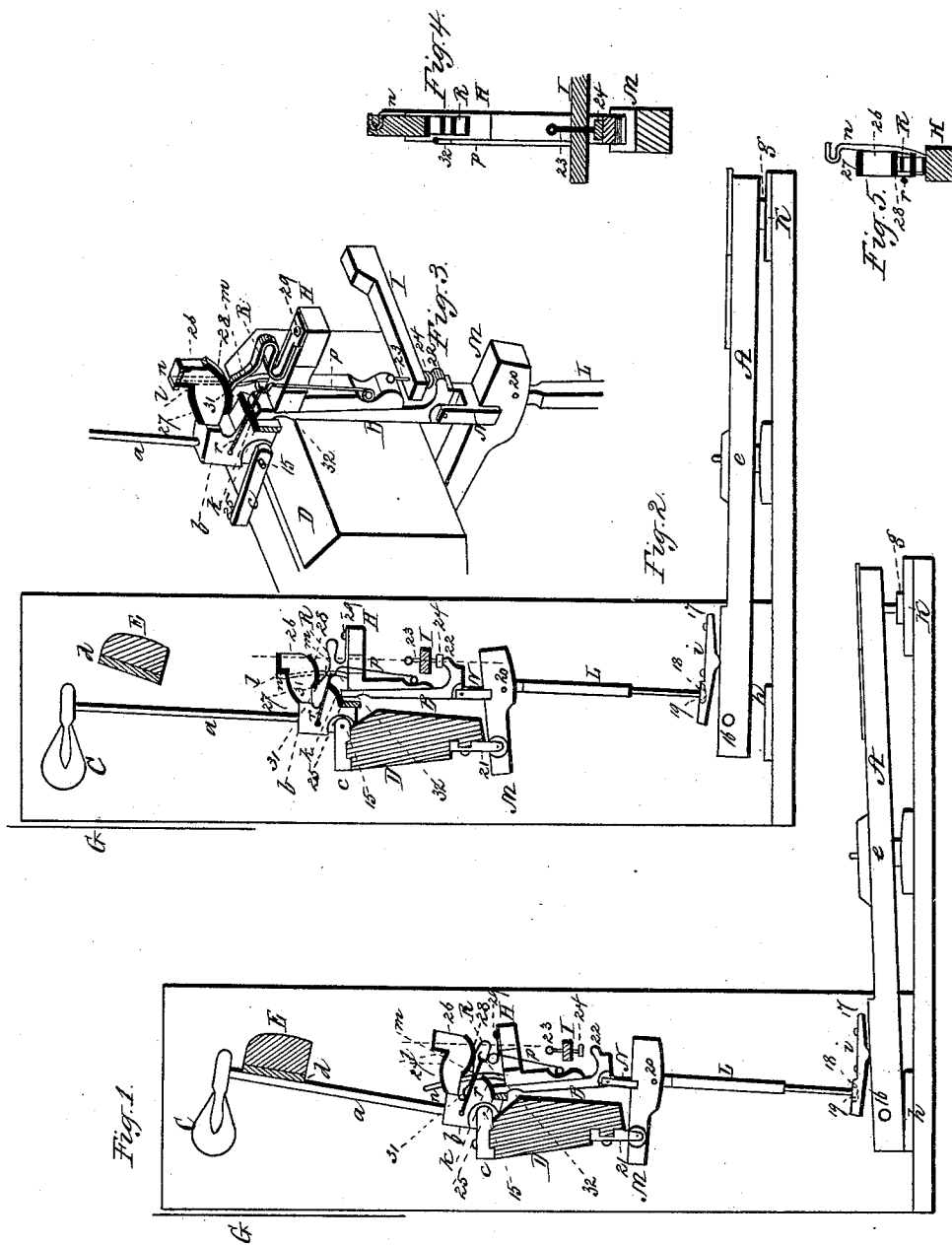


(No Model.)

W. MUNROE.
UPRIGHT PIANO ACTION.

No. 570,041.

