P. WELIN.

EXPRESSION MECHANISM FOR PIANOS.

APPLICATION FILED DEC. 7, 1905. RENEWED JUNE 15, 1909.

945,888. Patented Jan. 11, 1910.

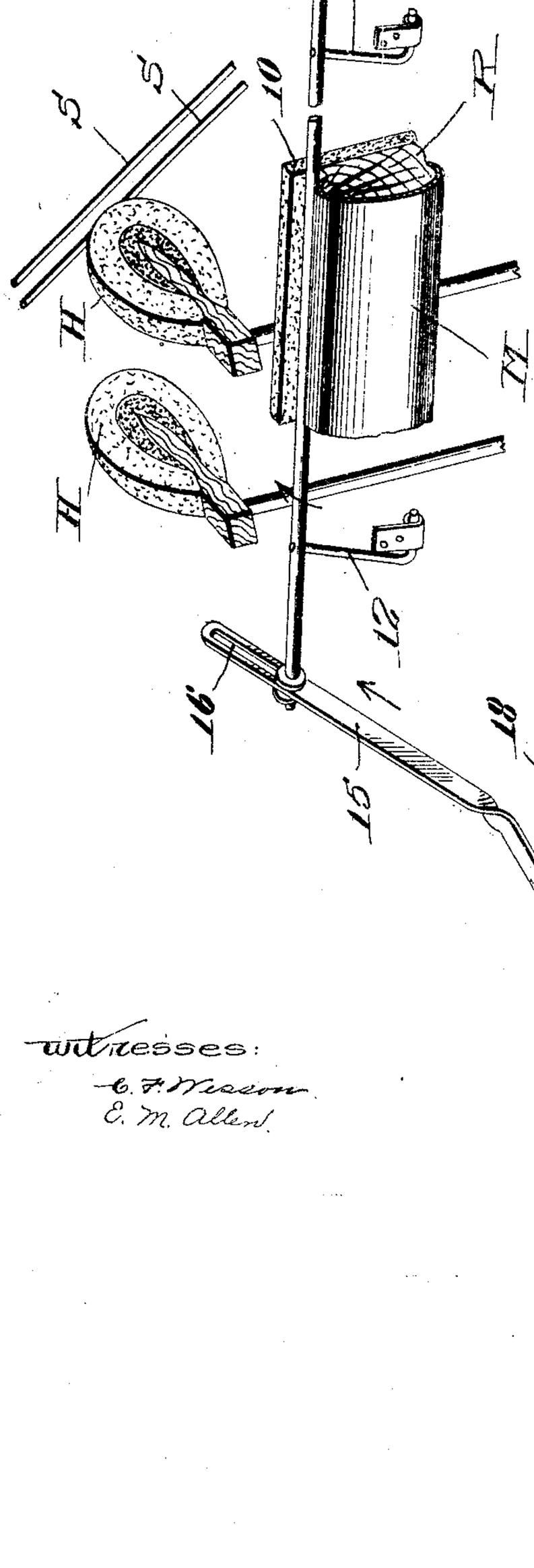


Fig. 2.

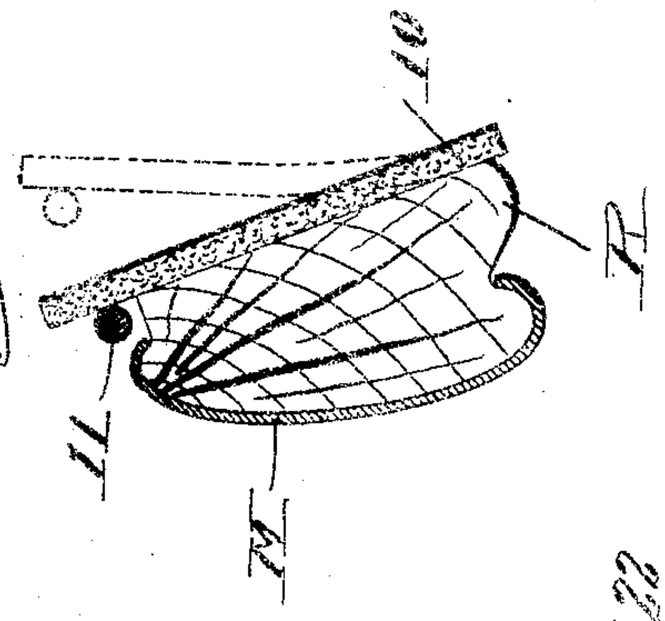
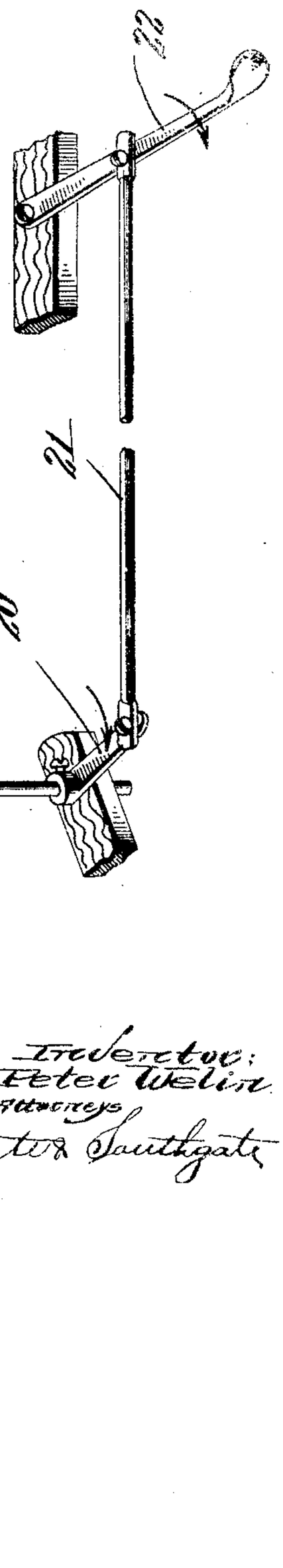


