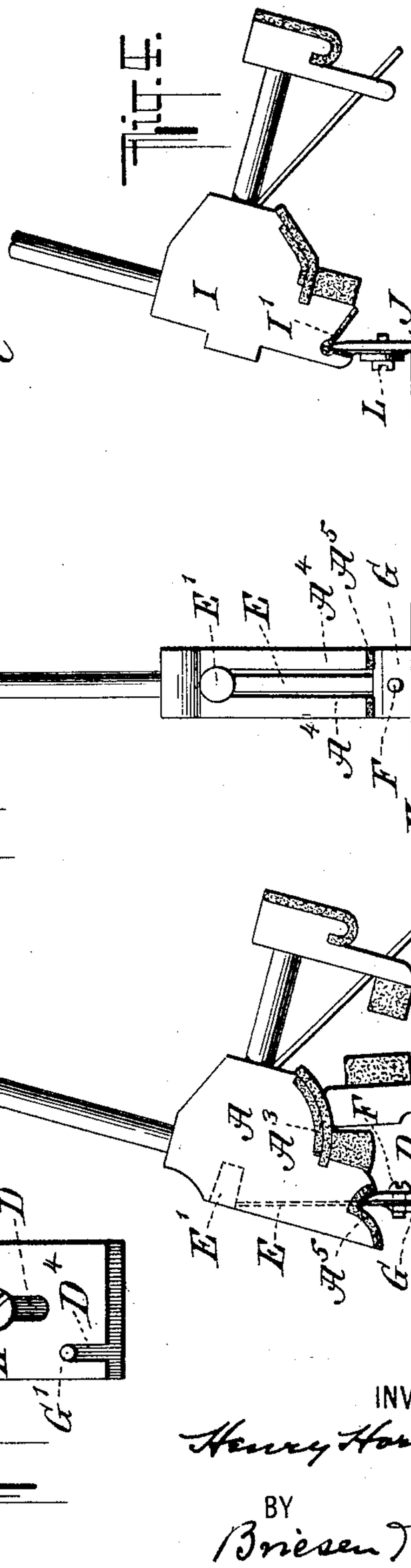
No. 776,841. PATENTED DEC. 6, 1904.

H. HORNBECK.

PIANO ACTION.

APPLICATION FILED MAR. 16, 1904.

NO MODEL. 2 SHEETS—SHEET 1.



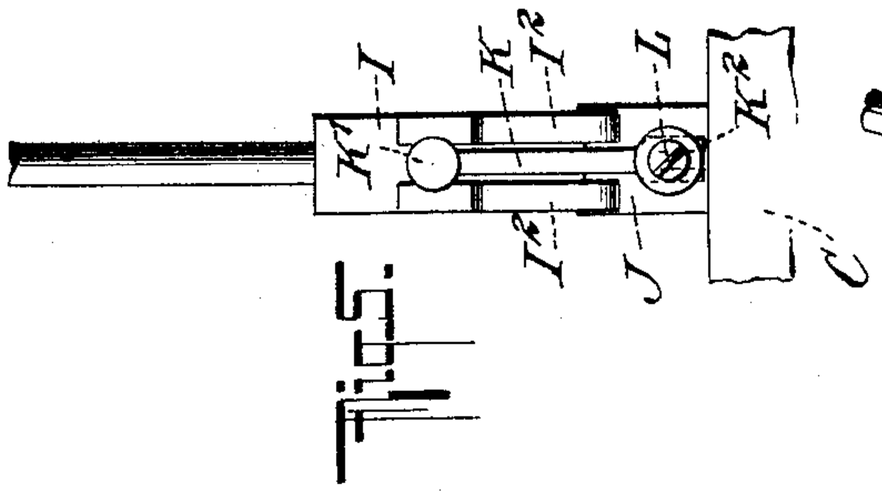


Fig. 5.

Fig. 2.

Fig. 1.

Fig. 3.

WITNESSES:

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 11.

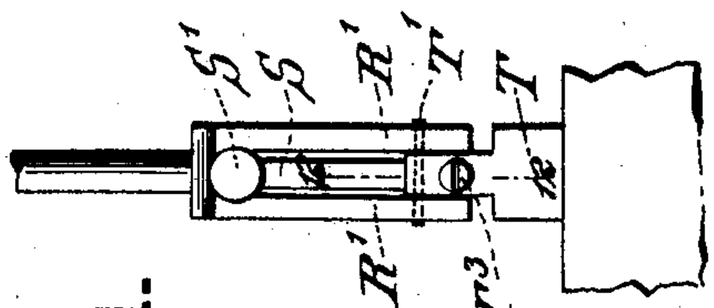

Fig. 10.

