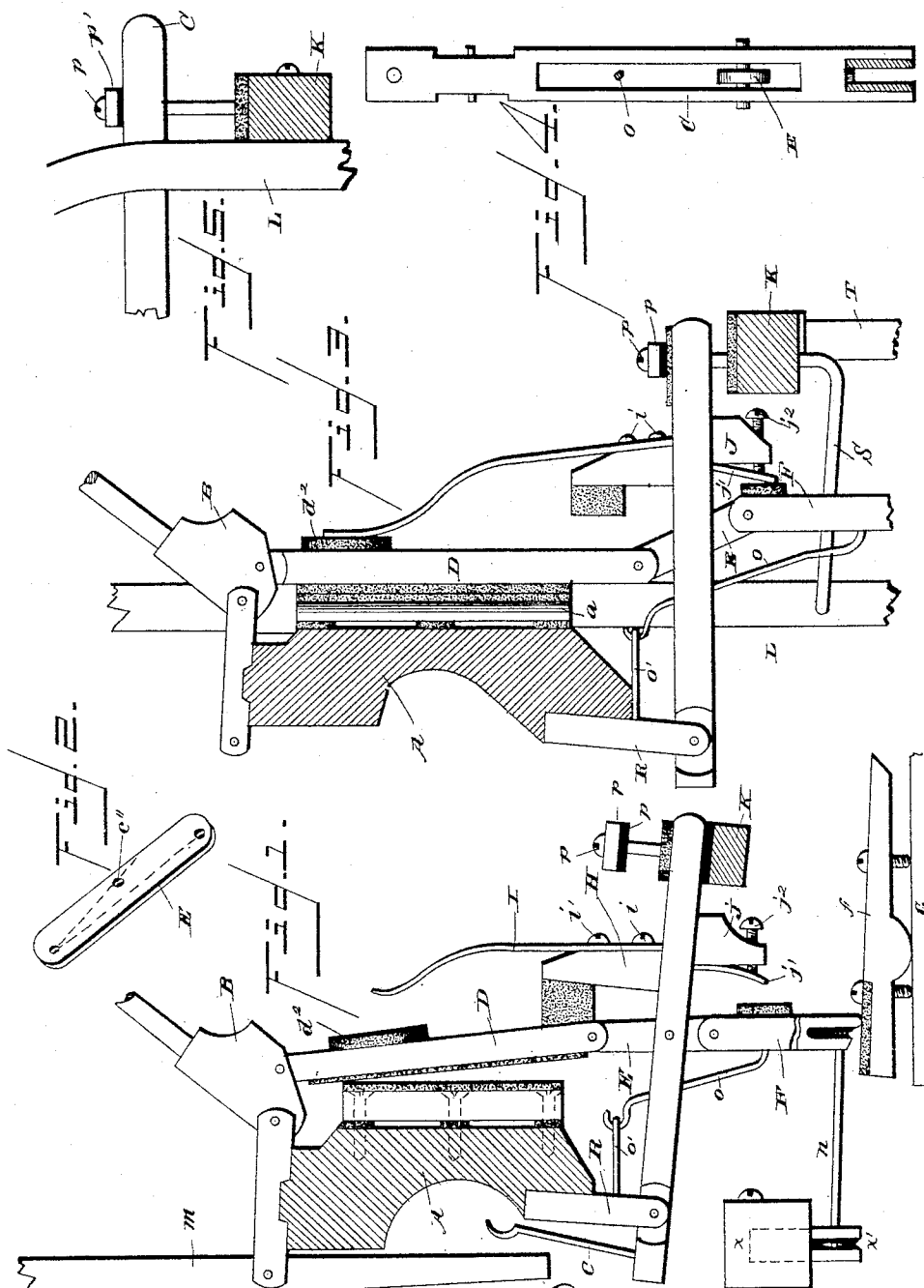


(No Model.)

S. R. PERRY.
PIANO ACTION.

N.o. 449,263.

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UNITED STATES PATENT OFFICE.

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PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 449,263, dated March 31, 1891.

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To all whom it may concern:

Be it known that I, SAMUEL R. PERRY, a citizen of the United States of America, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Piano-Actions, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention pertains to certain new and useful improvements in piano-forte actions, and has for its object the production of a mechanism by which the blows made by the hammer may be fully under the control of the player in the most rapid execution, also when making the shortest possible stroke of the hammer by the least movement of the key, and to provide an arrangement which takes up the momentum of the strokes in the working parts of the same, as well as to provide for full adjustments in the regulation of each part to the others.

