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PIANISSIMO DEVICE FOR UPRIGHT PIANO ACTIONS.

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FIG. 1.

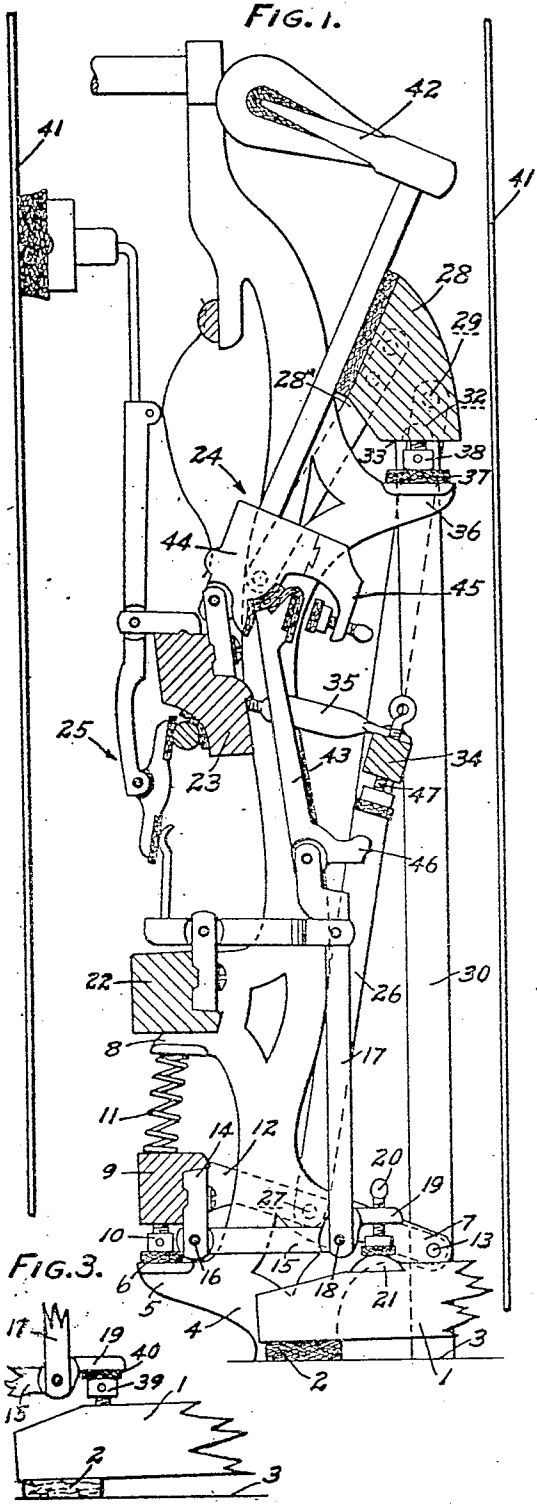
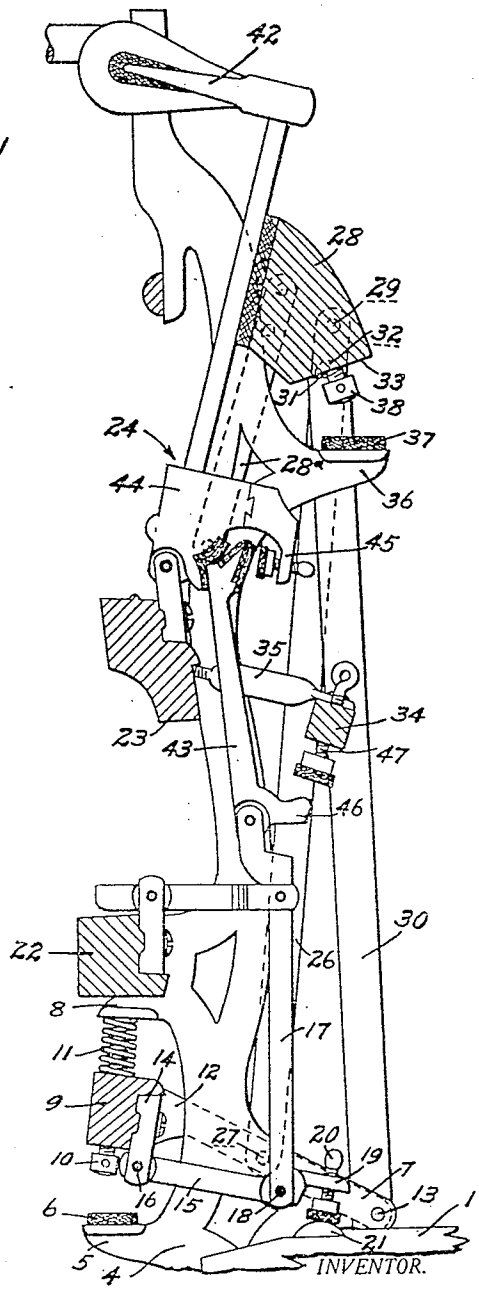


FIG. 3.

