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W. KRETER.

PIANO ACTION.

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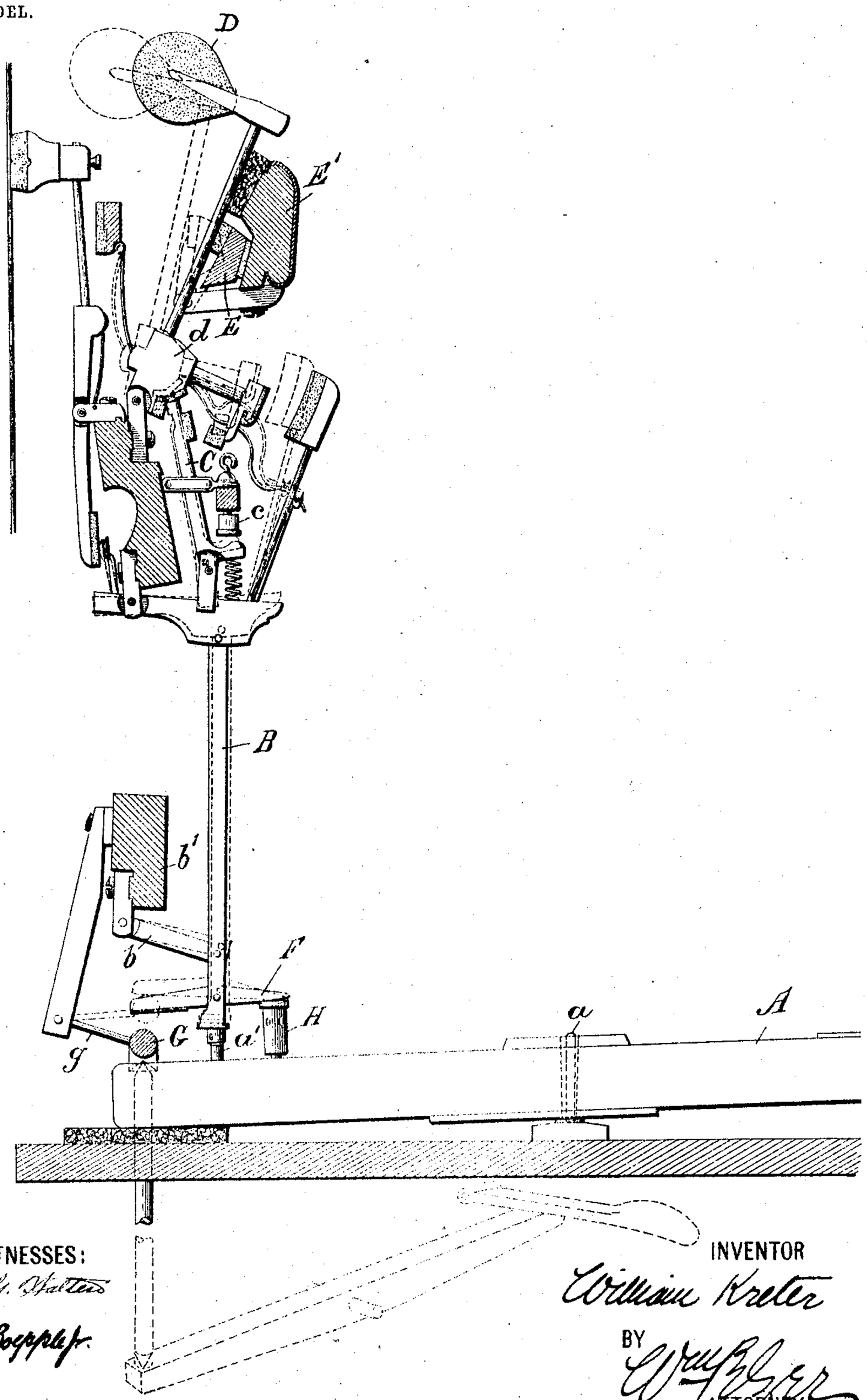
NO MODEL.



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No. 773,019. Patented October 25, 1904.

UNITED STATES PATENT OFFICE.

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PIANO-ACTION.

SPECIFICATION forming part of Letters Patent No. 773,019, dated October 25, 1904.

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To all whom it may concern:

Be it known that I, WILLIAM KRETER, a citizen of the United States, residing in the borough of Manhattan, of the city of New York, in the county and State of New York, have invented a certain new and useful Improvement in Piano-Actions, of which the following is a specification.

It is well known that in adjusting piano-actions the risers or lifting-rods (or the connection between them and the keys) are adjusted so that the jacks will be in close proximity to the hammer-butts to avoid lost motion at the butts when the keys are operated. When the hammer-rail is moved forward by the soft pedal for pianissimo effects, the hammers are carried toward the strings, and this movement removes the hammer-butts from engagement with the jacks, thereby causing considerable lost motion when the keys are operated.

