

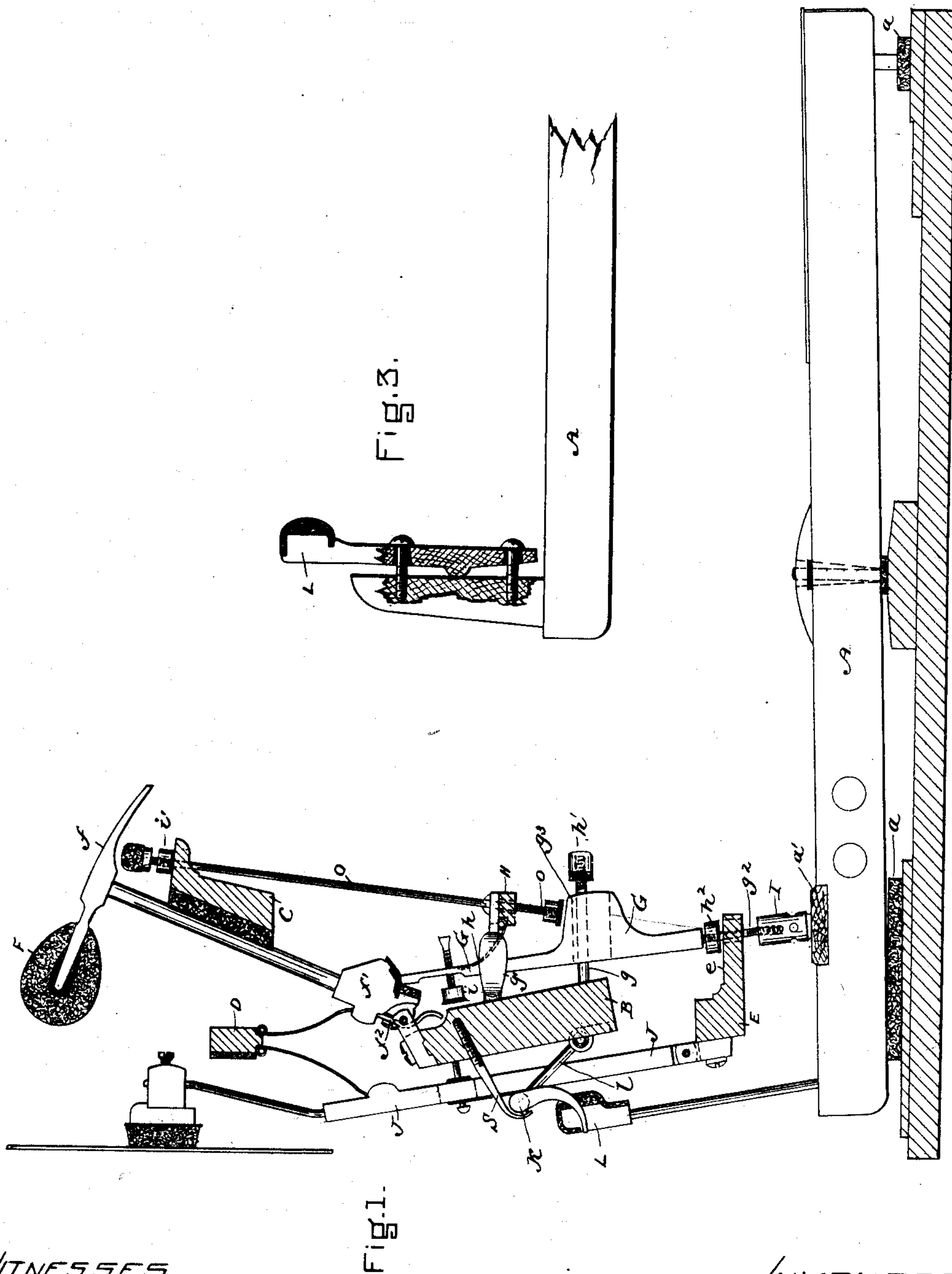
(No Model.)

