

(No Model.)

J. ZECH.
PIANO ACTION.

No. 333,047.

Patented Dec. 22, 1885.

FIG. 1.

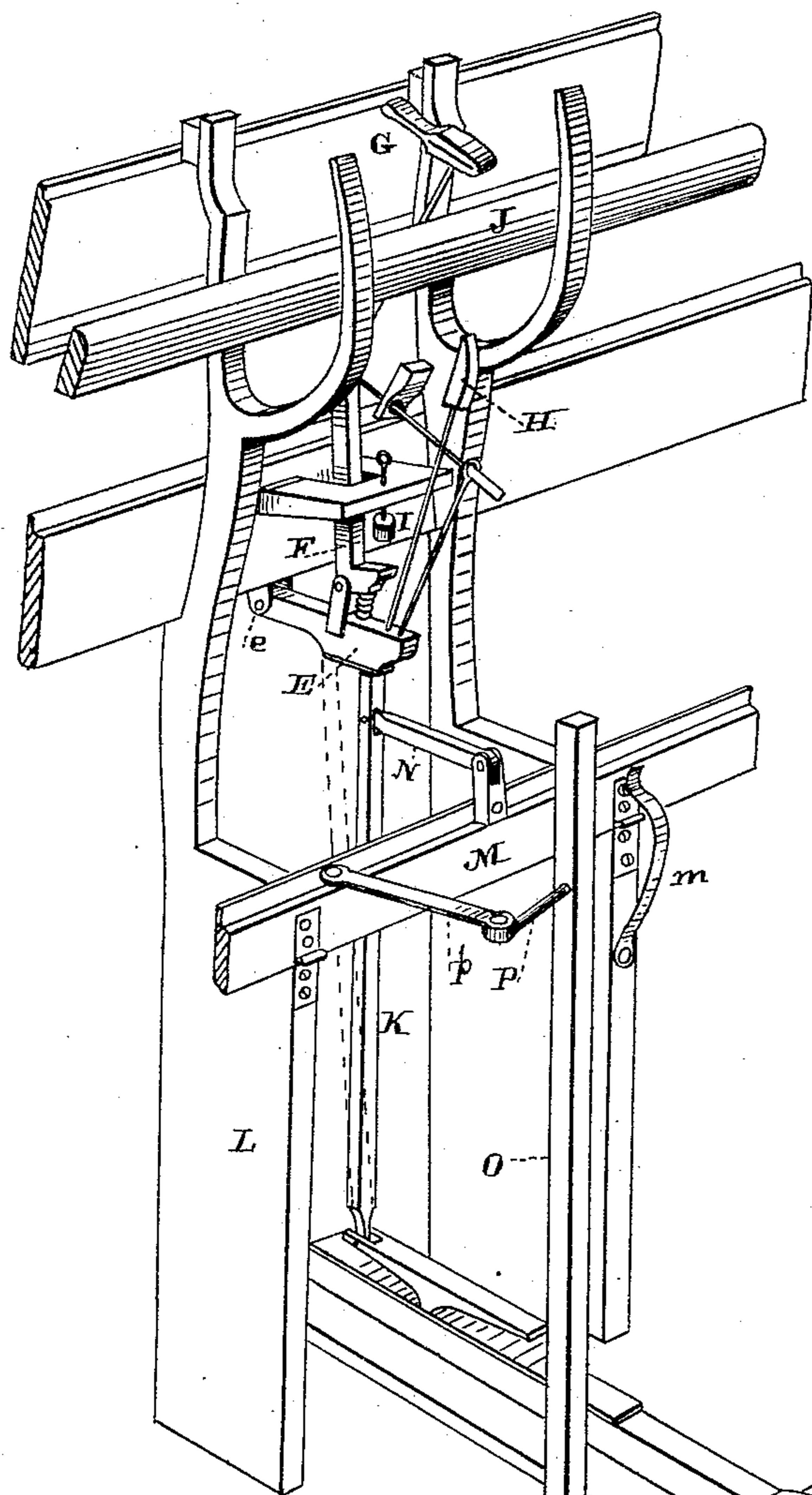
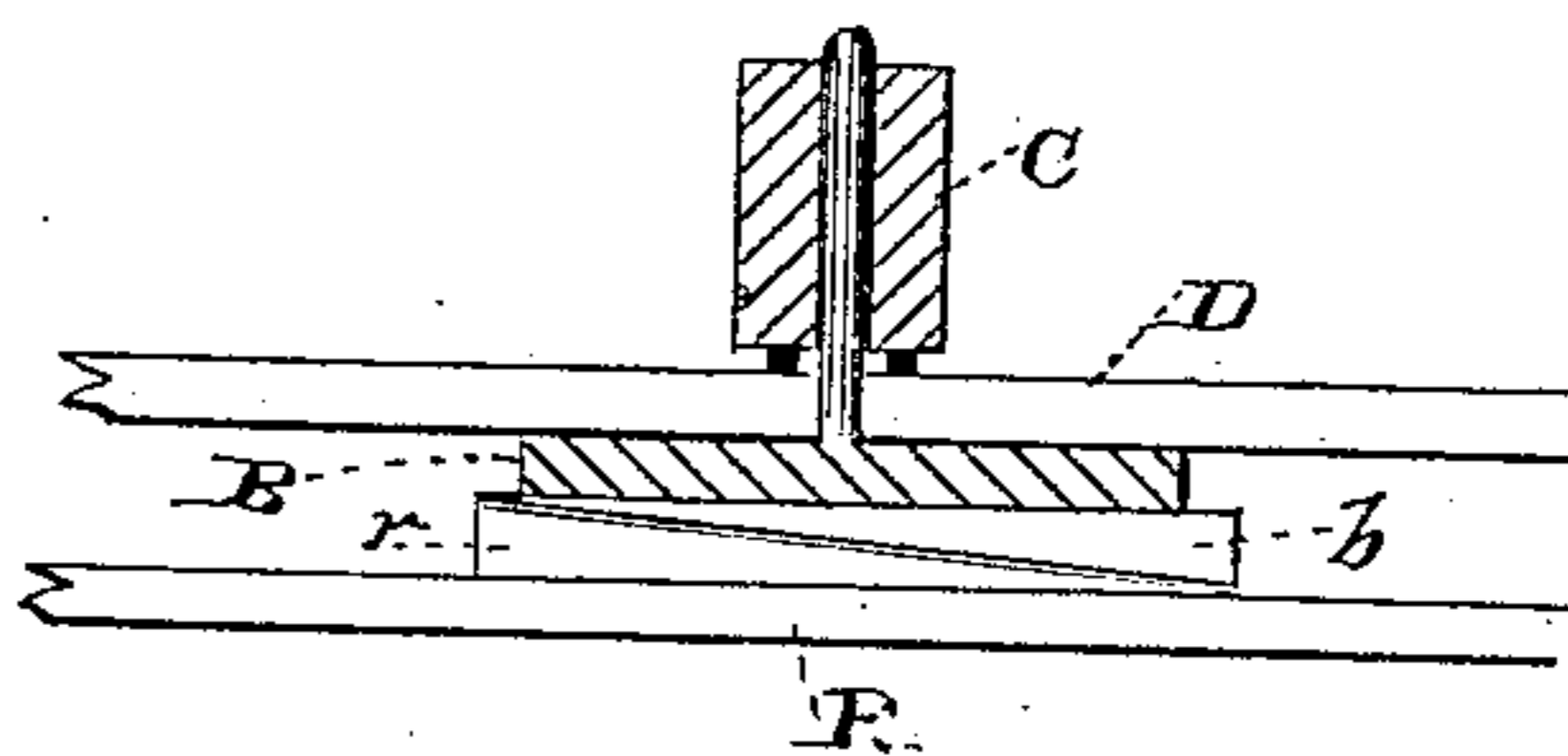


