

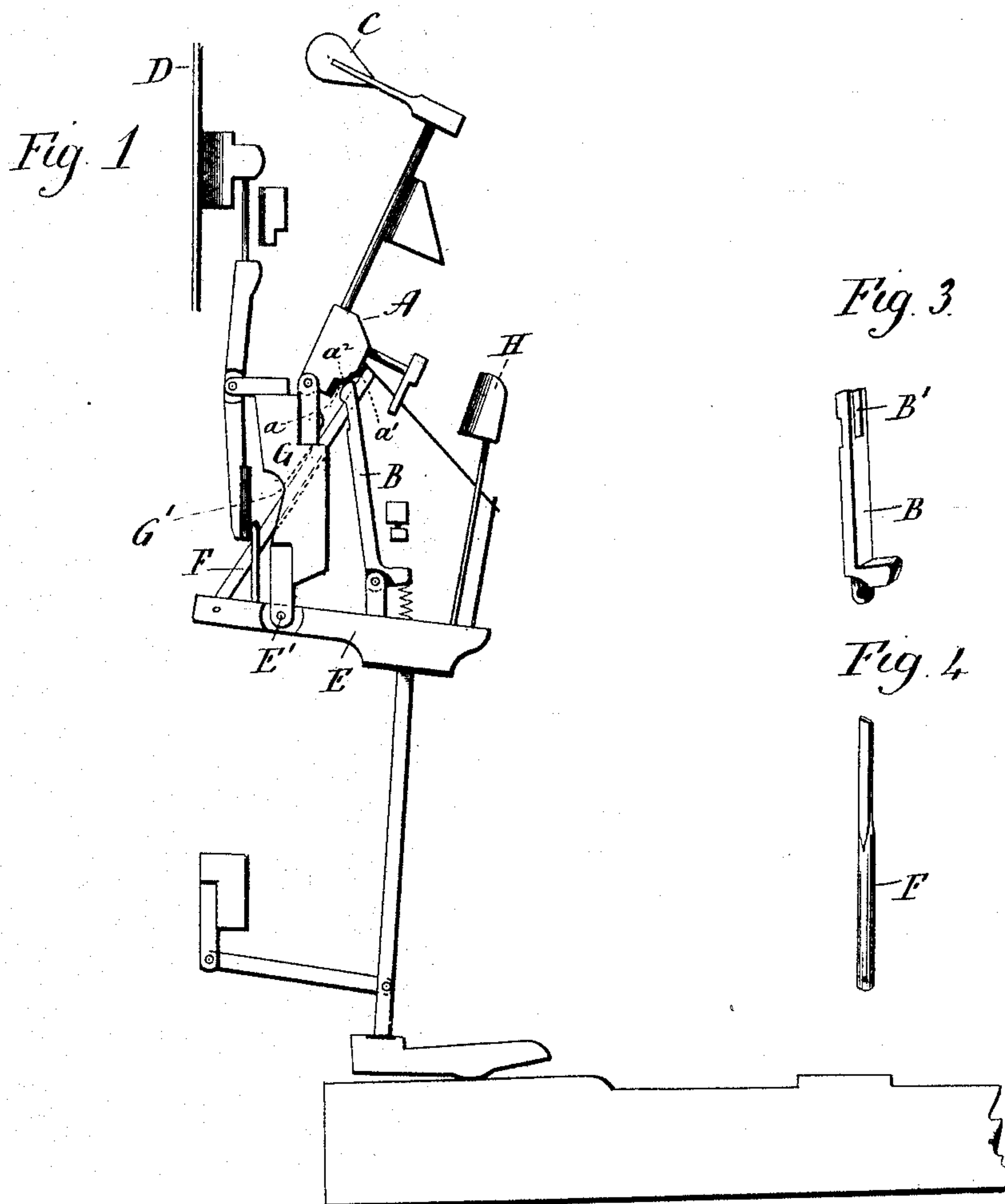
No Model.)