2 Sheets—Sheet 1.

A. D. DIMICK.
PIANO ACTION.

No. 432,516.

Patented July 22, 1890.



WITNESSES.

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INVENTOR

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By Lennie G. Goedoberg

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Fig. 4.



Fig. 5.

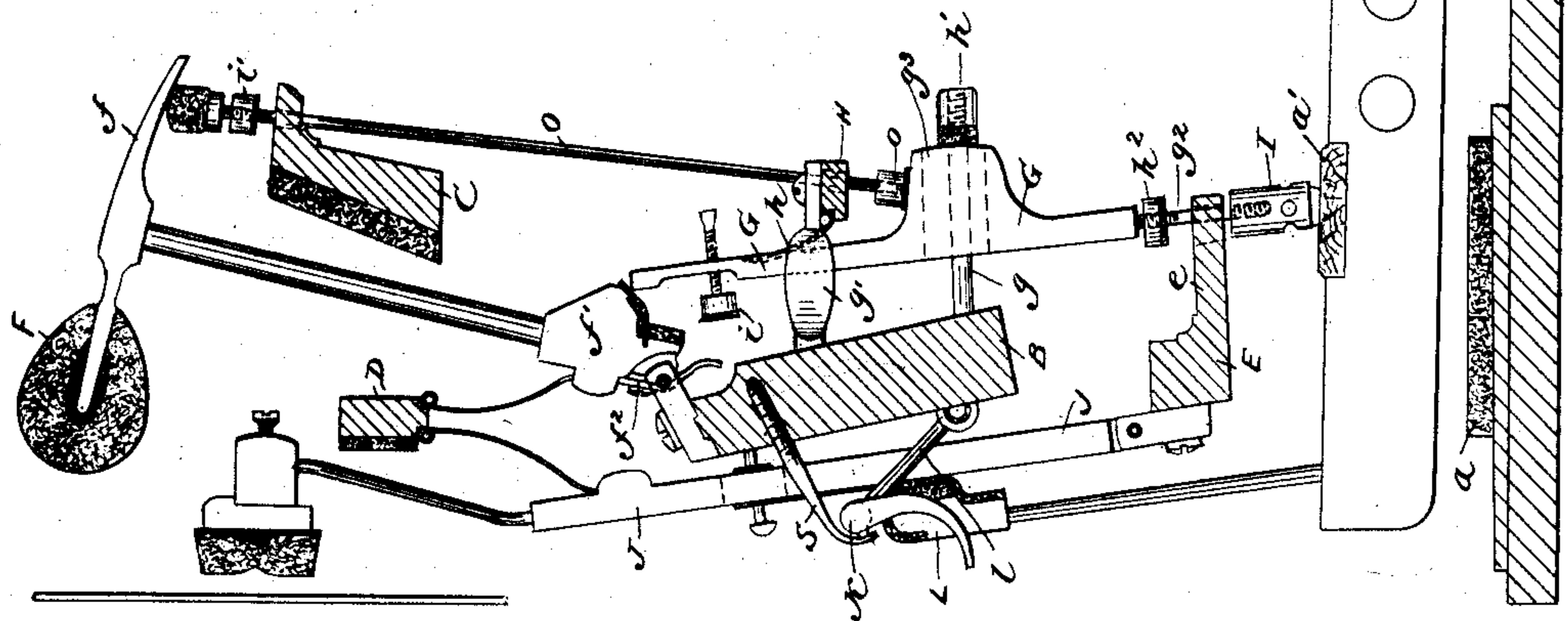
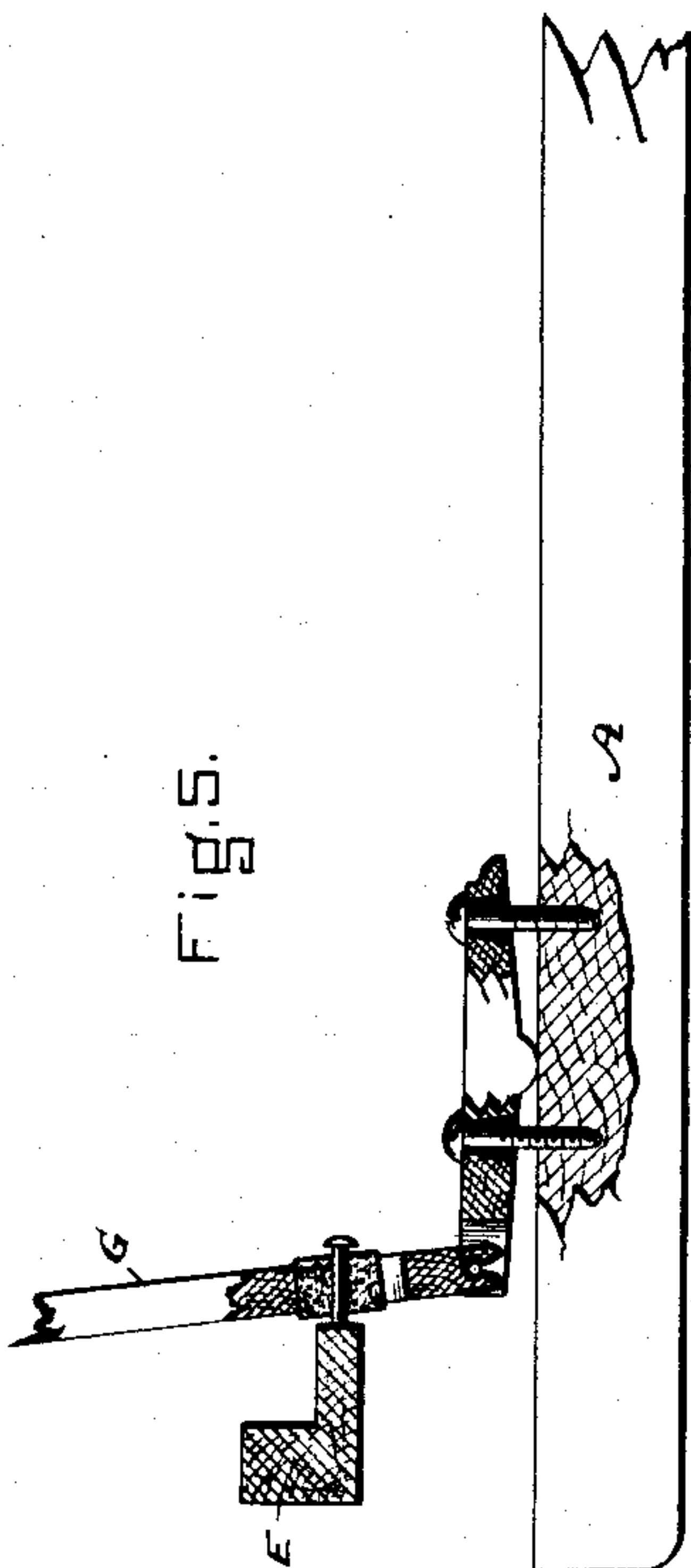