In the accompanying drawings, Figure 1 is a side elevation of my improved piano-action. Fig. 2 is a perspective view of the link E. Fig. 3 is a side elevation of my invention when the stroke has been made, the key being held down. Fig. 4 is a plan view of the actuating-lever; and Fig. 5 is a sectional side elevation of the metal bracket to which the bar or rail K is attached for supporting the ends of the bottom or actuating levers and regulating the momentum of the stroke in both directions, more fully shown by movable arm in Fig. 3.

In the embodiment of my invention A represents the action-rail, to which the hammer-butt B is attached in the usual manner. The long link D is pivoted to the hammer and connected at its lower end to the actuating-lever C by means of a double link E. This link E is provided with a pin at each end, also one in or near the center, the central pin acting as a fulcrum when articulated properly to the lever C. The double link E extends below the lever C and is pivoted to the pitman-rod F, which is connected with the key-rocker *f* and is made any length to suit the height of the piano to be constructed.

In the construction of link E it will be seen that the central hole is placed slightly out of direct alignment with the other two holes, by

which means it becomes a lever as well as a link, said link being pivoted to the actuating-lever C at *c''*, at its upper end to the long link D, and at its lower end to the pitman or extension rod F, extending vertically from the piano-key. I do not confine myself to this exact form of the double link E as regards its length, position of holes, nor their relative distances apart, as that is a matter to be determined by practice, nor as to whether the link E shall pass through actuating-lever C or around its sides. This form of link must not be considered as identical with the single link used by me in a former patent, as the extension below lever C and its connection with pitman-rod F is an entirely new feature in piano-actions. The rod F extends from the double link E to the key G, connecting or resting upon the key-rocker *f*, and is so formed at its lower end as to rest upon its forward part only. The upper portion of this pitman is provided with a spring *o*, passing through lever C, said spring in turn being attached to a loop *o'*, which is suitably fastened to the rail A or to flange R. Thus constructed the extension or pitman rod is acted upon and made to have a force upon the double link E in its oscillating movement when operated by the key, which greatly facilitates the lever D and the hammer in coming into proper place after making each stroke.

H is a post or stud attached to the lever C upon its upper face, having a cushion secured to its face, which is designed to break the force of the lever D and hold it in place. Upon the opposite face of post H is a metal strip I, adjustable by means of screws *i* and *i'*.

To the under side of the bottom lever C, I attach a post J, supplied with an adjustable device composed of a tongue or strip *j'*. It may be adjusted toward the rod F by means of the screw *j''* passing through the post J. The inner face of long link D is clothed and the outer face of the rail A is provided with an adjustable strip *a*, secured by screws to the face of the action-rail A, adjustable by means of strips of cloth or packing secured thereto or to the action-rail. Thus by forcing the screws passing through this strip it may be nicely adjusted with relation to rail A in forming a check to hold long link D against its clothed surface and secure the

hammer in its rebound from the string at any desired point, accordingly as the stroke may be hard or soft.

Attached to the bracket L, Fig. 5, is a longitudinal bar K in front of the action and below the bottom lever C, having its upper side cushioned, upon which lever C is intended to be held when the action is at rest, so as to retain it in place. On the upper side of rail K are screws *p*, passing through slots cut in the ends of lever C. The underside of the screw *p*, carrying a buffer *p'*, regulates the height to which lever C can be raised, and is intended to take up and break the momentum of the action in heavy and rapid execution.

In Fig. 3, coming up from the foot-pedal, (not shown,) is the upper end of a post T, so placed as to lift against the bottom of the rail K, and as rail K is articulated to the bracket L by means of an arm S it follows that while the actuating-levers C rest upon the rail K the hammers may be thrown forward with the foot to shorten their stroke or held in any desired position for playing, thus effecting the same purpose as is usually done by moving the hammer-rail. The rear end of lever C carries a spoon *c* to operate the dampers *m*, attached in the usual manner.

Connecting the bottom of the pitman-rod F is a wire *n*, which is made to slip into a clothed slot which has been packed to receive it.

On the rear of the action and attached rigidly to the brackets by means of a screw I place a bar *x*. Into this bar I bore holes to receive a series of slotted and clothed dowels *x'* and in order to attach the other end of the wire *n*, so as to connect and steady rod F in its motions, holding it firmly upon the key-rocker *f* and the key G.

