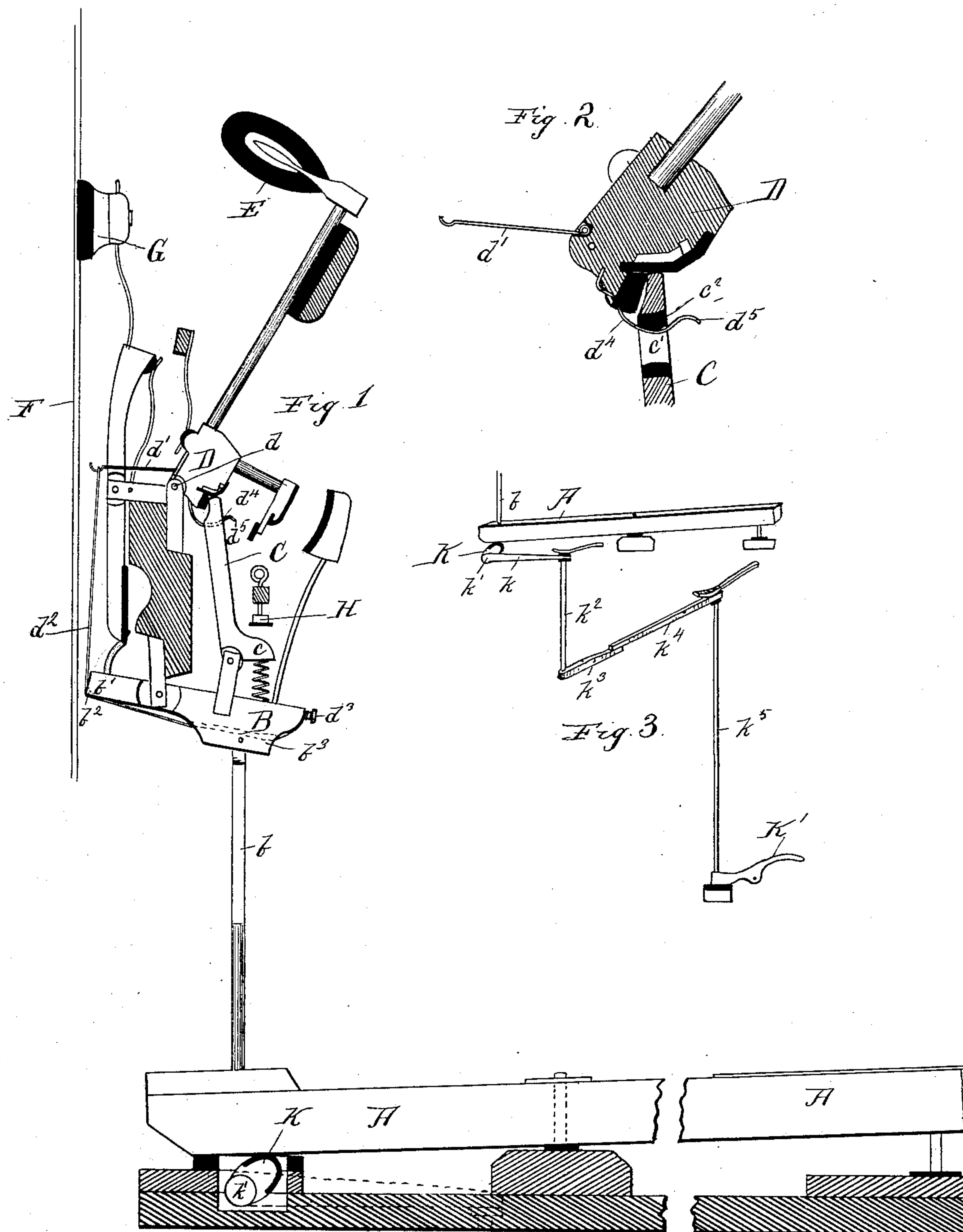
(No Model.)

S. HARCOURT.

PIANO ACTION.

No. 376,477.

Patented Jan. 17, 1888.



Witnesses:
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UNITED STATES PATENT OFFICE.

STILLWELL HARCOURT, OF CHICAGO, ILLINOIS, ASSIGNOR TO HIMSELF
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PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 376,477, dated January 17, 1888.

Application filed September 26, 1887. Serial No. 250,652. (No model.)

To all whom it may concern:

Be it known that I, STILLWELL HARCOURT, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Piano-Forte Actions, of which the following is a specification.

My invention relates to actions for upright pianos, and more particularly to repeating-actions, or means whereby the stroke of the hammer may be rapidly repeated by partial or slight movements of the key.

My invention consists, in connection with the hammer, hammer-butt, jack, and the lever for raising or operating the jack, of a light spring secured to the hammer-butt projecting to the opposite side of its pivot from the jack, and connected by a cord or link with the inner end of the lever which raises the jack, combined with an upwardly-curved or hook-shaped guide or cam which projects through a slot in the jack and serves to instantly return the jack to place under the hammer butt after each impulse.

In the accompanying drawings, which form a part of this specification, and in which similar letters of reference indicate like parts, Fig. 1 is a section of my improved piano-action. Fig. 2 is an enlarged section of the hammer-butt, and Fig. 3 is a small perspective view of the soft-pedal connections.