The object of my invention is to overcome this lost motion and at the same time preserve the regulation of the piano-action.

With this object in view I have devised means for compensating for the forward movement of the hammers through the operation of the soft pedal, so that there will be no lost motion between the keys and hammer-butts, and which compensating means preferably operates simultaneously with the operation of the soft pedal. I further provide means for adjusting said compensating means after the action is regulated by means of the usual adjusting devices employed for that purpose—that is to say, the improved action comprehends the usual elements, including the adjusting devices for regulating the action, the compensating mechanism for preventing the lost motion, and the adjusting devices for adjusting said mechanism independently for each key and independently of the regulating adjustments, so that the adjustments of the compensating mechanism will not affect the regulation obtained by the first-named adjusting devices.

In the preferred form of my invention as applied to a well-known type of upright action the compensating mechanism consists of a series of pivoted levers, (hereinafter referred to as the "compensating" levers,) one on each lifting-rod, a horizontally-pivoted bar (hereinafter referred to as the "compensator-bar") extending over the inner ends of the keys and which is raised through the agency of the soft pedal to bring it into engagment with and raise the compensating levers simultaneously with the forward movement of the hammers by the soft pedal, so that the lifting-rods and jacks will be raised and prevent lost motion between the jacks and hammer-butts, and means for independently adjusting the operation of each compensating lever relative to its jack and independently of the means for regulating the action. The compensating levers are preferably pivoted in a straight line near the foot of each lifting-rod, and as the adjusting means for these levers I preferably provide a fulcrum for each lever, which is an adjustable post on each key, so that each compensating lever may be adjusted independently of the others relative to its own jack and compensator-bar and independently of the adjusting devices employed for regulating the action, so that notwithstanding any adjustments of the compensating devices that may be necessary the original regulation of the action will be preserved.

My invention is illustrated in the accompanying drawing, which illustrates a single key and its hammer-action with my improvement applied thereto, the solid lines representing the action when the hammer-rail is in its normal position, and the dotted lines indicating the relative positions of the parts following the simultaneous movements of the hammer-rail and compensator-bar through the operation of the soft pedal.

Referring to the drawing, A indicates the usual key working on a pivot-pin *a* and provided with a screw-post *a'*, upon which rests a lifting-rod B. This rod is hinged to the usual jack-lever carrying the spoon for operating the damper and the back catch for the hammer. The lifting-rod B is also hinged to a link *b*, which is hinged on a cross-bar *b'* and serves to hold the lifting-rod in line with the screw-post *a'* on the key.

C is a jack of ordinary construction de-

signed to strike the butt *d* of the hammer D, and *c* is the usual adjusting-button for tripping the jack after actuating its hammer. In the action illustrated in the drawing the hammer-rail consists of a movable section E and a stationary section E′, the movable section being carried by pivoted arms which are connected with the soft pedal by a rod and lever, as usual.

It will be understood that in adjusting the action shown in the drawing the adjusting-screw *a′* is set so that the end of the jack C will touch the butt *d* without raising the hammer-arm from the hammer-rail. It will be observed that when the hammer-rail E is moved forward, as shown in dotted lines, there is a considerable clearance between the end of the jack and the butt. This clearance is taken up by raising the lifting-rod B, jack-lever, and jack by means of the short lever F, pivoted near the foot of the lifting-rod B, by raising the compensator-bar G through the soft pedal. It will be understood that the connection between the bar G and the soft pedal is such that the vertical movement of the bar will be just sufficient to raise the jacks the desired distance. This bar G is carried by suitable arms *g*, pivoted at suitable points on the framework of the piano. The means for adjusting lever F to produce the proper lift of the jack to compensate for the forward movement of the hammer by the hammer-rail is an adjustable post H, having a screw working in the key A. To obtain this adjustment for each key the soft pedal is depressed, which places the various parts in the dotted-line positions, and if a jack does not properly engage its hammer-butt its respective lever F is adjusted to raise or lower the jack by readjusting the post H.

It will be observed that the adjustments of posts H do not alter the original adjustments of the hammer-butts, jacks, and rods B in regulating the action, since the adjustments between said rods and their regulating-screws *a′* are not altered by the adjustments of posts H, and hence the regulation of the action is preserved.

It will be noticed that when the parts are in the dotted-line position and the key A is depressed rod G becomes the fulcrum of lever F and post H raises its end of the lever and serves as the means for imparting the movement of the key to rod B and jack C until screw *a′* engages the foot of rod B, whereupon the upward movement of rod B is continued by the direct engagement of the foot of said rod with screw-rod *a′*.