Fig. 3 shows the action after a stroke has been made and the key held firmly, locking the link D against the strip *a*, and thus checking the hammer from rebounding against the string, also holding the upper end of pitman-rod F against the under post J by forming a perfect toggle by means of pitman F, double link E, and long link D.

The operation of my improved piano-action is as follows: When key G is pressed, it acts against the bottom of pitman-rod F, raising it, and as the pins in double link E are somewhat out of line, as seen by Fig. 2, and as the link E is fulcrumed near its center to bottom lever C, it follows that the upper end of link E will be forced toward post H. Thus a somewhat rigid connection is formed from the key to link D and hammer-butt. This relative position is sustained while the key is going down and lever C upward until the hammer is brought near to the string, at which time the metal-strip I, being properly adjusted by means of screws *i* and *i'*, will come in contact with the outer cushioned surface *d'* of the long link D, throwing it quickly toward the rail *a*, and thus suddenly unlocking the connection of the pitman-rod link E, and link D.

Changing the rigidity of the several parts and allowing of a free rebound of the hammer after striking the string and as quickly catching it by checking against the rail *a* and forming an obtuse angle of the links will hold the parts firmly, as shown by Fig. 3, the links E and D and the pitman-rod F forming a complete lock or toggle against the action-rail A and strip *a*. On removing pressure in the slightest degree from key G the spring *o*, pulling rod F by means of its connection with loop *c* and flange R, together with the weight of the several parts, will free the hammer and cause the links rapidly to return to their former positions, as seen by Fig. 1, or the key may be made to operate by the slightest possible stroke of the hammer in the most rapid manner, having perfect control by means of the perfect connection of all its parts and the mechanical certainty of its motions.

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

1. In a piano-action, the double link fulcrumed to the actuating-lever and having its connecting ends extending above and below said lever, substantially as shown and described.

2. The actuating-lever having its end and central portion cut through to receive the double link, the spring, and the regulating-screw, substantially as shown and described.

3. The double link fulcrumed to the actuating-lever and extending below the same, having its upper end connected to the hammer-butt by means of the long link, substantially as shown and described.

4. The double link fulcrumed to the actuating-lever, its lower end extending through the same and pivoted to the connecting-rod or pitman, in the manner shown and for the purpose described.

5. The actuating-lever having a post or stud attached to its under face, adapted by means of an adjustable device to engage the extension or pitman rod, substantially as shown and described.

6. The link fulcrumed to the actuating-lever and extending below said lever and the bottom or actuating lever carrying the post upon its upper face, said post being provided with an adjustable strip and screws and adapted to engage the long link, substantially as shown and described.

7. The rail K, adapted to support the actuating-lever and its adjusting-screws in the manner and for the purposes described.

8. The rail carrying on its upper surface a screw and adjusting-pad, in combination with the actuating-lever having its forward end slotted and clothed vertically, substantially as shown and described.

9. The pitman-rod provided with the spring and loop and attached to the actuating-lever by means of the double link, substantially as shown and described.

10. The adjustable check-strip *a*, attached

and combined with the action-rail A, adapted to act in holding the link connected to the hammer-butt, substantially as shown and described.

5 11. The double link fulcrumed upon the actuating-lever and extending below the same and having its upper end pivoted to the long link, said link adapted to engage the adjustable check-strip on the rail, substantially as shown and described.

10 12. The double link pivoted to the actuating-lever and extending below the same, combined with the damper-actuating lever by means of a spoon attached to said actuating-lever at its upper rear end, substantially as shown and described.

15 13. The actuating-lever provided with a vertical slot in its forward end to receive the adjusting-screw on rail K, substantially as shown and described.

20 14. The actuating-lever cut through to receive the spring of the pitman-rod, substantially as shown and described.

15. The double link fulcrumed to the actuating-lever, the same being slotted and 25 bushed, in combination with the rail K and the regulating-screw P, substantially as shown and described.

16. The extension-lever or pitman attached to the lower end of the double link, said link 30 fulcrumed to the actuating-lever and connected at its upper end to lever D, all arranged substantially as shown and described.

17. The longitudinal bar *x*, provided with a series of slotted and bushed dowels for 35 holding the connecting-wire and attaching the pitman-rod to said rail or bar, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

S. R. PERRY.

Witnesses:

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E. F. MCGOVERN.