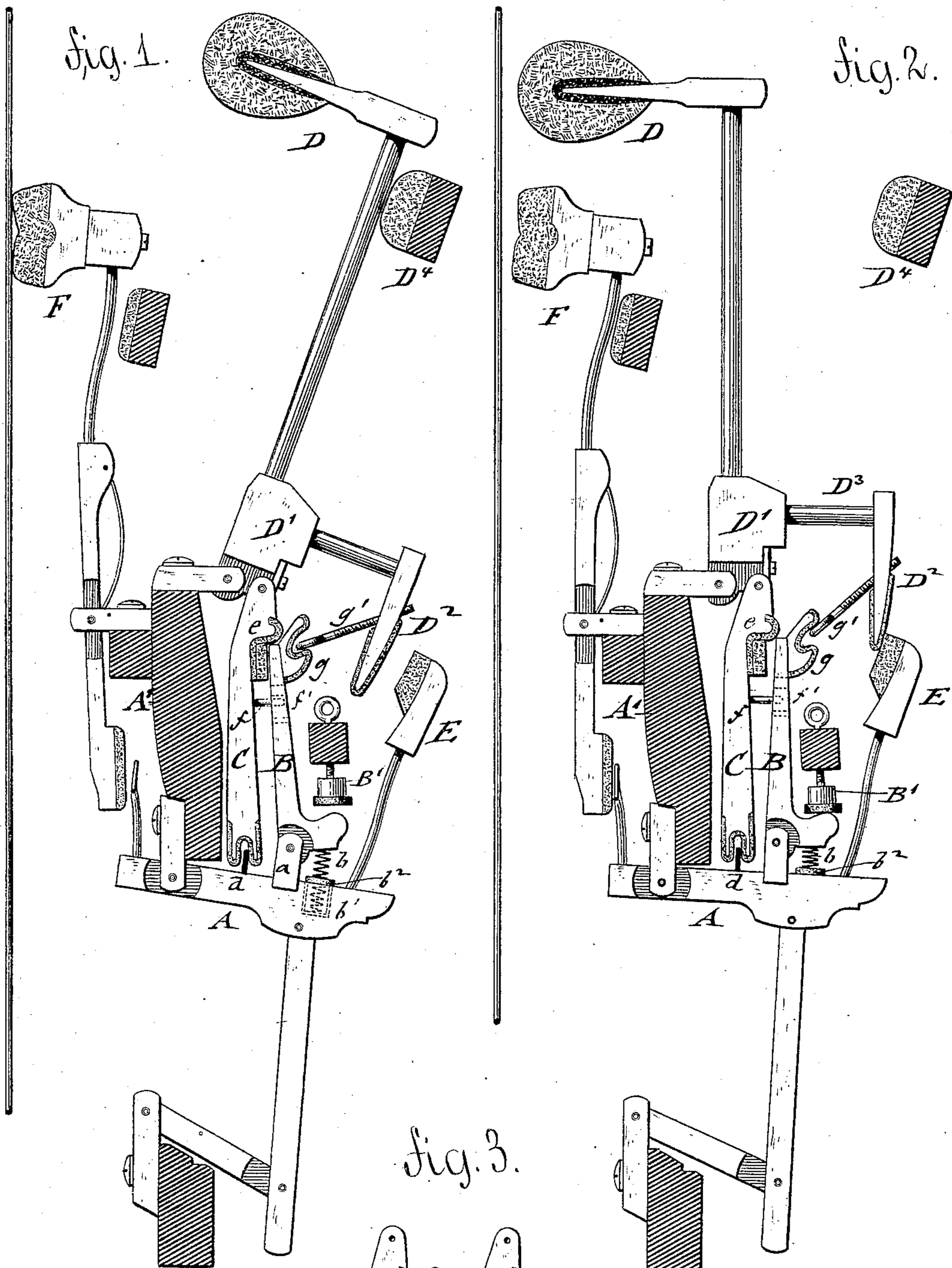


(No Model.)