FIG. 2.



Witnesses
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JACOB ZECH, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO AUGUST F. ZECH, OF SAME PLACE.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 333,047, dated December 22, 1885.

Application filed March 20, 1884. Serial No. 124,971. (No model.)

To all whom it may concern:

Be it known that I, JACOB ZECH, of the city and county of San Francisco and State of California, have invented an Improvement in Piano-Fortes; and I hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to piano-fortes; and it consists in the construction, novel arrangement, and adaptation of devices, as will be hereinafter more fully set forth and claimed.

The object of my invention is to make the keys work lighter or heavier by regulating their resistance, whereby the touch may be adjusted to suit any player.

Referring to the accompanying drawings, Figure 1 is a perspective view, showing my improvement as applied to the key and action of an upright piano. Fig. 2 is a sectional and elevational detail view, showing the means for vertically adjusting the key.

A is the key-bottom; B, the key-frame, and C is a key fulcrum on the frame by the intervention of the usual balance-rail, D.

The parts above constitute the well-known key-action of any upright piano, though I do not confine myself to such action, as it may be varied in different pianos, according to their make, or their character, as upright or square, &c.

E is the jack-lever, pivoted at *e*. F is the jack, which connects with the butt of hammer G. H is the back jack, and I is the regulating-screw. J is the hammer-rest rail. The damper is not here shown, nor the strings. The action of these parts is well known. The motion of the key is transmitted to the jack-lever by means of an upright bar, K, the lower end of which is pivoted to the rear end of the key. The upper end of this bar impinges under the jack-lever E, and heretofore it has been the practice in many cases to fasten it thereto permanently. Now, it is obvious that if the point of impingement or connection between the jack-lever and the bar K be moved back nearer the pivot-point of said lever it will require more power to raise the lever and operate the action than if it be moved farther from the pivot-point, as in the latter case a greater leverage is obtained. Between these

limits the power necessary to operate the keys may be regulated to suit each person. I therefore do not fasten the top of bar K to the jack-lever, but merely allow it to impinge, whereby the said bar may be moved back or forth.

In order to make the contact noiseless and to avoid wear, I place a small strip of some fabric under the jack-lever.

