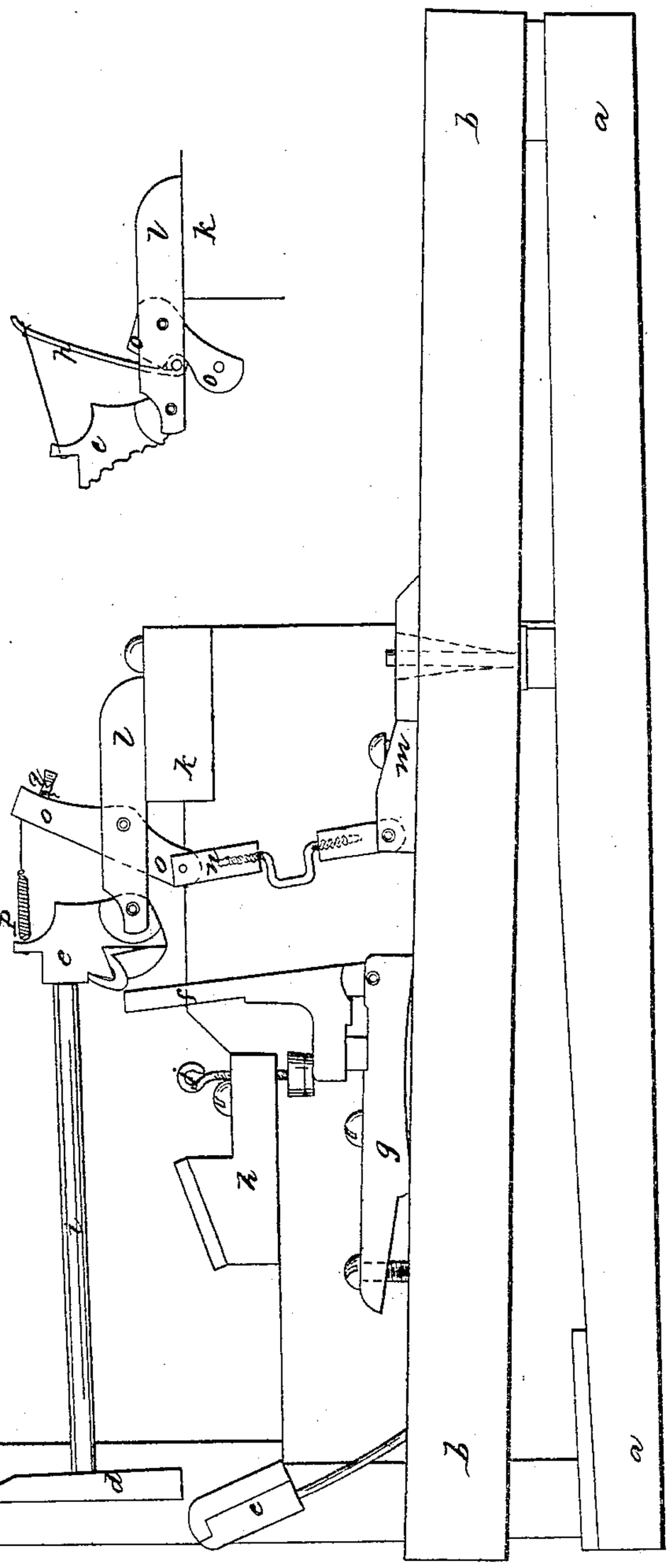
J. Hurd,

Piano Action,

No. 60,520. Patented Dec. 18, 1866.



Witnesses.
W. B. Crosby
Chas Fowler

Inventor.
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United States Patent Office.

REPEATING-ACTION FOR PIANO-FORTES.

JOSEPH HURD, OF BOSTON, MASSACHUSETTS.

Letters Patent No. 60,520, *dated December* 18, 1866.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOSEPH HURD, of Boston, in the county of Suffolk, and State of Massachusetts, have invented an improved Repeating-Action for Piano-Fortes; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practise it.