F. L. BECKER.
UPRIGHT PIANO ACTION.

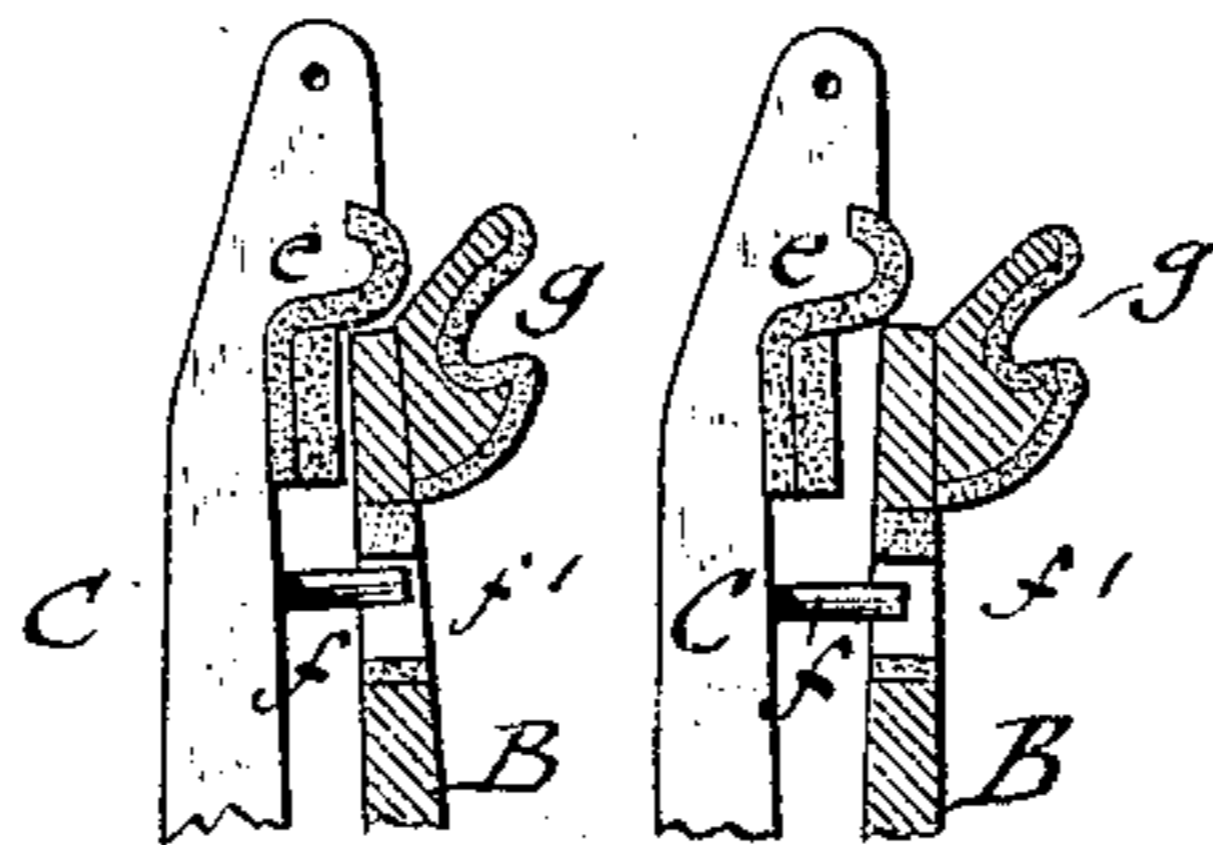
No. 304,777.

Patented Sept. 9, 1884.



WITNESSES:

Fre. W. Rosenbaum.
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UNITED STATES PATENT OFFICE.

FRANCIS L. BECKER, OF NEW YORK, N. Y.

UPRIGHT-PIANO ACTION.

SPECIFICATION forming part of Letters Patent No. 304,777, dated September 9, 1884.

Application filed January 17, 1884. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS L. BECKER, of the city, county, and State of New York, have invented certain new and useful Improvements in Upright-Piano Actions, of which the following is a specification.

This invention has reference to improvements in upright-piano actions, by which the construction is simplified and great facility of repetition obtained.