FIG. 2.



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PIANISSIMO DEVICE FOR UPRIGHT-PIANO ACTIONS.

1,353,645. Specification of Letters Patent. Patented Sept. 21, 1920.

Application filed September 9, 1919. Serial No. 322,729.

To all whom it may concern:

Be it known that I, FRANK L. GEORGE, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Pianissimo Devices for Upright-Piano Actions, of which the following is a specification.

My invention relates to pianissimo mechanism for actions for upright pianos and consists of the novel features herein shown, described and claimed.

The pianissimo pedal, generally known as the soft pedal, in all upright actions has for so many years been an imperfect quantity, and all attempts on the part of inventors throughout the world to perfect it has for so many years met with dire failure, that the entire piano world from manufacturer down through the gamut of commercialism clear on to the home of the final purchaser has long since been resigned to its fate and accepted with a sigh the inevitable. Some of the greatest inventive genius in the piano world during the past forty years has been devoted to solving the problem of the lost motion in the upright soft pedal, and while some few have met with slight success none have worked out a thoroughly practical device, so that during the past few years the world has come to look upon this imperfection as one to be endured as it could not be cured. My object is to produce a construction which will overcome the above and other objections.

After many years of close application and experiments, attended by repeated failure, I have succeeded far beyond my most sanguine hopes and have at last produced a device closely approaching perfection yet extremely simple in its design, which not only absolutely controls the lost motion in this pedal but also furnishes the means of immediately controlling, within the space of three minutes, the permanent hammer stroke. To accomplish this piece of regulation under the present forms of action construction it requires practically a whole day, as the entire action must be re-regulated, and at best it would require several hours for an expert regulator to accomplish it. I have named my invention the to-nom-e-ter, meaning tone measurer.

Figure 1 is a side elevation of a piano action having a tonometer or soft pedal construction embodying the principles of my invention, the supporting parts being shown in cross section and showing the parts in their normal positions as when the soft pedal is not operated and when the key is at rest.

Fig. 2 is a view analogous to Fig. 1 and showing the parts in their positions as when the soft pedal is operated.

Fig. 3 is a fragmentary side elevation showing a modified form of the capstan screw or adjusting screw connection between the key and the action.

The rear end of the key 1 normally rests upon the felt 2 supported by the key-frame 3. The action bracket 4 is rigidly mounted upon the key-bed 3. The lower abutment 5 extends backwardly from the lower end of the bracket 4 and a felt 6 is mounted upon the lower abutment 5. An arm 7 extends forwardly from the lower end of the bracket 4 and an upper abutment 8 extends backwardly from the bracket 4 some distance above the abutment 5.

The small action rail 9 has a capstan screw 10 tapped upwardly from the lower face and the head of the screw 10 rests upon the felt 6. An expansive coil spring 11 is placed between the rail 9 and the abutment 8. A swinging arm 12 is rigidly connected against the front side of the rail 9 and is connected to the forward end of the arm 7 by a pin 13.

The brackets 4 carrying the abutments 5 and 8 and the arms 7 are at the outer sides of the collection of actions and the capstan screws 10 are near the ends of the small action rail 9. Flanges 14 are secured to the small action rail 9 one for each action. The lower swing 15 is connected to the flange 14 by a pin 16 and extends forwardly in a horizontal position. An abstract 17 is connected to the forward end of the lower swing 15 by a pin 18. The lower swing 15 has an extension 19 offset upwardly in front of the pin 18. An adjusting screw 20 is screw-seated through the extension 19 and rests upon the rocker 21 fixed upon the key 1.

The intermediate action rail 22 is fixed in the bracket 4 above the small action rail 9 and the main action rail 23 is fixed in the bracket 4 some distance above the intermediate rail 22. The action 24 is mounted upon the main action rail 23 and the details of this action are shown, described and claimed in a companion application, Serial No. 322728.

The equalizing damper 25 is mounted upon the main action rail 23 and upon the

intermediate action rail 22, and the details of the equalizing damper are shown, described and claimed in the companion application above mentioned.

