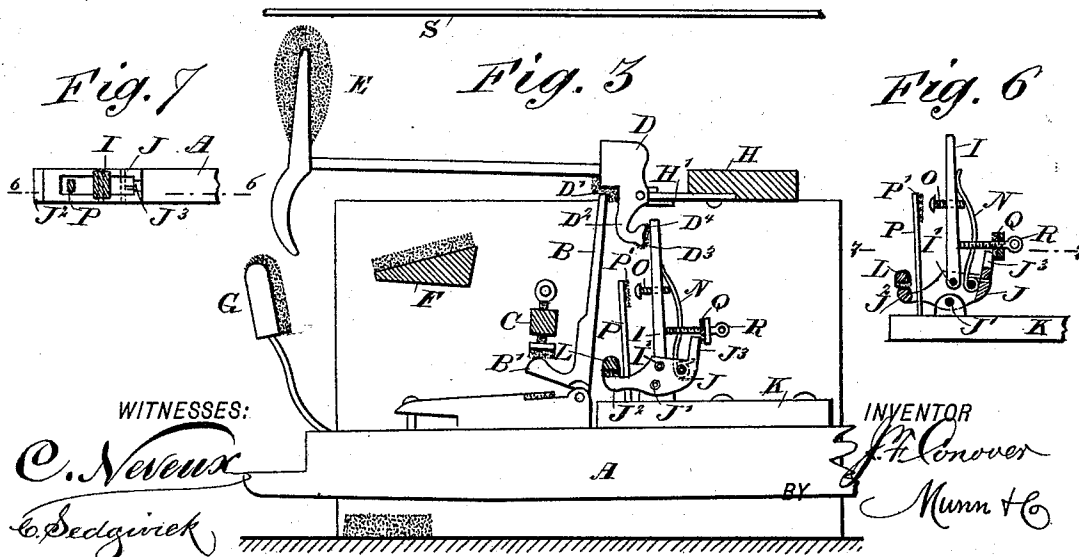
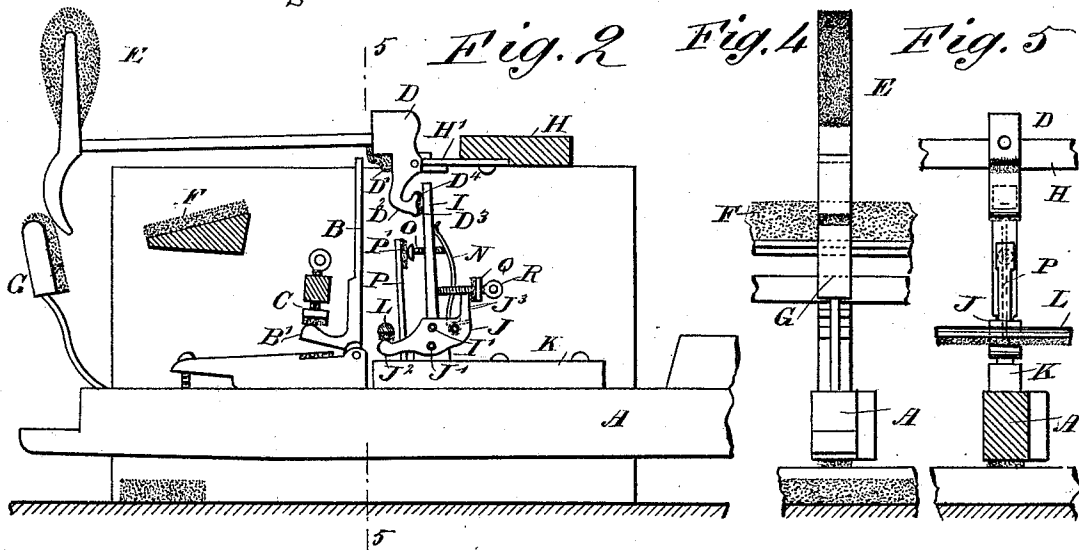
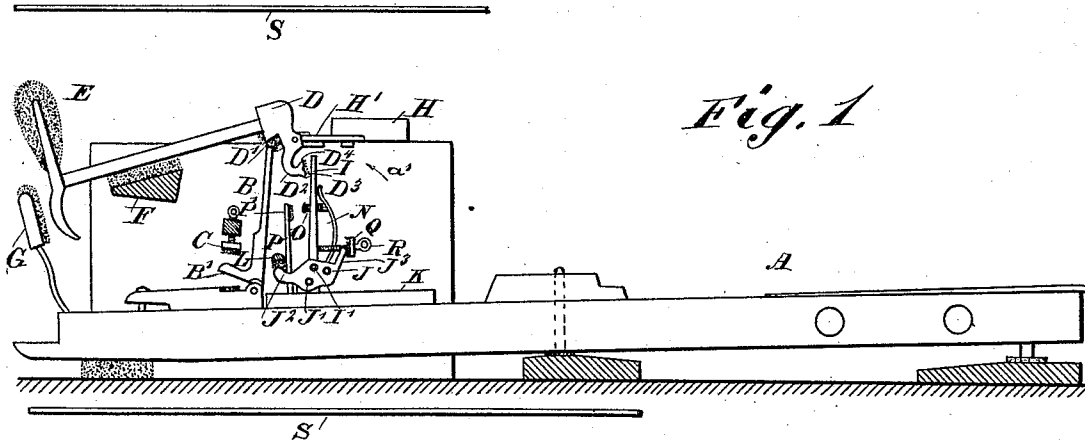


J. F. CONOVER.
PIANO ACTION.

Patented Nov. 14, 1893.