The invention consists of a jack-actuating lever provided with a fixed lug, on which rests the forked lower end of a push-piece that is pivoted to the hammer butt, and provided below the pivot with a leather-covered shoulder for the lifting-jack. A fixed pin below said shoulder engages a slot of the jack, which thereby acts on the push-piece in the nature of a bridle. The jack is provided at its upper end with a C-shaped rest-piece, which engages the screw-eye of a downwardly-extending arm that is attached by a shank to the hammer-butt, said arm being extended below the level of the pivot of the hammer-butt, and also engaged by the back-check supported on the jack-operating lever.

In the accompanying drawings, Figures 1 and 2 represent side elevations of my improved upright-piano action, showing the same respectively in a position of rest and in the act of striking, and Fig. 3 is a sectional detail showing the connection of the jack with the push-piece that extends from the jack-actuating lever to the hammer-butt.

Similar letters of reference indicate corresponding parts.

Referring to the drawings, A represents the jack-actuating lever, which is fulcrumed, in the usual manner, to the transverse main bar A' of the action-frame, and actuated by the key-lever and intermediate mechanism in the usual manner.

To the bearings *a* of the jack-actuating lever A is fulcrumed, in the usual manner, the lifting-jack B, the lower arm of which is acted upon by a spiral spring, *b*, that is seated in a socket, *b'*, of the lever A, (shown in dotted lines in Fig. 1,) said socket being provided with a flannel bushing, *b''*. By thus arranging the spring in a socket, instead of gluing

the same, as heretofore, the same can not only be more easily replaced in case it becomes dull by use, but it also admits the arranging of the jack B closer to the lever A.

Back of the jack B is arranged a push-piece, C, which rests by its forked lower end on a fixed transverse lug, *d*, of the jack-operating lever A, upon which lug the push-piece C oscillates. The upper end of the push-piece C is pivoted to the butt D' of the hammer D. The push-piece C is provided below the pivot with a cushioned shoulder, *e*, against which the upper end of the jack B abuts when it is in a position of rest. The push-piece C is further provided below the shoulder *e* with a fixed pin, *f*, that extends into a slot, *f'*, of the jack B, said slot being arranged with cushions at both ends, so as to reduce as much as possible the jar of the pin *f*. The jack B is stopped, in the usual manner, by an adjustable check, B', which throws the jack away from the shoulder *e* of the push-piece C when the hammer-butt has been lifted. The upper end of the jack B is provided at its front side with a cloth-covered C-shaped rest-piece, *g*, which forms contact with a screw-eye, *g'*, that is secured to an arm, D², of the hammer-butt D'. The arm D² is connected to a shank, D³, of the hammer-butt, and extended downwardly far enough so that the end of the arm D² is below the level of the pivot of the hammer-butt. The arm D² is also engaged by the back-check E, which is attached to the jack-operating lever A, the back-check E exerting a downward instead of an upward pressure upon the somewhat elastic end of the arm D², when the hammer is moved backward against the string. The hammer D drops back, when the action is released, against a hammer-rest, D⁴.

The damper F is constructed and operated in the usual manner by the jack-operating lever, and forms no part of this invention.

The operation of my improved action is as follows: When the key is depressed, the jack-operating lever A is raised, so that the jack acts upon the shoulder of the push-piece C and moves nearly parallel with the same in an upward direction until the lower arm of the jack strikes the check-cushion B', whereby a let-off

