

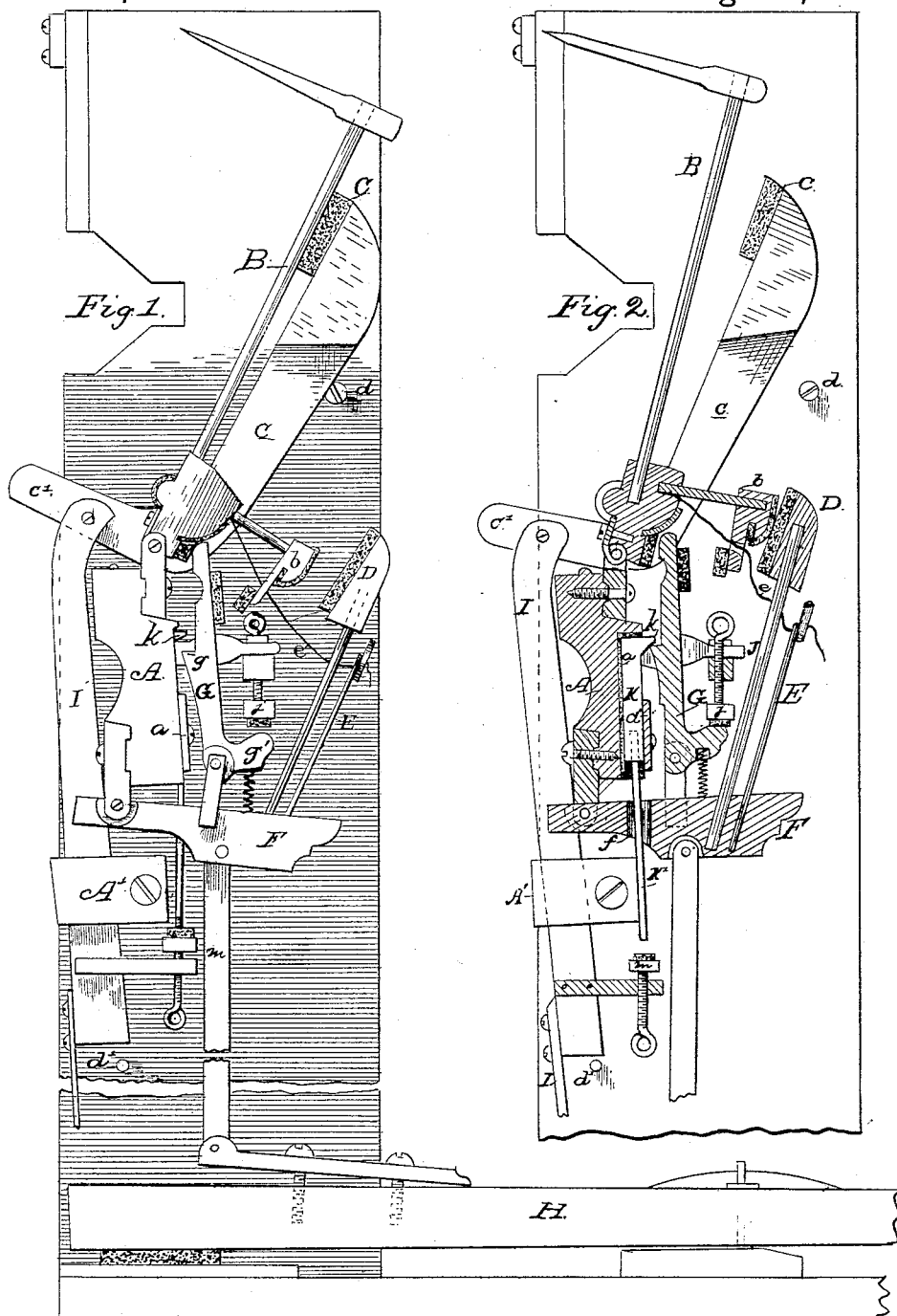
(No Model.)

2 Sheets—Sheet 1.

J. W. COOPER.
PIANO ACTION.

No. 348,111.

Patented Aug. 24, 1886.



Witnesses

Susan R. Lailor.
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Inventor

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(No Model.)