Patented Oct. 27, 1896.



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UNITED STATES PATENT OFFICE.

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UPRIGHT-PIANO ACTION.

SPECIFICATION forming part of Letters Patent No. 570,041, dated October 27, 1896.

Application filed February 27, 1896. Serial No. 581,059. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MUNROE, of the city, county, and State of New York, have invented certain Improvements in Upright-Piano Actions, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a side elevation of an upright-piano action constructed in accordance with my present invention, the several parts being in their normal position—*i. e.*, the hammer, jack, and key-lever being at rest. Fig. 2 is a side elevation representing the key depressed and the hammer-rod in its upright position immediately after the recession of the hammer from the string. Fig. 3 is a perspective view of the essential features of my present invention, on a larger scale; Figs. 4 and 5, sectional details.

The objects of my present invention are particularly set forth in Letters Patent of the United States, No. 551,832, dated December 24, 1895, the said objects being, to wit, to obtain elasticity of touch with prompt and rapid responses of tone and power of stroke by the employment of a minimum number of parts of simplest construction, which permanently retain their effectiveness under the various conditions or changes of the atmosphere and of transportation from place to place; and this invention consists, in combination with the hammer and a bracket secured to the jack, of certain other springs of different construction, arrangement, and operation than those specified in my said recent Letters Patent, by which I accomplish the aforesaid requirements, so essential in instrumental practice, said springs and their related parts being hereinafter fully described and specifically claimed.

In the said drawings, A represents the key-lever; B, the lifting-jack; C, the hammer; *a*, the hammer-rod; *b*, the hammer-butt; *c*, a bifurcated cleat screwed to the hammer-butt rail D, and to which cleat the hammer-butt is pivoted at 15.

E is the hammer-rest rail, provided with an inclined cushion *d*, against which the upper end of the hammer-rod rests when in its normal position—*i. e.*, when the key is not de-

pressed and the parts are seen in the position shown in Fig. 1.

One of the strings is represented by a vertical line G.

H is a right-angular bracket secured to the front of the jack B, and I is the escapement-rail.

The key-lever is pivoted at *e*, and its outer or key end, when depressed, strikes a cushion *g*, secured to the transverse key-rail *k* thereunder, and the inner end of the key-lever is weighted at 16, and in its normal position rests on a cushion *h* in a well-known manner.

i is a rocker rigidly secured by adjusting-screws 17 to the upper side of the inner end of the key-lever, and is provided with a socket 18 for the reception of the lower cushioned foot 19 of the upright lifting-rod L, pivoted at its upper end at 20 to a guide-lever M, pivoted within a bifurcated arm 21, projecting down from and secured to the under side of the hammer-butt rail D. This guide-lever M has a bifurcated standard N rising from its upper side, to which is fulcrumed the bent foot 22 of the jack, which is located under the escapement-rail I.

Passing through the escapement-rail is an adjustable screw 23, provided with a regulating-button 24, against the under side of which the upper side of the jack-foot is brought into contact by the ascent of the lifting-rod L, when pressure is applied to depress the key, the upward and downward movements of the jack being insured and controlled by the rocking of the guide-lever M, while the vibration or tilting forward of the foot of the jack is produced by the contact thereof with the button 24, which is elastic, the spring used by me under the jack-foot in the construction shown in Patent 551,832 being dispensed with in my present construction.

The lower part of the hammer-butt's front at and a short distance above and below its shoulder 25 is provided with a cushion *k*, which is in constant contact with the top of the jack when raised, and also when down, and is in contact with the back of the jack near its top when the jack is down.

Projecting from the front of the hammer-butt is an offset 26, provided with a cushion 27 on its upper surface which is formed with

a shoulder 7. The lower surface of the hammer-butt offset is also provided with a cushion or pad 28.

On the upper or horizontal arm of the bracket II is secured at 29 the front broad foot of a flat spring R, resembling in shape the letter S reversed, and with its upper surface *m* elongated and bent up at its rear end 31.