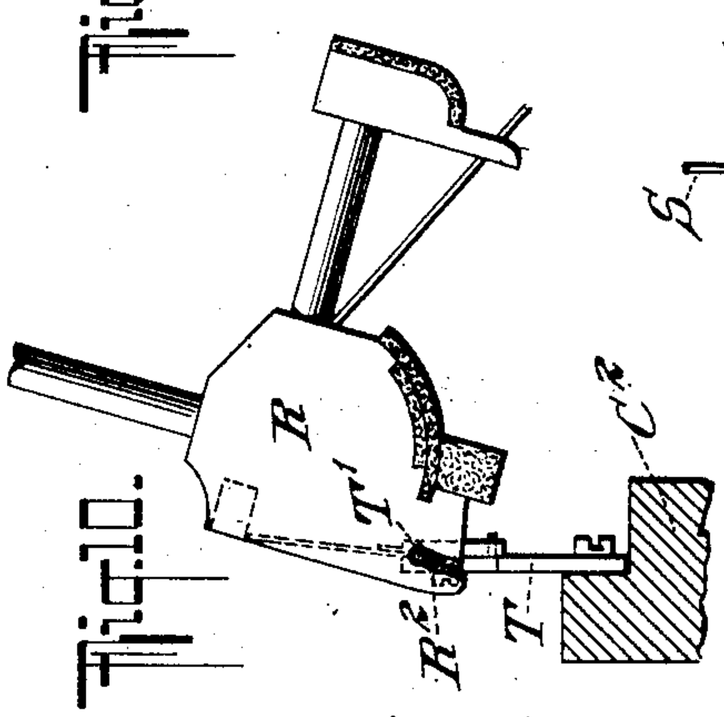

Fig. 12.

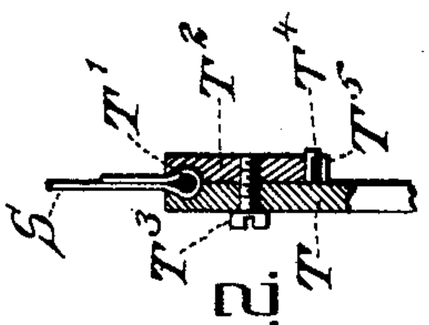

Fig. 13.