The lifter bar 26 is connected to the central portion of the swinging arm 12 by a pin 27. The hammer rest rail 28 is connected to the upper end of the lifter bar 26 by a pin 29, and to the action bracket 4 by an arm 28^a.

The soft pedal rod 30 is slidingly mounted through the key-frame 3 and has a pin 31 extending from its upper end and engaging in a socket opening 32 formed from the lower face 33 of the hammer rest rail 28 so as to hold the soft pedal rod 30 from slipping out of connection with the hammer rest rail 28. The soft pedal rod 30 is mounted through the key-frame 3 and the rod is connected to the soft pedal.

The regulating rail 34 is connected to the main action rail 23 by arms 35 and the regulating rail 34 is cut short enough to pass between the vertical swings 26 and between the soft pedal rods 30, the links 26 and pedal rods 30 being duplicated at either end of the piano.

An abutment 36 extends forwardly from the bracket 4. A felt 37 is mounted upon the abutment 36. A capstan screw 38 is tapped upwardly into the hammer rest rail 28 from its lower face 33 and rests upon the felt 37, there being a capstan screw 38 and coöperating parts at each end of the collection of actions.

Instead of the regulating screw 20 bearing upon the key rocker 21, as shown in Fig. 1, the capstan screw 39 may be tapped into the key and engage a felt 40 secured to the extension 19 as shown in Fig. 3, but the construction shown in Fig. 1 is preferred. The preferred construction is easier to regulate, is much more quickly operated and reduces the cost to the piano maker, as he does not have to buy and set the capstan screws in the keys. The action comes already fitted with the regulating screw.

The small action rail or flange rail 9 may be provided with several of the metal swings or arms 12 and, of course, there must be as many action brackets 4 having the arms 7 as there are swings 12. The capstan screws 10 serve to adjust the flange rail 9 to its normal position.

The coil springs 11 may be seated in the upper face of the flange rail 9 to hold the springs from slipping out of place, and the tops of the springs may be seated or otherwise secured to the abutments 8. The purpose of the springs is to exert a flexible pressure on the flange rail. The vertical swings 26 serve as lifter bars for raising the flange rail 9 when the soft pedal is operated.

The capstan screws 38 serve to adjust the hammer rest rail 28 to its proper normal position to regulate the normal striking distance of the hammer 42 from the wire 41. The capstan screws 38 and 10 are adjusted together to produce uniformity of touch and place proper tension upon the parts. Through the lifting motion of the pedal rod 30 when the soft pedal is operated the hammer rest rail 28 is moved upwardly and forwardly on the swing 28^a and this movement carries the hammer 42 forwardly to the correct striking distance from the wire 41, as shown in Fig. 2. This motion of the hammer rail 28 through the lifter link 26 raises the rear end of the swing 12 thereby raising the flange rail 9 thereby lifting the rear end of the swing 15 which is fulcrumed upon the rocker 21 of the key, and this movement raises the abstract 17 thereby raising the jack 43 in proportion to the upward movement of the hammer butt 44 thereby keeping the upper end of the jack 43 at all times accurately adjusted to the back stop 45 of the hammer butt; and at this time this entire movement causes the jack extension or heel 46 to be automatically adjusted with perfect accuracy to the escapement or regulating screw 47.

The contact point between the jack heel 46 and the regulating screw 47 has always been the one great stumbling block in the way of a successful soft pedal construction as this escapement screw must at all times be adjusted with accuracy and fineness, and heretofore when properly adjusted for normal action it was not properly adjusted for the pianissimo action. My form of construction positively solves the problem and gives to the world an absolutely practical and reliable tonometer.

So far as the normal action is concerned, the two capstan screws 10 and 38 are of great importance. Simply by properly operating these two screws the action is instantly, accurately and permanently adjusted to regulate the normal hammer throw or striking distance, and when the soft pedal is properly connected no further adjustment is necessary, and the adjustment when properly made is permanent.

Thus I have produced a soft pedal construction for upright pianos the leading features of which are as follows: Action brackets having flange rail abutments extending backwardly from their lower ends and swing supporting arms extending forwardly from their lower ends, a lower action rail having rigid swings extending forwardly and pivotally connected to the swing supporting arms and capstan screws extending downwardly and supported by the flange rail abutments, upper flange rail abutments extending backwardly from the action brackets, springs inserted between the upper flange rail abutments and the flange rail, hammer rest rail abutments extending forwardly from the upper parts of the action

brackets, hammer rest rails having capstan screws supported by the hammer rest rail abutments, vertical swings connecting the hammer rest rails to the central portions of the action rail swings, lower action swings connected to the lower action rail and supported by the rear ends of the keys, actions having stickers pivotally connected to the lower action swings, and soft pedal rods engaging the hammer rest rails.