motion is imparted to the upper end of the jack, and thereby the same released from the push-piece C. By the upward motion of the jack and push-piece C the hammer-butt is
 5 lifted, and the hammer is thrown with considerable velocity against the string. As soon as the upper end of the jack recedes from the shoulder of the push-piece C, the C-shaped rest-piece *g* strikes against the screw-eye *g'*
 10 and aids in throwing the hammer back after the same has reached the string, so as to prevent the blocking of the same. The push-piece C oscillates freely on the fixed lug *d* of the jack-operating lever A, and forms a direct
 15 and positive connection with the hammer-butt D'. The weight of the push-piece C, added to that of the jack, influences the drop-motion of the hammer, and assists thereby in the rebound of the hammer, dispensing thereby with the
 20 spring that has heretofore been applied to the back of the hammer-butt, which spring exerts a constant resistance and lessens to that extent the force of the stroke. The direct action of the push-piece upon the hammer, in connection with the lifting action of the jack and the
 25 sudden release of the same, throws the hammer with accelerated velocity and force against the string. As the jack is connected with the push-piece C by its slot *f'* and the pin *f* of the
 30 push-piece, it exerts a downward motion upon the push-piece as soon as the upper end of the jack is returned into position below the shoulder of the push-piece by the screw-eye *g'* of the arm D of the hammer-butt. This construction forms an essential feature of my improved
 35 action, as it does away with the unreliable action of the bridle and bridle-wires that were heretofore in use in nearly all upright-piano actions. Another important feature is the
 40 clamping action that is exerted by the C-shaped rest-piece of the jack and the back-check upon the downwardly-extending arm D² and its screw-eye *g'*. Their joint action clamps the hammer firmly when in vertical
 45 position and enables the jack to drop below the shoulder of the push-piece C before the hammer reaches its rest-cushion, so as to enable thereby quick repetition. As the jack is thus operated by the screw-eye, the jack-spring would not be absolutely necessary, and
 50 might be dispensed with, though it is preferable to retain the same, so as to gain the required quickness of action for repetition. The length of the back-check is reduced,
 55 whereby its power of resistance against the rebounding motion of the hammer is increased.

The advantages of my improved action are that it is of simple and durable construction, that it can be readily set up and regulated,
 60 and that a great facility of repetition is obtained.

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

1. In an upright-piano action, the combi-

nation of the jack-operating lever having a 65 transverse lug, a push-piece resting on said lug, a jack pivoted to said lever, a hammer the butt of which is pivoted to the upper end of the push-piece, said push-piece being provided with a shoulder for the jack and
 70 with means connecting it with the jack, whereby the jack exerts a downward motion on the push-piece, substantially as set forth.

2. The combination of the jack-operating lever A, jack B, having a slotted upper end, 75 push-piece C, having a shoulder, *e*, and a pin, *f*, extending into the slot of the jack, and hammer-butt D', pivoted to the upper end of the push-piece, substantially as described.

3. The combination of the jack-operating 80 lever A, having a fixed transverse lug, *d*, jack B, having a slotted upper end, push-piece C, having a forked lower end, hammer-butt D', pivoted to the push-piece, said push-piece having a shoulder, *e*, below the pivot, and a 85 fixed pin, *f*, below the shoulder engaging the slot of the jack, substantially as set forth.

4. The combination of the jack-operating lever A, jack B, having a C-shaped rest-piece, *g*, at its upper end, push-piece C, hammer- 90 butt D', pivoted to the push-piece C, and having an arm, D², extending below the pivot of the hammer-butt, and a screw-eye, *g'*, secured to the arm D² and extending toward the rest-piece *g*, substantially as set forth. 95

5. The combination of the jack-operating lever A, jack B, provided at its upper end with a C-shaped rest-piece, push-piece C, hammer-butt D', having a downwardly-extending arm, D², screw-eye *g'*, secured to the 100 arm D², and back-check E, substantially as set forth.

6. The combination of the jack-operating lever A, fulcrumed jack B, provided with a slot, *f'*, and a C-shaped rest-piece, *g*, push- 105 piece C, having a shoulder, *e*, and pin *f*, hammer-butt D', pivoted to the push-piece, and provided with a downwardly-extending arm, D², a screw-eye, *g'*, attached to the arm D², and back-check E, all substantially as set 110 forth.

7. The combination of the jack-operating lever A, having a back-check, E, fulcrumed jack B, having C-shaped rest-piece *g* at its 115 upper end, hammer-butt D', provided with a downwardly-extending arm, D², having a screw-eye, *g'*, the hammer being held in nearly vertical position by the clamping action of the rest-piece and back-check upon the screw-eye and the arm of the hammer-butt, substan- 120 tially as specified.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

FRANCIS L. BECKER.

Witnesses:

PAUL GOEPEL,
 SIDNEY MANN.