2 Sheets—Sheet 1.

F. A. GUTH.  
PIANO ACTION

No. 491,308.

Patented Feb. 7, 1893.



Witnesses:  
J. H. Shumway  
Lillian D. Kellogg

Frederick A. Guth.  
Inventor.  
By Atty.  
Earle Seymour

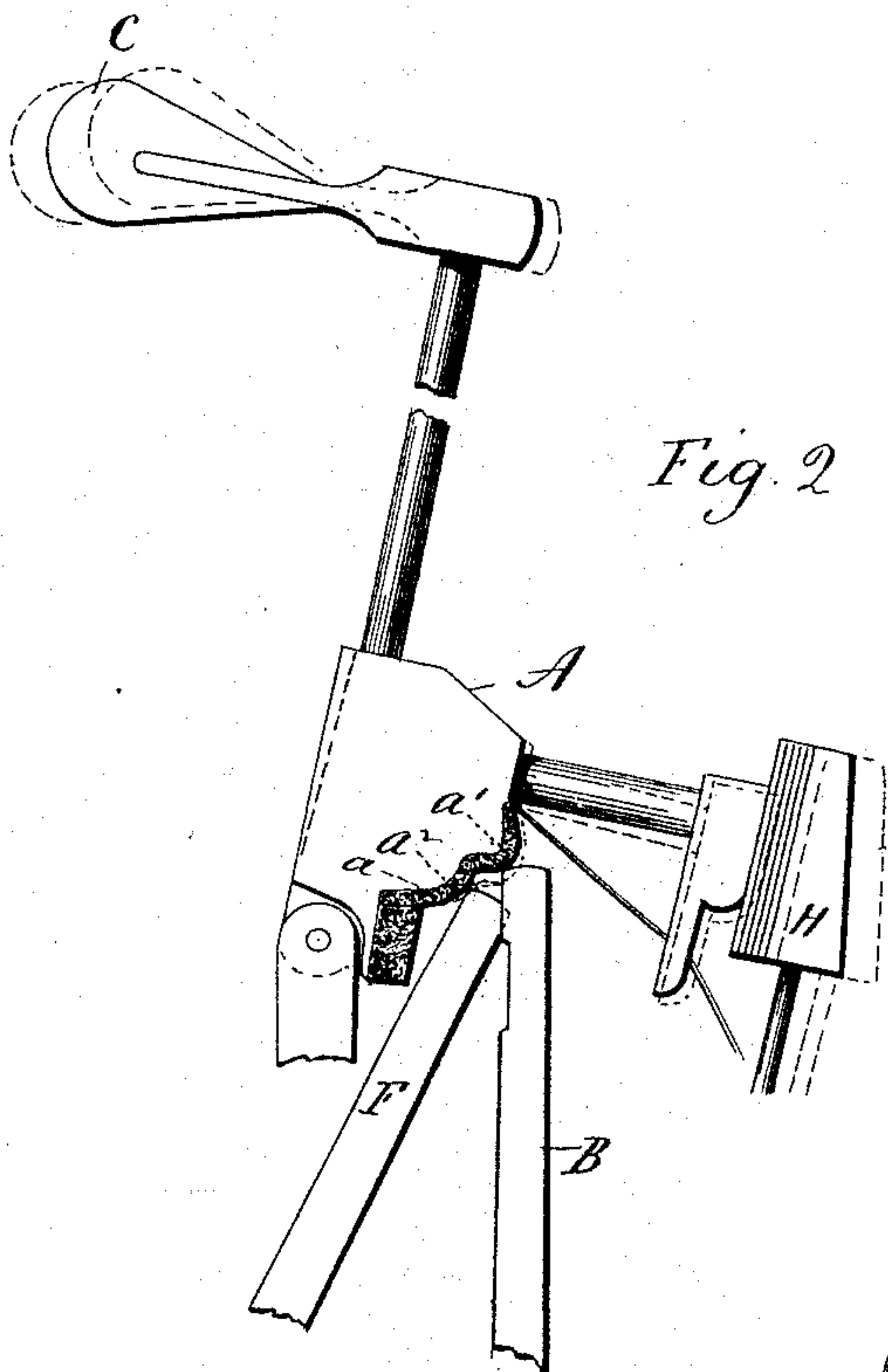
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*Fig. 2*