Fig. 2

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PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 432,516, dated July 22, 1890.

Application filed January 30, 1890. Serial No. 338,596. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS D. DIMICK, a citizen of the United States, residing at Wakefield, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Piano-Actions; and I do hereby 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.

The invention relates to pianos in general, and has particular reference to the mechanism whereby the hammers are caused to deliver the blow upon the strings, technically known as the "action."

It relates especially to vertically-arranged actions designed for use in upright pianos, and has for its objects to cheapen the cost of manufacture, to simplify the construction, to reduce the number of parts, to avoid the use as far as possible of objectionable pivots, and to secure a more direct and positive action of the several pieces composing the action, whereby friction is reduced to a minimum and a noiseless, easy, and sensitive operation of the parts is obtained, and firmness and precision of action are secured, together with the requisite capability for quick repetition of the stroke of the hammer.

To this end the invention consists in the construction and arrangement of parts hereinafter described and claimed, embodying as distinguishing characteristics a jack, which, instead of being pivoted upon a bed or jack-lever interposed between it and the key, is arranged to slide bodily up and down in or upon suitable guides on the action-rail, and has an adjustable knob on its lower end, the jack being operated by a direct connection with the key; a damper, which, instead of being pivoted midway of its length and operated by a lifter on the jack bed or lever acting between the damper-lever and the action-rail, is pivotally mounted at its lower end and operated by a lifter on the key acting on the opposite side of the damper-lever from the rail; an adjustable stop for the lifter-rod, whereby the amount of liberty or clearance between it and the damper-lever may be regulated in connection with a lifter-rod acting on the outer

side of the lever; a back-check for the hammer, which, instead of being mounted on the jack bed or lever and acting upon a buffer or bunter projecting from the hammer-butt near its pivot, is arranged to slide in bearings in the action-rails, and acts upon an extension of the hammer-head, being actuated by the upward movement of the jack itself, and also in minor features and details of construction which will be more particularly hereinafter pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figures 1 and 2 are side views of the action, (the rails only being in section,) the parts being in different positions. Figs. 3 and 5 are detail views of modifications of certain of the connections, and Fig. 4 a detail of an improved key-pad.

Like letters designate corresponding parts in the several figures.

A is the key, pivoted, as usual, about midway of its length, and provided under its ends with pads *a*, which may be the ordinary pieces of cloth or felt, as shown in Figs. 1 and 2; or, if preferred, of the kind shown in Fig. 4, to be hereinafter described.

B is the main rail of the action; C, the hammer-rail; D, the damper-check rail, to which the usual hammer and damper-springs are attached; E, the lower rail, to which the damper-lever is pivoted, and which has an integral or attached flange *e* to guide and help sustain the jack, and H a light rail forming a guide for the lower end of the hammer-check rod and carrying the jack-springs.

F is the hammer-head, provided with the extension *f*, for a purpose to be hereinafter described, the hammer being pivoted at its butt *f'*, by means of the metal clip *f*², to a flange on the top edge of the main action-rail, said clip passing around the pivot-pin in the flange, this clip being, in this invention, given the particular construction shown, for a purpose presently to be described.

G is the jack, which, as above stated, instead of being L-shaped, is made of a straight continuous piece, preferably widened out at some point intermediate of its ends, as shown at *g*³, and slotted at that place, (this slot having, preferably, like the others, a soft bushing,) so as to take over and be supported

mainly by a pin g , projecting from the action-rail, so as to be capable of a sliding movement up and down under the action of the key. The lower end of the jack, instead of
 5 being pivoted to the usual jack bed or lever, is passed through a bushed slot in the lower rail E and stepped directly upon the key itself, thereby dispensing entirely with the jack-bed or other intermediate mechanism
 10 between the jack and the key and obtaining a more direct and positive thrust upon the hammer with a quicker response to the touch on the key. The upper part of the jack extends up between the action-rail B and the
 15 light rail II, which is carried by studs g' , projecting from the main rail, and forms the lower guide-bearing for the sliding hammer-check rod. The nose or upper end of the jack is held normally forward, so as to en-
 20 gage the padded shoulder on the hammer-butt by the expansion-spring h , fixed to the rail H, though it may be similarly operated by a small contraction-spring fastened at one end to the opposite side of the jack and se-
 25 cured at the other to the action-rail.

In order to trip the jack to permit the return of the hammer after the delivery of the blow, I use a let-off composed of an adjustable stop i , whose stem is screwed into the
 30 jack near its upper end, in connection with a tang or lug on the hammer-butt. I conveniently make use of the clip f^2 , by which the butt is pivoted on the pin of its flange, to form this tang or lug. The clip is therefore longer
 35 than usual, and is shaped as shown, so that as the hammer moves forward it will at the proper time engage the stop i in the jack and trip the latter. By making the stop adjustable the point in the movement of the ham-
 40 mer where the tripping takes place may be regulated with exactness.