WITNESSES:

INVENTOR

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JAMES F. CONOVER, OF NEW YORK, N. Y.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 508,813, dated November 14, 1893.

Application filed January 6, 1893. Serial No. 457,468. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. CONOVER, of New York, in the county and State of New York, have invented certain new and useful Improvements in Piano-Actions, of which the following is a full, clear, and exact description.

The object of the invention is to provide certain new and useful improvements in piano actions, whereby the hammer can be forcibly propelled to the string from intermediate points of its travel, for conveniently and rapidly executing reiterating tone passages, without the necessity of the action resuming its normal position after each percussion, so as to form a double repeating or grand action, and insuring greater speed and force of the hammer, so as to increase the purity and quantity of the tone of the instrument.

The invention consists of a rocker pivoted on the key and provided with a spring-pressed pivoted arm adapted to engage the pivot end of the hammer.

The invention also consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is an enlarged sectional side elevation of the same in a different position. Fig. 3 is a similar view of the same in still another position. Fig. 4 is an end view of the same. Fig. 5 is a transverse section of the same on the line 5—5 of Fig. 2. Fig. 6 is a sectional side elevation of the rocker and adjacent parts, the section being taken on the line 6—6 of Fig. 7; and Fig. 7 is a sectional plan view of the same on the line 7—7 of Fig. 6.

The improved piano action is provided with the usual key A, on which is pivoted the jack B having the usual foot B' adapted to be engaged by the usual regulating stop C at the time the key is pressed. The upper free end of the jack B is adapted to engage a cushioned notch D' formed on the butt or pivot end D of the hammer E, the shank of which is adapted to rest, when in its normal posi-

tion, on the usual cushioned hammer rail F, as is plainly shown in Fig. 1. The hammer is also adapted to be seated at its lower end on the back catch G secured on the key A.

The butt or pivot end D of the hammer is pivoted on the usual butt flange H' secured to the action rail H, as is plainly shown in the drawings. On the butt or pivot end D is formed a downwardly extending tail D² formed with two offsets D³ and D⁴, both being cushioned and adapted to be engaged by the free end of an arm I pivoted at its lower end, at I', in a hollow rocker J pivoted at J' on a base block K, secured to the top of the key A in front of the jack B, as is plainly shown in the drawings.

The rocker J is formed with a projection J² adapted to engage a cushioned, stationary stop L, and on the said rocker is also secured a spring N, pressing with its free end against the front side of the pivoted arm I, so as to move the latter with its free end in contact with the offsets D³ and D⁴ of the tail D². A screw O screws in the pivoted arm I and is adapted to engage the inside of the free end of the spring N, while the head of the said screw is adapted to be seated on the cushion P' of a rod or elbow P, secured on the base block K and extending through the hollow rocker J, between the pivot J' of the latter and the cushioned, stationary stop L. On the front end of the rocker J is formed an upwardly extending projection or flange J³ adapted to abut against the face of a stop Q held on a screw R screwing in the arm I between the pivot I' of the latter and the screw O, as is plainly shown in Figs. 1, 2 and 3.

The operation is as follows: When the outer end of the key A is quickly forced down or struck by the finger, the jack B throws the hammer E to the string S in the usual manner, and at the same time the projection D³ is moved away from the pivoted arm I and the projection J² of the rocker J is moved in contact with the cushioned, stationary stop L, so that the rocker is caused to turn on its pivot J', thereby carrying the top of the arm I rearward in the direction of the arrow a', the said arm traveling with its free end on the projections D³ and D⁴. As the base block K is secured to the key, the upper, cushioned end P' of the fixed rod P is carried in the op-