2 Sheets—Sheet 2.

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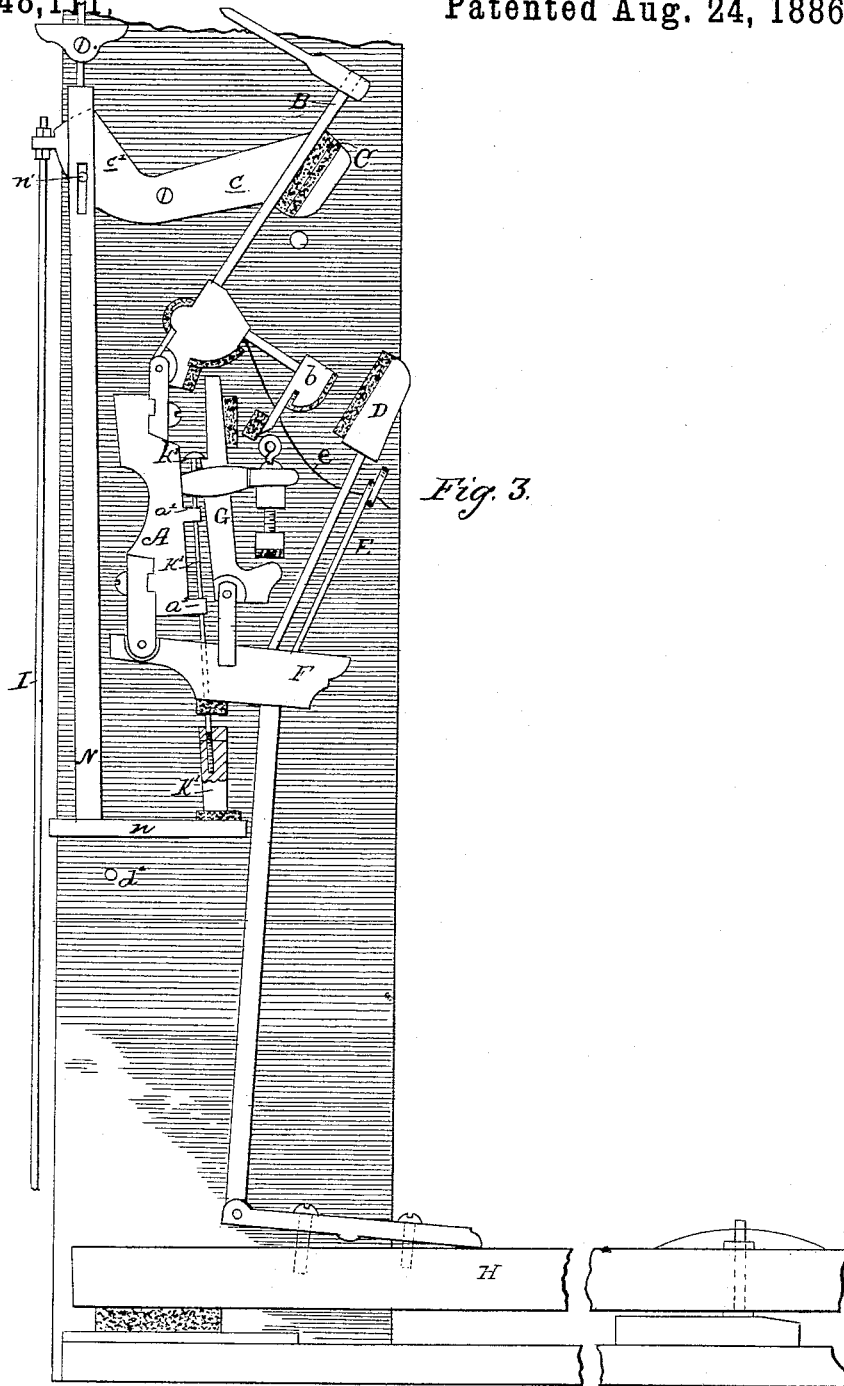


Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN W. COOPER, OF BOSTON, MASSACHUSETTS.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 348,111, dated August 24, 1886.

Application filed January 7, 1886. Serial No. 187,910. (No model.)

To all whom it may concern:

Be it known that I, JOHN W. COOPER, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Piano-Actions; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to piano-actions, and particularly to that class known as "upright actions," in which a movable rail and suitable connections are employed for moving it for varying the distance between the hammers and strings, to govern the length of the stroke of the hammers and their consequent force of blow on the strings. The object in view is to regulate the tone and volume of sound at pleasure without varying the touch.

With these ends in view and such others as may appertain to my invention, it consists in combining with the key-operated jacks weights to compensate for the varying positions of the hammers for preserving a uniform and even touch; in the combination with the adjustable hammer-supporting rail a weight-supporting arm simultaneously adjusted therewith to project the weight within or without the path of the jack. It also consists in novel features and details of construction and combinations of parts, which will be more fully hereinafter set forth and particularly claimed.

In the drawings, Figure 1 is a side view of a piano action constructed according to my invention. Fig. 2 is a similar view, partly in section and in a different position. Fig. 3 is a side view with slight variations in details of construction.