To prevent the jack when tripped from getting farther away from under the shoulder of the hammer-butt than is necessary, thereby
 45 causing excess of liberty or movement of the jack and requiring extra work for its returning spring h , as well as to accurately control this liberty of the jack, I provide the pin g with an adjustable padded head or button h' .
 50 Upon the threaded rod g^2 in the lower end of the jack, where it passes through the slot in the rail E, I place another adjustable button h^2 , which limits the downward movement of the jack and prevents the action falling when
 55 the key is removed.

The connection between the key and the lower end of the jack may be made in different ways, of which I have shown two in the drawings. In Figs. 1 and 2 there is let into
 60 the key a piece of hard wood a' , having in its upper surface a hemispherical recess, into which fits a rounded knob, of rubber or other suitable material, on the lower end of the button I, which, moreover, is made adjustable by
 65 screwing on the rod g^2 to effect alterations in the length of the jack. It is obvious, how-

ever, that the parts might be reversed—that is, the knob be arranged on the piece a' and the hemispherical recess in the end of the button I.

Fig. 5 shows a modification of the above-described arrangement. In this form the screw-rod and its button and adjustable stop are dispensed with, and the lower part of the jack is provided with a key-hole slot taking
 75 over a headed pin, which takes the place of the flange on the rail E. The end of the jack is forked, and straddles a pivot-pin in a rocker mounted on the key. Other modifications will suggest themselves to the skilled operator.

As before stated, the damper-lever J, instead of being pivoted midway of its length and operated by a lifter mounted on the jack-bed and acting between the lever and the rail, is pivotally mounted at its lower end upon the rail
 85 E, preferably by a flange secured thereto, and actuated by a lifter L, mounted on the key and bearing on the outside of the lever at about the middle of its length, resulting in a direct lifting of the damper by the key, giving
 90 a quicker, easier, and surer action. This lifter is shown in Figs. 1 and 2 as a pad on the upper end of a vertical rod fixed in the key. The pad may, however, be fixed on the
 95 upper end of a rocker, as shown in Fig. 3, and be adjustable in that way instead of by bending the rod, as in the other construction, or it might even have an adjustable button, like that used in the jack at i . The lever is
 100 guided near its upper end by a headed pin from the action-rail passing through a key-hole slot in the lever. By unscrewing the flange at the foot of the lever and dropping it slightly it may be taken off of the pin.

Instead of mounting the lifter-rod K between the damper-lever and the rail, which
 105 arrangement requires a considerable cutting away of the latter and gives much trouble and annoyance in getting at the parts to adjust the liberty or clearance of the rod, I ar-
 110 range it on the outer side of the lever and connect it with the action-rail by pivoted links l , as shown, whereby ready access is had to the rod, and the rail, not being cut away, is strengthened.

To limit the outward movement of the rod and to adjust it for the purpose of giving it the proper clearance, I provide an adjustable catch or hook-shaped stop S, which is screwed
 120 into the action-rail and may be adjusted by turning in or out, so as to set the bar at a suitable distance from the damper-lever to permit the proper action of the damper on the strings.

The back-check for the hammer has heretofore generally been mounted on the jack
 125 bed or lever and arranged to act on a buffer projecting from the hammer-butt. In this invention it is, however, arranged in sliding bearings in the action-rails, and consists of a
 130 rod O, whose padded upper end extends above the hammer-rail and plays in the path of the

projection f on the hammer-head, and whose lower end extends down below the rail H , where it is provided with a padded foot which rests on a shoulder on the jack formed by the widened slotted part g^3 . Upon the threaded upper part of the check-rod is an adjustable stop-button i' to limit its downward movement, and the check-buffer at the top is preferably adjustable also. The under side of the hammer-extension may be faced with leather or felt, if desired, to afford a better hold for the check, but it is hardly deemed essential. The shape and structure of the extension may be varied within wide limits, as I do not wish to be confined to the shape shown. Any other form or configuration may be resorted to which experience may demonstrate to be more efficient or desirable.

Figs. 1 and 2 show the form of key-pad in common use, being a piece of thick felt. This is somewhat objectionable on account of being affected unfavorably by atmospheric changes, thereby interfering with the free and easy action of the key.