I shall now describe a mechanism by which I change the point of contact of the bar with the jack-lever. Hinged to suitable uprights, L, is a strip, M, held by a spring, *m*, and connected with the upright K by means of a link, N. O is a vertical post mounted in a step, *o*, in the key-bottom. From its side near the top extends an arm, P, which is connected with the upper edge of the hinged strip M by a link, *p*. Pivoted on the key-bottom is a lever, Q, connected by a pin, *q*, with a slide, R. A short rod, S, connects this slide with the post O. By the movement of the lever Q, acting through the slide, the post O is turned, drawing or pushing on the hinged strip M, and pulling forward or forcing back the bar K, for the purpose described. The strip M is to extend across the whole front of the action, and is to be connected with each bar, similar to K; but the mechanism for operating the hinged strip M may be placed at one or both ends, and may be varied according to circumstances, and such portions as are exposed may be rendered as ornamental as desirable.

There is a further point to be considered in connection with the movement of the bar K on the jack-lever. It is required that the jack-lever shall move upward far enough to throw the base or offset portion of the jack against the regulating-screw I. Now, when the bar K is adjusted back on the jack-lever, it is obvious that it will have to move vertically a shorter distance to throw the jack-lever up to its limit than it will have to move when it is adjusted forward on said lever. Therefore it is necessary to give adjustable limits to the movement of the key. I do this by the slide R. Upon this slide is a wedge, *r*, which moves under an oppositely-cut wedge, *b*, under the key-frame B. The key-frame is loose at both ends, or it may be rendered oth-

erwise movable, as by sawing it in places transversely, so that it can bend at its center. When the slide R is moved in a direction to adjust the bar K back on the jack-lever, the same movement separates the thick portions of the wedges *r b*, whereby the key is lowered. This is what is wanted, because the key need not have so great a limit of movement; but when the slide is moved the other way and the bar K is adjusted forward the movement of the key must be greater, and therefore the wedges meet in such manner as to raise the key-frame and key.

The limit of movement of the key is defined by the cushion T under its end, and therefore when the key is raised it can move farther to its limit, and when lowered its movement is less.

It will be seen that the operation of lever Q accomplishes the dual object of adjusting the bar K on the jack-lever, and of adjusting the key to conform to the adjustment of the bar.

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

1. In a piano-forte, a connection between the oscillating key and the actuating-lever of the action, whereby said lever is operated, said connection being adjustable back and forth on said lever, whereby the touch or resistance of the key is regulated, substantially as described.

2. In a piano-forte in which the action is operated by a pivoted jack-lever, a bar connected with the key and having its other end impinging against and adjustable back and forth under said jack-lever, substantially as and for the purpose herein described.

3. In a piano-forte in which the action is operated by a pivoted jack-lever, a bar connected with the key and having its other end impinging against the jack-lever, whereby power is transmitted to said lever, and a lever Q, slide R, and a post, O, with their connections, for moving the end of said bar back and forth on said jack-lever, to vary its work and regulate the resistance of the key, substantially as herein described.

4. In a piano-forte in which the action is operated by a pivoted jack-lever, a bar connected with the key and having its other end impinging against the jack-lever, whereby

power is transmitted thereto, a lever, Q, slide R, and post O, or their equivalent, for moving the end of said bar on said jack-lever, and for varying the limits of motion of the key, substantially as and for the purpose herein described.

5. In a piano-forte in which the action is operated by the pivoted jack-lever E, the bar K, connected with the key and impinging against the jack-lever, the hinged strip M, connecting-link N, and mechanism for turning said strip on its hinges to adjust the bar K under the jack-lever, substantially as and for the purpose herein described.

6. In a piano-forte in which the action is operated by the pivoted jack-lever E, the bar K, connected with the key and impinging against the jack-lever, the key C, the hinged strip M, and link N, connecting it with the bar K, the sliding strip R, having wedge *r*, and movable key-frame B, having wedge *b*, and a connection between said hinged strip M and sliding strip R, whereby they may be operated simultaneously, substantially as and for the purpose herein described.

7. In a piano-forte in which the action is operated by the pivoted jack-lever E, the bar K and key C, the hinged strip M and link N, in combination with the post O, having arm P and link *p*, and means for turning said post, substantially as herein described.

8. In a piano-forte, the means for vertically adjusting the keys, consisting of the movable key-frame B under the balance-rail, and having wedge *b*, and the sliding strip R, having wedge *r*, substantially as herein described.

9. In a piano-forte in which the action is operated by the pivoted jack-lever E, the bar K, key C, hinged strip M, link N, the sliding strip R, having wedge *r*, and movable key-frame B, having wedge *b*, in combination with the post O, having arm P and link *p*, the rod S, connecting said post with the sliding strip, and the lever Q, connected with said strip, all arranged and operating substantially as and for the purpose herein described.

In witness whereof I have hereunto set my hand.

JACOB ZECH.

Witnesses:

C. D. COLE,
J. H. BLOOD.