Various changes may be made without departing from the spirit of my invention as claimed.

I claim:

1. A pianissimo device for upright piano actions comprising in combination, action brackets having lower rail abutments extending backwardly from the lower ends thereof and swing supporting arms extending forwardly and opposite to the lower rail abutments, a lower action rail having rigid swing arms extending forwardly and pivotally connected to the swing supporting arms and having capstan screws extending downwardly from the rail and adapted to bear upon the lower rail abutments, upper rail abutments extending backwardly from the action brackets and in vertical alinement with the lower rail abutments, springs inserted between the upper abutments and the lower action rail, hammer rest rail abutments extending forwardly from the upper part of the action brackets, a hammer rest rail having capstan screws extending downwardly from the rail and adapted to bear upon the hammer rest rail abutment, links connecting the hammer rest rail to the rigid swings of the lower action rail and intermediate of their ends, lower action swings connected to the lower action rail and extending forwardly and bearing with their outer ends upon the piano keys, abstract members connecting with the swings carried by the lower action rail and at a proper distance backwardly of the point of bearing upon the piano keys, and jacks connected to the abstracts for operating the hammers.

2. In a pianissimo device for upright piano actions, in combination with a hammer and a key and mechanism connected with the key for operating the hammer, a hammer rest rail mounted to swing toward the strings of the piano, a support for carrying the hammer rest rail in a normal position, means for raising the hammer rest rail off its support thereby advancing the hammers toward the strings, and means for raising the mechanism for operating the hammers properly in unison with the movement of the hammer rest rail without changing the point of contact of the hammer mechanism with the piano keys.

3. In a pianissimo device for upright pianos, in combination with a hammer, a key and mechanism connected with the key for actuating the hammer; a hammer rest rail mounted to swing toward the strings of the piano, a support adapted to carry the rest rail in a normal position, means for adjusting the rest rail relative to its position on the support, means for raising the hammer rest rail off its support, means for raising the hammer actuating mechanism in unison with the movement of the hammer rest rail without disturbing its operative relation to the piano keys, a seat for supporting the hammer actuating mechanism in a normal position, and means of vertical adjustment imposed between the seat and the hammer actuating mechanism.

4. A pianissimo device for upright piano actions comprising, in combination with a hammer, a key and means operatively disposed relative to the key for actuating the hammer; a hammer rest rail mounted to move toward the piano strings, a lower action rail mounted to move toward the hammer rest rail, a link connecting the hammer rest rail with the mounting of the lower action rail, a swing pivotally mounted to the lower action rail and extending forwardly therefrom its forward end resting upon a piano key, means for operating the hammer connected with the swing adjacent to its forward end, and a piano key having a bearing adapted to receive the forward end of the swing.

5. A pianissimo device for upright piano actions comprising, in combination with a hammer, a key and means operatively disposed relative to the key for actuating the hammer; a hammer rest rail mounted to move toward the piano strings, a lower action rail mounted to move toward the hammer rest rail, a link connecting the hammer rest rail with the mounting of the lower action rail, a swing pivotally mounted to the lower action rail and extending forwardly therefrom, means connected with the swing adjacent to its forward end for actuating the hammer, and an adjustable bearing fixed to the forward end of the swing adapted to contact with the piano keys, the bearing being adjustable vertically and thereby adapted to raise and lower the actuating means through a short range of adjustment.

6. A pianissimo device for upright piano actions comprising, in combination with the action, a hammer rest rail mounted to move in an arc closely related to the arc of movement of the hammers, a lower action rail mounted to move toward the hammer rest rail, a link connecting the hammer rest rail with the lower action rail, a swing pivotally mounted on the lower action rail and extending forwardly therefrom, the swing being for carrying the piano action operatively, a bearing mounted on the forward end of the swing adapted to be adjusted

vertically, a piano key having a rounded bearing surface at its rear end adapted to receive and support the adjustable bearing in the forward end of the swing, and means for moving the hammer rest rail.

7. In a pianissimo device for upright piano actions, in combination with the hammer and a key and mechanism connected with the key for operating the hammer, a hammer rest rail mounted to swing toward the strings of the piano; a support for carrying the hammer rest rail in a normal position; means for raising the hammer rest rail off its support, thereby advancing the hammer toward the strings; and means for raising the mechanism for operating the hammers properly in unison with the movement of the hammer rest rail without changing the angular relationship of the hammer mechanism to the piano keys.

In testimony whereof I have signed my name to this specification.

FRANK L. GEORGE.