When the hammer is at rest, (see Fig. 1,) the cushion 28 bears on the surface *m* of the spring and does not come into contact with the elongated bent end 31. When, however, the hammer leaves its state of rest, the cushion 28 recedes from its seat on the upper surface *m* of the spring R, and immediately after the hammer has struck the string and is being returned (in a manner presently to be described) into an upright position near the spring ready for the repetition of the stroke the rear end of the cushion 28 is supported by the elongated upper end 31 of the spring R. (See Fig. 2.) Simultaneous with the return of the hammer into its upright position ready for a repetition of its stroke and while the cushion 28 on the hammer-butt is supported by the elongated end 31 of spring R the hammer is checked and held motionless by the stop *n* rising from the bracket II, which is brought forward against the shoulder *l* of the hammer-butt offset 26, in which position the key is depressed and the parts are in the position seen in Fig. 2.

The form of the spring R, as stated, approximates to that of the letter S reversed, this shape being particularly favorable for economy of space, which in arranging piano-actions is of great value. Several of the features which I have just described—viz., the peculiar shape of the hammer-butt offset 26, the S-shaped spring R, the stop *n*, and the bracket II, to which said stop and spring are secured—I believe are departures from ordinary piano-actions. To perfect, however, the construction, the hammer after its stroke must be held in a position near the string (as long as the finger is on the key) so as to be thrown against the string in quick succession by a small motion of the key, and I find by years of experience to obtain the best responsive and repeative results, and to enable the performer to rapidly vibrate the strings and to “trill” with a delicate touch, that the checking and holding the hammer motionless in such position must only be for a minute period of time to allow the jack to be thrown back into its normal position, as when the key is at rest. I will now describe the device which I have originated and which makes such consummation possible.

To the front and near the bottom of the bracket II is secured by a coil the foot of a round light wire spring *p*, which extends in

nearly an upright direction and terminates in a bend or hook 32, located in a plane slightly above the point 15, at which the hammer-butt *b* is pivoted. This hooked end 32 is connected with the hammer-butt 26 by a ligature, loop, or band of silk-worm gut or parchment or cord or connection of silk or tape of linen *r* of a sufficient length to create an easy, elastic, permanent tension of the spring at all times, the degree of tension being least when the hammer is at rest and gradually increasing as the hammer advances toward the string, (on the depression of the key,) said tension being greatest as the hammer strikes the string, whereby the backward movement of the hammer after striking is facilitated and the jack instantly returned to its normal position. (See Fig. 1.) The tension of the said spring *p* keeps the jack B hugging under the cushion of the hammer-butt and enables the spring to perform the above-recited double function.

A flat spring having its lower end secured or not by a coil to the jack or bracket may be employed instead of the round wire spring *p* described, and will answer a very good purpose; but such substitution is but a substantial equivalent thereof.

The spring R may be associated with a different spring than that *p* and the desired functions be fulfilled, and the spring *p* may also be employed in connection with a differently-constructed spring than that R or the bracket on which it is seated, and the results still be satisfactory.

I claim—

1. In combination with the bracket II and hammer-butt *b*, a spring *p* having one end secured to the bracket, and a connection or ligature *r* extending from the other end of said spring to the hammer-butt, as set forth.

2. The jack B, bracket II, spring R seated upon the latter, and the hammer-butt *b* and its offset 26 combined, constructed and arranged to operate as specified.

3. The stop *n* in combination with the hammer-butt *b*, its offset 26 and shoulder *l*, the jack B and bracket II, as described.

4. The jack B, bracket II, spring R hammer-butt offset 26 with its shoulder *l* and the stop *n*, combined and operating as set forth.

5. The spring *p*, ligature or connection *r*, hammer-butt *b*, jack B and bracket II, in combination with the spring R, stop *n* and hammer-butt offset 26 with its shoulder *l* constructed to operate as specified.

Witness my hand this 13th day of February, 1896.

WILLIAM MUNROE.

In presence of—

WILLIAM T. INNES,
JAMES MUIR.