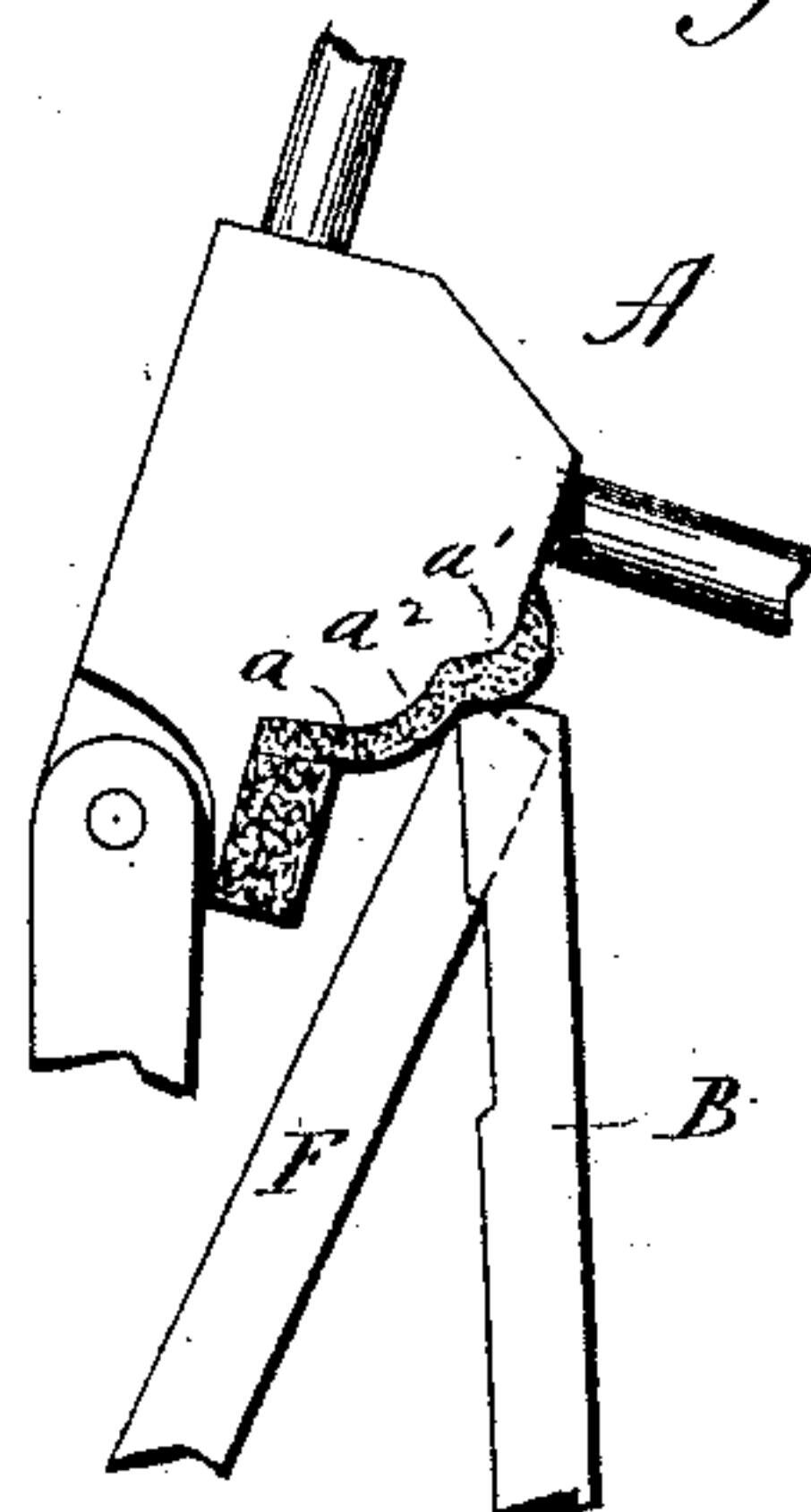


Fig. 2 <sup>a</sup>

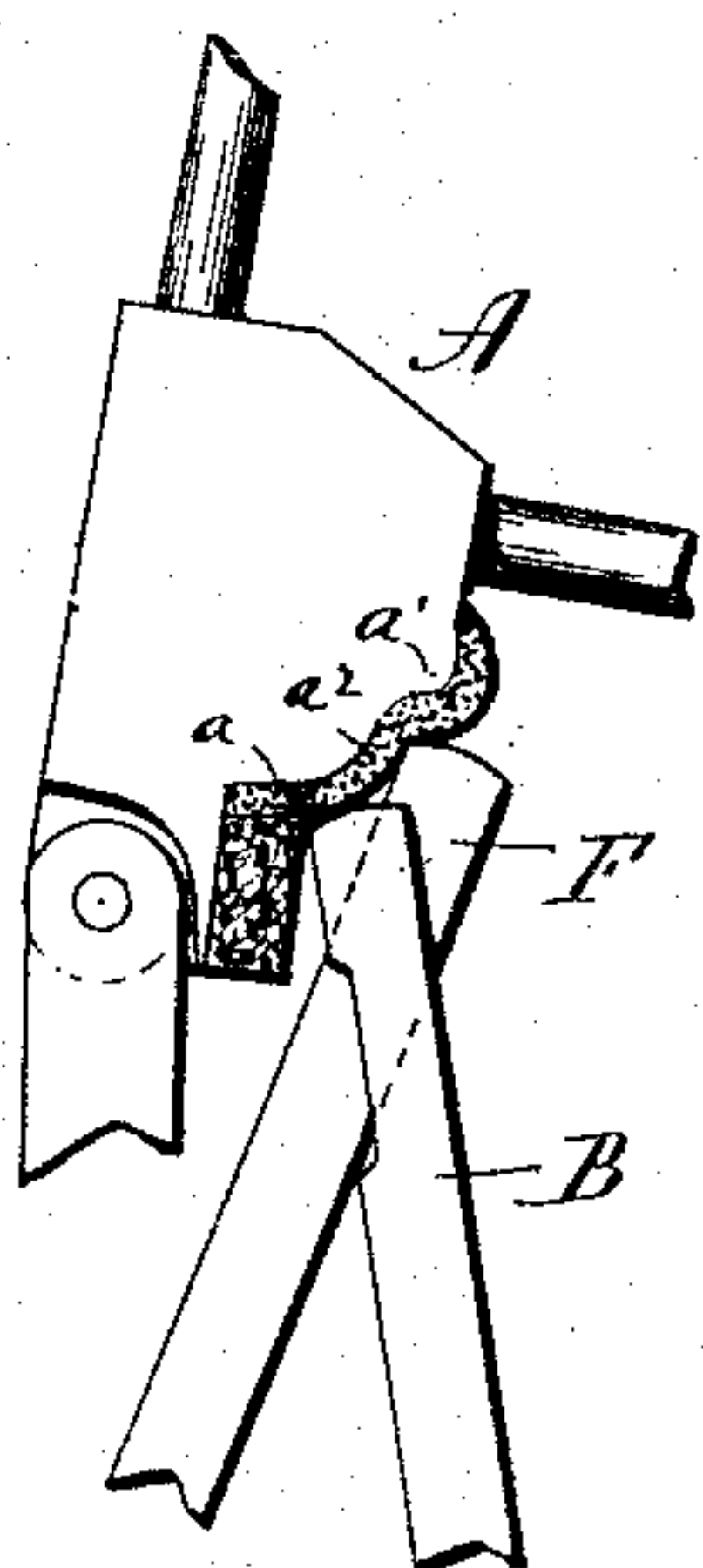


Fig. 2<sup>b</sup>

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# UNITED STATES PATENT OFFICE.