The supporting-frame A A' for the upright action is of ordinary construction. The hammer B is pivoted to the upper edge of the support A, and is limited in its backward movement by the rail C. The hammer-butt has a rear projection, b, which impinges against the check D, and a bridle, e, connects the butt with an arm, E, extending from the tilting-lever F, supporting the spring-actuated jack

G. The tilting-lever is operated by the key H and suitable interposed connections.

The rail C is supported on a lever, c, by which it may be adjusted to regulate the position of the hammer, as will more fully hereinafter appear. The end c' of the lever projected beyond the fulcrum is connected with the pedal-operated rod I. The backward movement of the lever c is limited by the stop d, and its forward movement by the stop d'. The pedal-operated rod may be continuous, as shown in Fig. 3, or made in section, as shown in Figs. 1 and 2, in which latter case the lower end of the upper section contacts with the stop d'.

The jack G has a shoulder, g, and a rear extension, g', to contact with an adjustable stop carried on the end of a set-screw, j, passing through an arm, J, projected from the frame A.

In the operation of the action, when the lever c is resting on the stop d, which is its normal position, the hammer has its greatest throw, consequently it strikes with great force. In its normal position the end of the jack is close to the butt, as most clearly shown in Fig. 1. When it is desired to moderate the tone and diminish the force of the blow, the hammer is adjusted nearer to the strings by actuating the pedal-rod, which causes the lever c to advance the rail nearer the strings. This adjustment increases the distance between the butt and the end of the jack and decreases the throw of the hammer. On operating a key, owing to the distance between the hammer-butt and the end of the jack, it would be found that the touch would vary. To overcome this objection and maintain a uniform and even touch, a weight is so constructed and combined with the action that it is in contact with the jack while the latter is traversing the distance between its end and the hammer-butt, to compensate for the weight of the hammer, and becomes disengaged from the jack the moment the latter touches the butt to throw the hammer. The weight may be applied in numerous ways, but for the sake of simplifying matters only two are shown.

In Figs. 1 and 2 the frame A is grooved directly opposite to and on that side adjacent the jack. A weight, K, is seated in this groove a, and is provided with a lip, k, which projects

within the path of the shoulder *g* of the jack. The weight has a vertical movement in the groove, and is held in place by a plate, *a'*. A rod, *k'*, extending downward, passing through an opening, *f*, in the tilting-lever, is adapted to have its lower end engaged by an adjustable stop, *m*, projected upward from an arm connected with the lever *c* by the rod *I*. When the hammer is in its normal position, the stop *m* is at its highest position, and, contacting with the rod *k'*, lifts the weight sufficiently high to carry the lip *k* out of the path of the shoulder of the jack, as shown in Fig. 1. The hammer being adjusted nearer the strings by the shifting of the rail *C*, the stop *m* is correspondingly lowered, and the lip of the weight falls within the path of the shoulders *g* of the jack, which latter, when operated, elevates the weight, and the moment the end of the jack strikes the butt of the hammer the extension *g'* strikes the stop *j* and disengages the jack from the weight, as clearly indicated in Fig. 2.

Instead of the groove *a*, projections *a'* may be extended from the frame *A* and the rod *k'* passed loosely therethrough. The upper end of this rod is extended to form a head to contact with the shoulder of the jack, and its lower end is provided with the weight *K'*, which normally rests on an arm, *n*, of a rod, *N*.

The upper end of the rod *N* is slotted, and a pin, *n'*, projected laterally from the lever *c*, extends into the slot. By this means an adjustment of the arm *n* is effected simultaneously with the adjustment of the lever *c*, and

the head *k'* of the weight-supporting rod thrown into or out of the path of the jack. Instead of the adjusting-stop *m*, as shown in Figs. 1 and 2, the lower end of the rod may be threaded and screwed into the weight.

While only one lever, *c*, is shown, it is manifest that two or more may be employed.

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

1. The combination of the hammers, adjustable rail, and operating-jack, of a weight to contact with the jack during a part of its movement, substantially as described, whereby a nearly uniform touch is preserved during the whole operation of the key.

2. The combination of the hammer, an adjustable rail, a weight, a jack, a weight-support, and a rod connecting the rail and support, whereby both may be simultaneously adjusted and the weight projected into or out of the path of the jack, substantially as and for the purposes set forth.

3. The combination of the hammer, adjustable rail, operating-jack, a weight contacting with the same during a part of its movement, and a stop to disengage the weight and jack the moment the latter contacts with the butt of the hammer, substantially as set forth.

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

JOHN W. COOPER.

Witnesses:

WM. H. MILLER,
C. G. SHEDD.