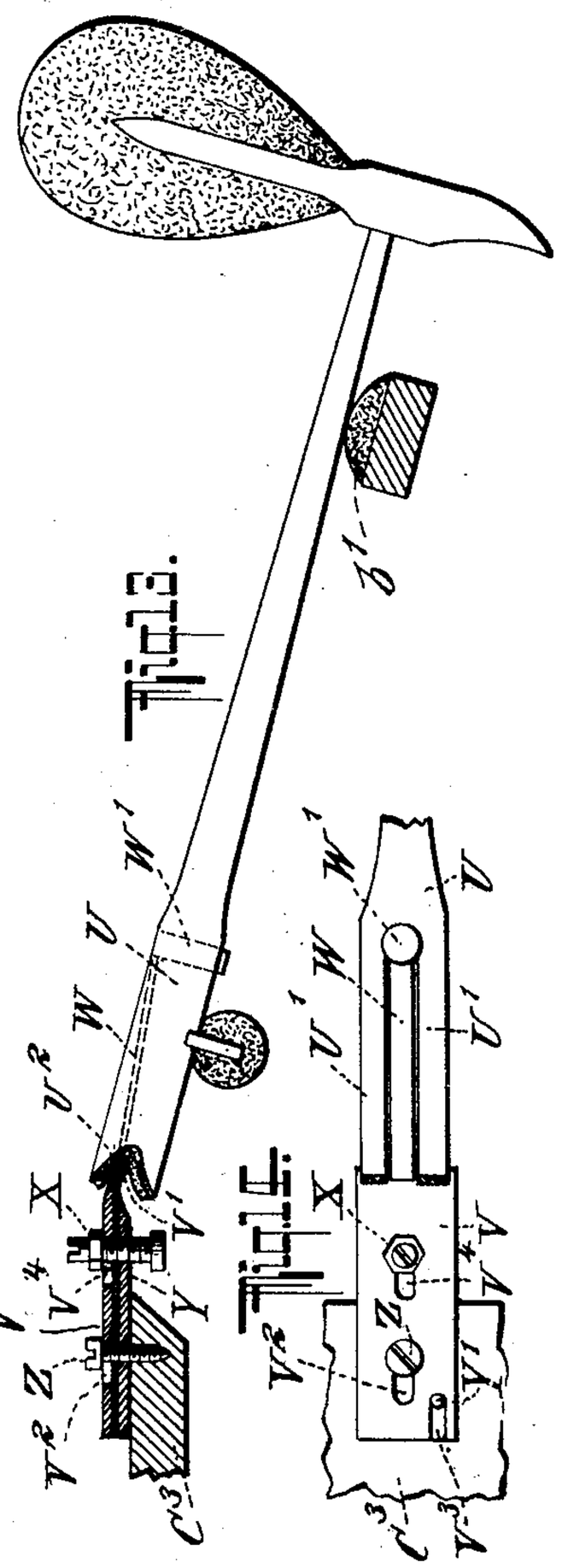

Fig. 15.

Fig. 7.

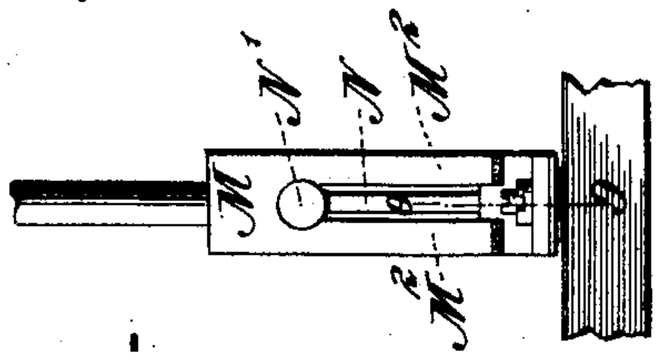

Fig. 6.

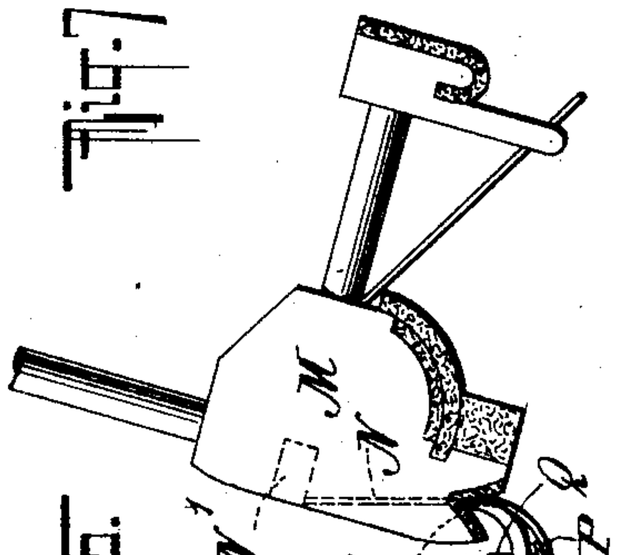

Fig. 14.

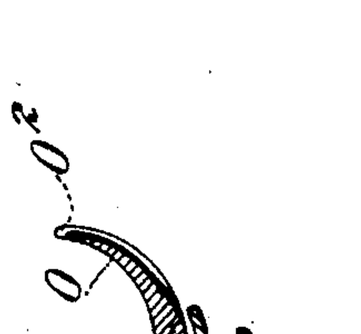

Fig. 8.

WITNESSES:

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No. 776,841. Patented December 6, 1904.

UNITED STATES PATENT OFFICE.

HENRY HORNBECK, OF ELIZABETH, NEW JERSEY, ASSIGNOR OF ONE-HALF TO ANNIE L. SEE, OF CRANFORD, NEW JERSEY.

PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 776,841, dated December 6, 1904.

Application filed March 16, 1904. Serial No. 198,336. (No model.)

To all whom it may concern:

Be it known that I, HENRY HORNBECK, a citizen of the United States, and a resident of Elizabeth, Union county, State of New Jersey, have invented certain new and useful Improvements in Piano-Actions, of which the following is a specification.

My invention relates to piano-actions, and has for its object to provide an efficient and durable device for connecting the hammers with their support and for assisting the rebound of the hammers.