From the foregoing it will be seen that post H constitutes the fulcrum for lever F when the soft pedal is depressed to restore the jack to its proper position relative to the hammer-butt and that while in this position rod G becomes the fulcrum for lever F when the key is depressed.

I am aware that in some piano-actions the keys are so balanced by springs or weights that when the hammers are moved forward by the hammer-rail the jacks will be caused to follow the butts and maintain engagement therewith. I am also aware that in another form of action the connection between the jack-levers and keys is such that upon the forward movement of the hammers by the hammer-rail the jack-levers will be raised correspondingly by the straps and pins connecting the butts with the jack-levers, and consequently the jacks will follow the hammer-butts; but this means is not very accurate, and, besides, the keys will drop a corresponding distance, which will affect the touch of the operator. I am also aware that in a still other form of action means has been provided for raising the jacks simultaneously with the forward movement of the hammers by the hammer-rail and which means was controlled by a bar actuated from the soft pedal. In each of these arrangements, however, no means was provided for accurately adjusting the compensating devices for each key independently of each other and without disturbing the regulation of the action to compensate for the forward movement of the hammers by the hammer-rail, and in the last-named arrangement the bar for controlling the compensating means acted similarly for each key, and no means was provided for correcting faulty construction, and even if the parts were entirely accurate when originally put in position no means was provided for readjustment to compensate for wear and warping of the wooden parts.

What I claim is—

1. In a piano-action, the combination with a hammer and its jack, the adjusting means therefor, and the hammer-rail, of means for compensating for the forward movement of the hammer by the hammer-rail to maintain the relative adjustments of the hammer and its jack, and a device for adjusting said compensating means to preserve the regulation effected by the first-named adjusting means.

2. In a piano-action, the combination with a hammer and its jack, the adjusting means therefor, and the hammer-rail, of means operated simultaneously with the hammer-rail for compensating for the forward movement of the hammer by the hammer-rail to maintain the relative adjustments of the hammer and its jack, and a device for adjusting said compensating means to preserve the regulation effected by the first-named adjusting means.

3. In a piano-action, the combination with a hammer and its jack, the adjusting means therefor, the key and the operating connection between the same and the jack-lever, and the hammer-rail, of means coöperating with the key and said operating connection to compensate for the forward movement of the hammer

by the hammer-rail to maintain the relative adjustments of the hammer and its jack, and a device for adjusting said compensating means to preserve the regulation effected by the first-named adjusting means.

4. In a piano-action, the combination with a set of hammers, their jacks and jack-levers, the separate adjusting means therefor, and the hammer-rail, of a compensator-bar, a compensating lever for each jack arranged to be engaged by said bar to shift the jacks when the hammers are moved forward by the hammer-rail, an operating connection between said compensator-bar and the pedal for operating the hammer-rail, and means for adjusting said compensating levers independently of each other relative to their jacks and said compensator-bar to preserve the regulation effected by the first-named adjusting means.

5. In a piano-action, the combination with a set of hammers, their jacks and jack-levers, the separate adjusting means therefor, and the hammer-rail, of a compensator-bar, a compensating lever pivoted on the lifting-rod of each jack-lever, and arranged to be engaged by said bar to shift the jacks when the hammers are moved forward by the hammer-rail, an operating connection between said compensator-bar and the pedal for operating the hammer-rail, and means for adjusting said compensating levers independently of each other relative to their jacks and said compensator-bar to preserve the regulation effected by the first-named adjusting means.

6. In a piano-action, the combination with a set of hammers, their jacks and jack-levers, the separate adjusting means therefor, and the hammer-rail, of a compensator-bar, a compensating lever for each jack, and arranged to be engaged by said bar to shift the jacks when the hammers are moved forward by the hammer-rail, an operating connection between said compensator-bar and the pedal for operating the hammer-rail, and means on each key for adjusting said compensating levers independently of each other relative to their jacks and said compensator-bar to preserve the regulation effected by the first-named adjusting means.

7. In a piano-action, the combination with a set of hammers, their jacks and jack-levers, and the hammer-rail, of a compensator-bar, a compensating lever pivoted on the lifting-rod of each jack-lever and arranged to be engaged by said bar to shift the jacks when the hammers are moved forward by the hammer-rail, an operating connection between said compensator-bar and the pedal for operating the hammer-rail, and an adjustable post on each key for adjusting said compensating levers independently of each other relative to their jacks and which posts serve as the fulcrums for said levers during the compensating movement.

This specification signed and witnessed this 15th day of February, 1902.

WILLIAM KRETER.

Witnesses:

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ANNA PELZER