This invention consists in the combination and arrangement of the devices which I employ for sustaining the hammer, after a blow has been given thereby, in a raised position, so that upon very slight elevation of the key the jack-fly will at once assume its position under the hammer-but in readiness to give the repeating blow even in the most rapid trilling.

To illustrate my invention I have shown it in the drawings, as applied to the well-known form of action known as the French action, the principal view exhibiting in side elevation a section of such an action with my improvements added thereto. *a* represents the foundation-board, *b* the key-lever, *c* the back-check for the hammer *d*, *e* the hammer-but, *f* the fly of the jack which is secured to the key-lever and is regulated thereon by means of screws in the base, *g*, of the jack in the usual way; *h* is the rail on which the hammer-shank, *i*, lies when the action is at rest in its normal position, said rail also serving to receive the screw-stop *j*, which acts to throw the fly of the jack from beneath the hammer-but; *k* is the flange-rail to which the flange *l* is secured, said flange being the piece to which the hammer-but is pivoted. All of these parts and their arrangement and operation are old and well known, and are mentioned only to show the connection therewith of my improvements, which I will now proceed to describe. On the key-lever *b* is secured a piece, *m*, for the purpose of pivoting thereunto the link *n*, which is made of two pieces, an upper and a lower one, joined together by a means for lengthening and shortening the link, the means shown being a wire with a right-hand screw formed on one end and a left-hand screw on the other end, the bend in the wire forming a convenient means for turning it. A lever, *o*, is pivoted in the slot in the flange *l*, the lower end of the lever and the upper end of link *n* being pivoted together, so that in the rise and fall of the key-lever *b* the lever *o* is caused to vibrate. A slight spiral spring, *p*, is secured to the top of the hammer-but, and this spring is connected with lever *o* by a string or thread with a small turn or wrist-pin, *q*, for the purpose of adjusting the tension of the spring and regulating its action on the hammer. The drawing shows the parts in the position which they assume after a blow has been struck by the hammer, with the key-end of lever *b* almost fully depressed. It will be seen that the hammer is sustained in an elevated position just below the string *r*, by the connection of the hammer-but through the spring and thread with the lever *o*, the spring being distended by the weight of the hammer-head, shank, and but. In this position the jack-fly will spring back into position under the but whenever the key-end of the lever *b* is allowed to rise slightly so as to free the fly from the control of the screw-check *j*. The parts will then be in condition to give the repeating blow with slight movement of the key-lever, and any number of such repeating blows can be given in succession by vibrations of the key-lever of slight extent. Without the support of the hammer by the spring full vibrations of the key-lever have to be made to obtain repeating blows, rendering the execution of a trill very difficult. The movement of the point of attachment of the thread is similar to the movement of the upper part of the hammer-but, so that there is little action of the spring except when the jack-fly is thrown out from under the but, and then the function of the spring is to sustain the hammer till the jack-fly resumes its position under the but. Many modifications in the form of my invention may be made without departure therefrom. One such modification is shown in the small detail drawing, the spring used being of different form from that before alluded to, it being attached to and forming part of the lever *o*. My invention is applicable to forms of action other than that shown herewith, and may be applied with the same good results to upright and grand actions. An incidental advantage flowing from my invention is that the clothing on the shank rest *h* may be dispensed with, as the hammer is with my invention always sustained either on the jack-fly on the back-check *c*, or on the upholding, yielding support, and from this it follows that relief is had from the frequent adjustment of the jacks necessitated by compression of the clothing at the rear end of lever *b*, which leaves in the normal position of the action play between the end of the jack-fly and the hammer-but, detracting from the vigor of the blow and making the action disagreeable to the touch.

I claim, for the purpose of supporting the hammer of a piano-forte action near its string in position to give a repeating blow, the combination of an elastic support of the hammer-but with a lever, *o*, when this is connected with the key-lever actuating the hammer, by means of the link *n*.

Also, the employment of the right and left-hand screw in the link *n*, for the purpose of adjusting the position of lever *o*.

JOSEPH HURD.

Witnesses:

J. B. CROSBY,

FRAS. GOULD.