My invention will now be described in detail, and the novel features will then be pointed out in the appended claims.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a side elevation of a hammer and adjacent parts constructed according to my invention. Fig. 2 is a front view of the hammer and its support. Fig. 3 is an enlarged rear view of the hammer-support. Fig. 4 is a side elevation showing another form of my invention. Fig. 5 is a front elevation of the construction shown in Fig. 4. Figs. 6 and 7 are a side elevation and a front elevation, respectively, of still another form of my invention. Fig. 8 is a perspective view of the spring used in Figs. 6 and 7. Fig. 9 is a partial sectional elevation substantially on line 9 9 of Fig. 7. Figs. 10 and 11 are a side elevation and a front elevation, respectively, of a further form of my invention. Fig. 12 is a sectional elevation on line 12 12 of Fig. 11. Fig. 13 is a sectional elevation of my invention as applied to a grand-piano action, and Fig. 14 is a partial plan of the construction shown in Fig. 13.

The forms of construction illustrated by Figs. 1 to 12, inclusive, are intended for upright pianos, while the form of construction shown in Figs. 13 and 14 is designed for a grand piano.

As illustrated by Figs. 1, 2, and 3, the hammer-butt A has a stem A′, a hammer A^2, and a felt-covered shoulder or recess A^3, adapted to be engaged by the fly or jack B, which throws the hammer to the striking position in any approved manner.

My invention relates to the connection of the hammer, and especially the hammer-butt A, with the stationary support, generally in the nature of a rail C. According to my invention that portion of a hammer-butt which is toward the support C is forked, as shown at A^4 in Fig. 2, and is provided at the end of the forked portion with an angular recess A^5, preferably covered with felt. This angular recess is adapted to receive a fulcrum member D, the upper portion of which is preferably bifurcated, as shown at D′ in Fig. 3, and curved, as shown in Fig. 1, corresponding to one wall of the angular recess A^5. The upper edge of the fulcrum member D rests in the corner of the recess A^5 and forms a fulcrum on which the hammer swings. Between the fork members A^4 and D′ extends a spring E, the upper end of which is secured to the hammer-butt A in any suitable manner—as, for instance, by means of a lead plug E′—while the lower end of the spring is secured to the fulcrum member D by means of a screw F, which also connects said fulcrum member with a stationary bracket or so-called "flange" G, secured to the support C by means of a screw H.

In order to adjust the fulcrum member D vertically to compensate for wear of the felt engaging its upper edge, the openings D^2 D^3, through which screws F H extend, may be elongated, as shown in Fig. 3, and a pin G′ may be projected from the bracket or flange G to engage a notch D^4, so as to guide the fulcrum member D during its adjustment.

I prefer to so arrange the upper fastened end of the spring E relatively to the upper edge of the fulcrum member D that the spring will be approximately straight from said attached end to the point where it engages the fulcrum member at its central notch D′. The action of the spring can be regulated to a certain extent, if desired, by bending the spring more or less before it is attached to the hammer and to the fulcrum member. It will be understood that by locating the spring between the fork members A^4 the hammer is efficiently guided, and by causing the spring to pass between the fork members D′ any lateral

swaying of the spring and hammer is prevented. Furthermore, as shown in Fig. 1, I may so arrange the parts relatively to each other that as the hammer moves from the hammer-rail *b* toward the strings *a* the resistance at the fulcrum formed by the edge of member D and the felt of recess A^5 will decrease gradually and will be practically *nil* as the striking position is reached. The rebound of the hammer will be sufficient to start it on its return movement, and the spring will fully restore the hammer to its original position.

In Figs. 4 and 5 the hammer-butt I has an angular recess I′ engaged by the upper edge of the fulcrum member J, which is secured directly to the support C. The lower end of the hammer-butt is forked, as shown at I^2, and between the fork members extends the spring K, the upper end of which may be secured to the hammer-butt in the same manner as before, as indicated at K′, while the lower end of the spring has a forked portion K^2 secured to the fulcrum member J adjustably by means of a screw L. The upper edge of the fulcrum member J may be notched at the center to receive the spring K and guide it against lateral swaying in the same manner as hereinbefore explained in connection with the forked end D′ of the fulcrum member D.

In Figs. 6 and 7 the hammer-butt M, having the angular recess M′ and the fork members M^2, is connected with the spring N at N′ in any suitable manner and swings on the fulcrum member O, which is secured to the support C′, as by means of a screw O′, and the adjustment for wear and for varying the tension of the spring is in this structure effected in a somewhat different manner from that previously described. A pressure-plate P is secured to the fulcrum member O, so as to lie between said member and the spring N, and this pressure-plate may be forced away from the fulcrum member more or less by means of an adjusting-screw Q. The free edge of the fulcrum member O is in this case also notched at the center, as indicated at O^2 in Fig. 9.