FREDERICK A. GUTH, OF WAVERLY, OHIO, ASSIGNOR OF ONE-HALF TO  
GUSTAV H. OHLSTROM, OF SHELTON, CONNECTICUT.

## PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 491,308, dated February 7, 1893.

Application filed August 30, 1892. Serial No. 444,499. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK A. GUTH, of Waverly, in the county of Pike and State of Ohio, have invented a new Improvement in Piano-Actions; and I do hereby declare the following, when taken in connection with accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a view partly in section and partly in elevation, of a piano-action constructed in accordance with my invention: Fig. 2, a broken view in side elevation, showing the position of the hammer, and the two flies, when the key is fully down, or at the limit of its depression. Fig. 2<sup>a</sup>, a similar though less comprehensive view, showing the change in the positions of the flies consequent upon the first movement of the key toward recovery, the secondary fly being brought into position to do its work. Fig. 2<sup>b</sup>, a view similar to Fig. 2<sup>a</sup>, showing a very little further movement of the key toward recovery, permitting the main-fly to fall into position to actuate the hammer again without any full recovery of the key. Fig. 3 a detached perspective view of the main fly. Fig. 4, a similar view of the secondary fly.

My invention relates to an improvement in actions for upright pianos, the object being to improve the tonal brilliancy of this class of instruments by a very simple and inexpensive construction.

With these ends in view, my invention consists in the combination with a hammer-butt constructed at its lower end with an upper and a lower shoulder, of a fly located below the said butt, in position to co-act with the said lower shoulder in throwing the hammer, a secondary fly co-acting with the upper shoulder, and a rocker having the lower ends of the said flies pivoted to it on opposite sides of its fulcrum.

My invention further consists in certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

In the accompanying drawings I have shown a view partly in section and partly in eleva-

tion, of an action of approved construction, for an upright piano. Inasmuch, however, as this action is well known, and will be readily understood by those familiar with this art, I will not describe it further than is necessary in the disclosure of my present invention.

Under my invention the hammer-butt, A, is constructed at its lower end with a shoulder *a*, which is old, and with an upper shoulder *a'*, the said shoulders being separated by a beveled or inclined surface *a*<sup>2</sup>, which merges into the lower shoulder *a*. A fly B, co-acting with the lower shoulder *a*, in the usual manner, for giving the hammer C the impulse by which it is thrown against the string D, is pivoted at its lower end to the outer end of the rocker E, which is of the usual construction. The upper end of this fly is bifurcated to form an open slot B', which receives the narrow upper end of an auxiliary or secondary fly F, which plays through the said slot, and co-acts with the upper shoulder *a'* of the hammer-butt, in momentarily sustaining the hammer in an intermediate position, giving the main fly B, an opportunity of resuming its place under the lower shoulder *a*, as will be described later on. The said auxiliary fly F, is pivoted at its lower end to the inner end of the rocker E, at a point on the opposite side of the fulcrum E' thereof, from the pivotal connection of the main fly B, with the said rocker. As herein shown, the action-rail G, is provided with an inclined transverse opening G', for the said auxiliary fly to play through. I do not, however, limit myself to constructing the action-rail in this manner for securing a passage for the secondary fly, for it might be made in some other way, as for instance, in longitudinal braced sections; or the parts might be constructed and arranged so that the secondary fly would not be obliged to be passed through the action-rail.

The secondary fly is brought into play for securing greater tonal brilliancy for the piano, particularly when the keys are struck so rapidly that they do not have time to fully return to their normal positions, as for instance in the action of trilling.