In Fig. 4 I show a form of pad or rest which is not affected by moisture or temperature. It consists of a rubber cord or rod c , set into a groove in the piece d and covered by a strip of light felt or any suitable cloth b . While I have shown it in connection with the key, it could be used, if desired, on the hammer-check rail or other point where a check-pad of this character is desired.

The construction of my improved action being as above described, the operation is generally as follows: The depression of the key raises the jack, the damper-lift, and the hammer-check, freeing the damper from contact with the strings, throwing the hammer forward to deliver the blow, and carrying the hammer-check into a position where it will be engaged by the hammer-head projection after the blow has been given, in order to prevent the rebound of the hammer. As the hammer moves forward, the tang or lug f^2 moves in the opposite direction, and striking the stop i on the jack trips the latter, allowing the hammer to return. The jack-spring h acts to restore the jack to its normal position promptly, whereby quick repetitions of the blow may be given with less than the full stroke of the hammer.

It is apparent that many of the details of the construction and arrangement of the several parts of my action may be considerably varied; also, that some of the features may be used without employing the whole.

It is to be understood that the rockers shown in the modifications in Figs. 3 and 5 are fixtures on, and, so far as this invention goes, are parts of the key.

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

1. In a piano-action, the combination of the main action-rail, the lower rail, the jack sliding in suitable guides or ways on the rails,

and the key, the jack resting directly upon the key and having an adjustable knob on its lower end, substantially as described.

2. The combination of the key, the pivoted hammer, the sliding jack, the jack-trip consisting of the adjustable stop in the jack and the tang on the hammer-butt and the jack-spring, the jack arranged to slide endwise on suitable guides in the action-rail, the spring arranged to restore the jack to place after it has been tripped, and means to limit the lateral movement of the jack, substantially as described.

3. The combination of the main action-rail, the lower rail, the pin from the former and the slot in the latter, the sliding jack having a vertical slot in its body taking over the pin and the lower end of the jack playing in the slot in the lower rail, adjustable buttons on the lower end of the jack, and the pin in the main rail, substantially as described.

4. The combination of the main and lower rails, the pin from the former and the slot in the latter, the sliding jack having a slot taking over the pin and having its lower end playing in the slot in the lower rail, the pivoted hammer, and the sliding hammer-check rod, the lower part of the jack being provided with an adjustable stop bearing upon the lower rail to prevent the action falling too low, substantially as described.

5. The combination of the main rail, the hammer-flange secured thereto, and the hammer-butt, the latter connected to the pivot-pin in the flange by the plate f^2 , passing around the pin and having its end elongated and bent backward, as shown, to act as the jack-trip, substantially as described.

6. The combination of the key and the jack, the key having a piece of hard wood a' let into its upper surface and having a hemispherical recess, and a rounded knob on the end of the jack seated in the recess, substantially as described.

7. The combination of the key, the damper-lever pivoted at its lower end to one of the action-rails, and the damper-lift mounted on the key and acting upon the outer or back side of the lever, substantially as described.

8. The combination of the pivoted damper-lever and the lifter-rod, link connected to the action-rail and lying outside or back of the damper-lever, substantially as described.

9. The combination of the pivoted damper-lever, the lifter-rod, link connected to the action-rail and lying outside of the damper-lever, and an adjustable catch to set the rod in proper position for the action of the damper, substantially as described.

10. The combination of the hammer-head, its extension, the sliding jack, the sliding hammer-check, and the key, the check being actuated by the jack and the latter being operated directly by the key, substantially as described.

11. The combination of the hammer-head, its extension, the jack, and the hammer-check,

the latter being arranged to be operated by the jack, substantially as described.

12. The combination of the hammer-check rail and the rail II, the hammer-head with its
5 extension, the jack, and the hammer-check rod sliding in bearings in the rails and operated by the jack, substantially as described.

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

AUGUSTUS D. DIMICK.

Witnesses:

HERBERT W. ELMORE,
J. A. GOLDSBOROUGH.