posite direction to the arrow a' and comes in contact with the head of the screw O, as is plainly indicated in Fig. 2. At this stage the action would become rigid and useless were it not that the pivoted arm I and the rocker J are pivotally connected with each other, so that when the movement of the key A continues the top of the arm I is forced slightly in the inverse direction of the arrow a' by the action of the fixed rod P engaging and pressing on the screw O secured in the said arm I. The rocker J, on continuing to turn on its pivot, carries the pivoted end of the arm I rearward in the direction of the arrow a' , and at the same time the arm I turns with the cushion P' as the fulcrum, which causes the top to be thrown far enough back to allow the upper projection D⁴ of the tail D² to fall back in contact with the said arm I, after the upper end of the jack B has been freed from the notch D' of the pivot end D of the hammer, it being understood that at this time the foot B' of the jack comes in contact with its regulating stop C. The hammer now falls back upon the back catch G, as is plainly illustrated in Fig. 2. The reverse movement of the arm I and rocker J releases the stop Q from the projection J³, and at the same time forces the spring N forward into a more compressed state. The outer end of the key A is now down, and the point of contact of the upper projection D⁴ of the pivot end D and the arm I is in the rear of a plane passing through the axis of the pivot of the butt D, and the pivot I' of the arm I, so that the several parts assume the position shown in Fig. 2. It is understood that the projections D³ and D⁴ of the tail D² are preferably made in a pronged or fish tail shape, so located that when the action is in a normal position, as illustrated in Fig. 1, the lower projection D³ will be in slight contact with the arm I, and when the hammer is thrown to the string S the upper projection D⁴ will swing downward and fill a space which would otherwise exist when the hammer has recoiled upon its back catch G. Now, by reference to Fig. 2 it will be seen that if it were not for the spring N pressing against the arm I with sufficient force to hold the hammer up, it would, when released by the back catch G, fall upon the cushioned rail F and compel the key to resume the normal position before the jack B could return with its free end into the cushioned notch D' of the butt D. With my improvement, however, it is different, as the instant the outer end of the key rises the rod P recedes from the lever I and permits it to swing in the direction of the arrow a' , thus giving the spring N control of the hammer E the instant the latter is released from the back catch G. The spring N now presses the arm I against the upper projection D⁴, thus raising the hammer by turning the butt D on its pivot on the flange H a sufficient distance to allow the free end of the jack B to return into the notch D' before the spring N is checked in its move-

ment at the proper time by the regulating stop Q coming in contact with the projection J³ of the rocker J. The normal relative position of the parts having thus been restored with the hammer in close proximity to the string S, it can be again propelled to the string at will, from any intervening point in its descent, without the shank of the hammer coming in contact with the cushioned hammer rail F. At the time the spring N is given control of the hammer by pressing on the arm I, as before described, the point of contact of the said arm and the projection D⁴ is out of line with a plane passing through the axis of the pivot of the butt D and the pivot I' of the arm I, as is plainly shown in Fig. 2, but while the spring N is forcing the movements of the parts, there is a slight descent of the action and an upward movement of the hammer, just enough to bring this point of contact within the said plane the instant the stop Q comes in play as before mentioned, which gives the required distance to permit the jack B to simultaneously enter the notch D' of the butt D. In the grand actions as now in use this simultaneous adjustment is not found, as the automatic mechanism comes to a stop before the jack regains its position, thus requiring a further movement of the key to complete the adjustment, which retards the repetition and destroys the precision of the touch. It will be seen that by this movement greater speed and force can be given to the hammer so as to increase the purity and quantity of the tone. The automatic adjustment is instantaneous and cannot be affected by repeated strokes of the key. The latter responds to a very light and quick touch with fluency and precision, and thus equips the pianist with greater resources for musical effect.

The action is very durable and economical, owing to its form and simplicity of construction and easy method of adjustment.

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

1. A piano action provided with a rocker adapted to be pivoted to the key, and a spring-pressed arm pivoted on the rocker and adapted to engage the pivot end of the hammer, substantially as shown and described.

2. A piano action provided with a rocker pivoted to the key, a spring-pressed arm pivoted on the said rocker, and a fixed rod held on the key and adapted to engage the said arm, substantially as shown and described.

3. A piano action provided with a hammer having a pivot end formed with a tail having two offsets, substantially as shown and described.

4. A piano action comprising a hammer formed with a notch adapted to be engaged by the jack, the pivot end of the said hammer being formed with a tail having two projections, a rocker pivoted on the key, and a spring-pressed arm pivoted on the said rocker and adapted to engage with its free end the

projections on the tail of the hammer, substantially as shown and described.

5 5. A piano action comprising a hammer formed with a notch adapted to be engaged by the jack, the pivot end of the said hammer being formed with a tail having two projections, a rocker pivoted on the key, a spring-pressed arm pivoted on the said rocker and adapted to engage with its free end the projections on the tail of the hammer, and a regulating stop held on the said pivoted arm and adapted to engage a projection on the said rocker, substantially as shown and described.

15 6. A piano action comprising a hammer

formed with a notch adapted to be engaged by the jack, the pivot end of the said hammer being formed with a tail having two projections, a rocker pivoted on the key, a spring-pressed arm pivoted on the said rocker and adapted to engage with its free end the projections on the tail of the hammer, a screw screwing in the said arm and adapted to engage the spring for the same, and a rod fixed to the key and adapted to engage the said screw, substantially as shown and described.

JAMES F. CONOVER.

Witnesses:

JAMES SMITH,

GEORGE H. CONOVER.