The operation of my improved construction will be understood by reference to Figs. 2, 2<sup>a</sup>



and 2<sup>b</sup> of the drawings. Fig. 2 represents the positions of the hammer and flies after the key has been struck, and while it is still in its lowest or depressed position, the hammer being caught on its rebound by the back-check H. Now when the key is relieved of pressure, and allowed to rise a little, or begin its recovery, the consequent movement of the rocker will cause the main fly and the back-check to move downward, and the hammer which is thus relieved of support, will move slightly outward, as shown by the broken lines to the right of the full lines in the said figure of the drawings. When, however the fly and back-check are being moved downward by the depression of the outer end of the rocker, the elevation of the inner end thereof is moving the secondary fly upward, and its upper end is soon engaged with the upper shoulder of the hammer-butt, as shown by Fig. 2<sup>a</sup>, which also shows a slight forward movement of the main fly. The described movement of the rocker continuing, the secondary fly moves the hammer slightly forward into the position in which it is shown by the broken lines at the right of the full lines in Fig. 2 of the drawings. This forward movement of the hammer permits the main fly to fall inward under the lower shoulder of the hammer, as shown by the broken lines in Fig. 2<sup>b</sup> of the drawings, whereby the said main fly is in position to effectively operate the hammer again, although the hammer has not, since its last operation, completed a full movement, and although the key has not been allowed to fully recover. If, now, the key is depressed again from its partially recovered position, a clear note may be sounded on the string, and this may be repeated any number of times without ever allowing the key to fully recover.

In upright pianos as ordinarily constructed, trilling and other rapid movements cannot be executed with rapidity without a loss of tonal brilliancy, on account of the fact that to secure a distinct quality of tone time enough must be allowed between every impact of the hammers on the strings for the former to fall fully back into their normal positions as shown by Fig. 1 of the drawings. My secondary fly as above described, provides for catching the hammer in an intermediate position, and holding it there while the main fly resumes its position under the lower shoulder of the hammer, which it will do even if the key is not allowed to fully recover.

It will be readily understood, then, that by providing for a proper and rapid action of the hammer when the key is not allowed to fully recover, I am enabled to secure an upright piano on which compositions requiring

great rapidity of execution may be performed without a loss of brilliancy and clearness.

I would have it understood that I do not limit myself to the exact construction as herein shown and described, but hold myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of my invention.

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

1. In a piano-action, the combination with a hammer-butt constructed at its lower end with an upper and a lower shoulder, of a fly located below the said butt in position to co-act with the lower shoulder thereof, a secondary fly co-acting with the said upper shoulder, and a rocker having the lower ends of the flies pivoted to it on opposite sides of its fulcrum, substantially as set forth.

2. In a piano-action, the combination with a hammer-butt constructed at its lower end with an upper and a lower shoulder, of a fly located below the said butt, co-acting with the lower shoulder thereof, and having its upper end bifurcated; a secondary fly extending at its upper end through the bifurcated upper end of the main fly to co-act with the upper shoulder of the butt, and a rocker having the lower ends of the said flies pivoted to it on opposite sides of its fulcrum, substantially as set forth.

3. In a piano-action, the combination with a hammer-butt constructed at its lower end with an upper and a lower shoulder, of a fly located below the said butt in a position to co-act with the said lower shoulder, a secondary fly co-acting with the said upper shoulder, a rocker having the lower ends of the flies pivoted to it on opposite sides of its fulcrum, and an action-rail constructed to permit the secondary fly to play through it, substantially as set forth.

4. In a piano-action, the combination with a hammer-butt constructed at its lower end with an upper and a lower shoulder, of a fly located below the said butt, in a position to co-act with the said lower shoulder, a secondary fly co-acting with the said upper shoulder, a rocker having the lower ends of the flies pivoted to it on opposite sides of its fulcrum, and an action-rail having a transverse opening formed in it to permit the secondary fly to play through it, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FREDERICK A. GUTH.

Witnesses:

DAVID LORBACH,  
FREDERICK GUTH.