In said drawings, A represents the key; B, the jack-operating lever; *b*, the link or connection between said lever and the key; C, the jack; D, the hammer-butt; E, the hammer; F, the string; G, the damper, and H the stop against which the toe *c* of the jack impinges. All these parts are of the ordinary and well-known construction.

The hammer-butt D is pivoted at *d* and furnished with a light spring, *d'*, which projects to the opposite side of the hammer-butt pivot from the jack C. This spring *d'* is connected to the end *b'* of the jack-lever by a string or other suitable connection, *d''*. The length of this connection *d''* is preferably made adjustable, and, for convenience of adjustment, I provide the end *b'* of the jack-lever with a slot or notch, *b''*, and lead the string along the under side of the jack-lever B through an opening, *b'''*, therein to the front end thereof, where

the adjusting screw *d'''* is located, so as to be conveniently accessible from the front of the piano. The string or connection *d''* is secured to the adjusting-screw, and may be lengthened or shortened by simply turning the screw, and thus winding or unwinding the string therefrom. The hammer-butt D is further provided with an upwardly-curved guard or cam, *d⁴*, which is secured to the lower end of the hammer-butt and projects through a central slot, *c'*, cut in the upper end of the jack C. The outer end of this curved or hook-shaped cam or guard is recurved or bent slightly downward, as shown at *d⁵*, to permit the slotted jack to move backward to its full and ordinary limit. The upper wall or margin, *c''*, of the slot *c'* in the jack is made downwardly inclined toward the hammer-butt, to correspond somewhat to the inclination of the outer portion of the curved guide *d⁴*, so that the slotted jack will move readily and freely on the guide or cam *d⁴*. The curved guide *d⁴* is preferably made of round wire, and the size of the wire may be such, if desired, as to give a slight spring movement to the curved guide. The spring *d'*, connected with the end of the jack-lever, serves to begin the movement of the hammer or hammer-jack by the slightest movement of the key, as well as to partially arrest the rebound of the hammer, and thus aids the curved guide *d⁴* in returning the jack to place after each impulse. The shape of the curved guide is such, as shown in the drawings, as to offer no obstruction to the free clearance of the jack from the hammer-butt after each impulse or stroke, so that the hammer may quickly and properly rebound from the string.

To prevent any lost motion in the keys, I provide an adjustable or eccentrically-mounted cushion, K, upon which the inner ends of the keys rest. This movable or eccentric soft-pedal cushion extends the full length of the key-board under each of the keys, and is connected to the foot-pedal K' through an arm, *k*, secured to the shaft *k'* of the eccentric cushion K, link *k²*, lever *k³*, lever *k⁴*, and link *k⁵*.

I claim—

1. The combination, in a piano-forte action, of the hammer, hammer-butt, jack, and jack-operating lever with a spring secured to the hammer-butt and projecting to the opposite

side of its pivot from the jack, and connected by a cord or link with the inner end of the jack-lever, said hammer-butt being also provided at its lower end with a curved guard or
 5 guide projecting through a slot in the upper end of the jack for returning the jack to position under the hammer-butt, substantially as specified.

2. The combination, in a piano-forte action,
 10 of the hammer, hammer-butt, jack, and jack-operating lever with a spring secured to the hammer-butt and projecting to the opposite side of its pivot from the jack, and connected by a cord or link with the inner end of the
 15 jack-lever, said hammer-butt being also provided at its lower end with a curved guard or guide projecting through a slot in the upper end of the jack for returning the jack to position under the hammer-butt, the outer end of
 20 said curved guard being recurved, substantially as specified.

3. The combination, in a piano-forte action, of the hammer, hammer-butt, jack, and jack-operating lever with a spring secured to the
 25 hammer-butt and projecting to the opposite side of its pivot from the jack, and connected by a cord or link with the inner end of the jack-lever, said hammer-butt being also provided at its lower end with a curved guard or
 30 guide projecting through a slot in the upper end of the jack for returning the jack to position under the hammer-butt, the outer end of said curved guard being recurved, and the upper wall or edge of said slot being down-

wardly inclined toward the hammer-butt, substantially as specified. 35

4. The combination, with hammer E, of hammer-butt D, provided with a curved cam or guide, d^t , for the jack, provided with a re-curved end, d , jack C, furnished with slot c' ,
 40 through which said curved guard projects, and lever B, for raising the jack, substantially as specified.

5. The combination, with hammer E, of hammer-butt D, provided with spring d' , jack C,
 45 jack-lever B, and link or cord d^2 , said spring d' projecting to the opposite side of the hammer-butt pivot from the jack and being connected by said link or cord with the inner end, b' , of the jack-lever, and an adjusting-screw, d^3 ,
 50 at the front end of the jack lever, said cord extending along the jack from its rear end to its front end and wound around said adjusting-screw, substantially as specified.

6. The combination, with hammer E, of hammer-butt D, provided with spring d' , jack C,
 55 jack-lever B, and link or cord d^2 , said spring d' projecting to the opposite side of the hammer-butt pivot from the jack and being connected by said link or cord with the inner end, b' , of the jack-lever, and an upwardly-curved or hook-shaped cam or guide, d^t , projecting
 60 through the slot c' in the jack C, substantially as specified.

STILLWELL HARCOURT.

Witnesses:

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