In Figs. 10, 11, and 12 the hammer-butt R has a forked lower portion R′ to receive the spring S, the upper edge of which is secured to the hammer-butt at S′. The lower end of the spring is bent around a pin T′, which virtually forms part of the fulcrum member T, secured to the support C^2. The pin T′ extends laterally and engages angular felt-lined recesses R^2 in the fork portion R′ of the hammer-butt. In order to securely hold the pin T′ in its proper adjusted position, a supplementary section T^2 is connected with the fulcrum member T by means of a clamping-screw T^3. A pin T^4, engaging a slot T^5, serves to prevent the auxiliary section T^2 from turning.

In order to apply my invention to a grand-piano action, I may make use of the construction shown in Figs. 13 and 14, where the hammer-butt U has a forked end portion U′, provided at the ends with angular recesses U^2, engaged by the edge of the fulcrum member V. This fulcrum member has a central notch V′ at its free end to receive and guide the spring W, one end of which is secured to the hammer, as at W′, while the other end is secured to the fulcrum member V by means of a screw and clamping-nut X, which also secure the fulcrum member V to a bracket or flange Y, fastened to the supporting-rail C^3 by means of a screw Z. In order that the fulcrum member V may be adjusted, it is provided with slots V^2 V^4, through which the screws Z and X pass, and a recess V^3 for the reception of a pin Y′, projected from the bracket Y.

Each of the constructions above described affords an efficient and durable support for the hammer, permitting the hammer to be swung to and from its striking position without the exertion of great pressure and also allowing the tension to be readily varied and wear to be taken up.

A very important advantage of the construction herein described is the durableness of the fulcrum connection of the hammer. The pins usually employed as fulcrums cause considerable wear in the lining of the holes receiving such pins, and, moreover, it is very difficult to line such openings properly and uniformly. All these drawbacks are avoided by the use of my invention.

I desire it to be understood that instead of giving a forked construction to the hammer-butt to receive the spring and providing an edge or other projection on the stationary fulcrum member to engage the forked portion of the hammer the construction might be reversed—that is, the stationary member might be made with a fork and the hammer-butt with an edge or other projection arranged to engage the fork of the stationary member. Such reversal I consider as within the scope of my invention, and the appended claims I desire to be interpreted as covering such reversal.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a piano-action, a hammer having a forked butt-end, in combination with a spring extending within the fork of the butt-end, and a stationary support for the projecting end of the spring, said spring being secured to the hammer and forming a connection to hold the hammer against its fulcrum.

2. In a piano-action, a hammer having a forked butt-end, in combination with a spring extending within said fork and secured to the hammer, a stationary fulcrum member engaging the fork members, and means for securing the spring to said fulcrum member.

3. In a piano-action a hammer having a

forked butt-end, with angular recesses in the ends of the fork members, a stationary fulcrum member having portions located within the said recesses of the hammer and in engagement therewith, and a spring secured to the hammer and to the fulcrum member and extending between the fork members of the hammer.

4. In a piano-action, a hammer having a forked butt-end with recesses in the end faces of the fork members, a stationary fulcrum member having portions engaging the fork members at said recesses, a spring secured to the hammer and extending within the fork thereof, and means for securing the projecting end of the spring to a stationary support.

5. In a piano-action, a hammer having a forked butt-end, a stationary support, a spring secured to said stationary support and to said hammer and extending between the fork members of the hammer, and a fulcrum member arranged to engage the fork members of the hammer and adjustable on said stationary support toward and from the hammer.

6. In a piano-action, a hammer having a forked butt-end with angular recesses in the end faces of the fork members, in combination with a stationary fulcrum member engaging said fork members at their recesses and provided with a central notch and a spring secured to said fulcrum member and to the hammer and extending within the notch of the fulcrum member and between the fork members of the hammer.

7. In a piano-action, a hammer having a forked butt-end with recesses in the end faces of the fork members, in combination with a spring secured at one end to the hammer and extending between the fork members thereof, and with a fulcrum member engaging the hammer at the recesses thereof, the other end of the spring being secured to said fulcrum member so as to lie in an approximately straight line between the fulcrum member and the other attached end of the spring.

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

HENRY HORNBECK.

Witnesses:

JOHN LOTKA,

OTTO V. SCHRENK.