Fig. 3.



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UNITED STATES PATENT OFFICE.

PETER WELIN, OF NEWCASTLE, INDIANA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO KRELL AUTO-GRAND PIANO CO. OF AMERICA, OF CONNERSVILLE, INDIANA, A CORPORATION OF INDIANA.

EXPRESSION MECHANISM FOR PIANOS.

945,888. Specification of Letters Patent. Patented Jan. 11, 1910.

Application filed December 7, 1905, Serial No. 290,750. Renewed June 15, 1909. Serial No. 502,331.

To all whom it may concern:

Be it known that I, PETER WELIN, a citizen of the United States, residing at Newcastle, in the county of Henry and State of Indiana, have invented a new and useful Expression Mechanism for Pianos, of which the following is a specification.

This invention relates to a construction for softening the notes sounded on a piano.

The invention relates especially to automatic pianos.

The object of this invention is to varyingly soften the notes sounded by a piano, the maximum softening effect being produced on the lower bass notes, and from which maximum softening a gradual return to normal striking action is secured so that there will be no marked break in the entire compass of the piano between successive notes.

To this end this invention consists of the modulating mechanism for a piano action, and of the combinations of parts therewith as hereinafter described and more particularly pointed out in the claims at the end of this specification.

In the accompanying drawing, Figure 1 is a diagrammatic perspective view of sufficient parts of a piano action to illustrate the application of this invention thereto, and Fig. 2 is an enlarged sectional view of the hammer-rail.

In automatic pianos which are now employed, each striking device is operated by a main pneumatic. In these instruments the striking pneumatics are usually all of the same size, so that the same force is exerted for striking all the notes within the range of the automatic playing instrumentalities. In practice it has been found impractical to produce the best artistic results from these automatic pianos for the reason that when the notes are sounded with equal force the heavier bass notes will predominate. To overcome this, most automatic pianos are now provided with a divided action which permits the softening of all the bass notes within the range of the playing devices, while leaving the treble notes to be sounded with full force. The dividing of the action of an automatic piano in this way is objectionable as the division must be made at some arbitrarily selected note, and between two successive notes of the piano there is necessarily a marked contrast in the loudness with which the same will be sounded.

The especial object of my present invention is to provide for producing more artistic effects from an automatic piano by means of a modulating or softening device for the bass notes which will produce a varying softening effect having a maximum effect on the lower bass notes and comparatively little softening effect on the higher bass notes.

By means of this invention I have been enabled to produce an automatic piano in which there is no marked difference in the timbre or loudness of successive notes, but in which at the same time the bass notes will be sufficiently softened so that they will not drown out the air or be undesirably prominent.

In the particular construction which I have herein illustrated the hammers are shifted or moved from normal position when a modulating action is desired, and the hammer shifting mechanism is so mounted and combined with the hammers that the hammers of the lower bass notes will have a comparatively short stroke, while the hammers for the higher bass notes will be permitted to have longer strokes, gradually increasing to the full stroke allowed the treble or higher notes of the piano. I have accomplished this result by an attachment or set of operating connections for shifting the cushioned face of the hammer-rest rail.

Referring to the drawing and in detail, as shown in Fig. 1, S—S designate the piano strings. Coöperating with the piano strings are the usual hammers H—H, only two of such hammers being herein illustrated, although it is to be understood that the invention is applied to modulate or control the entire series of hammers of the bass notes of the piano. The hammers when in normal position are supported by the usual hammer-rest rail R which is stiffened by a metal shell M. These parts may be of the ordinary or usual construction used in piano actions and need not be herein illustrated or described in detail.

Fastened along the lower edge of the face of the hammer rest rail is a felt cushion 10. The upper edge of this cushion of felt 10 is left unattached or free from the hammer-

rail so that the same can be swung forward as illustrated by dotted lines in Fig. 2.

In order to swing the felt cushion forward to progressively diminish the impact of the hammers, I have provided a rod 11 carried by pivoted arms 12, 13 and 14. The arm 14 nearest the center of the piano is comparatively short, while the arms 13 and 12 are each successively somewhat longer. By means of this construction when the rod 11 is swung or turned to move the felt cushion 10, the end of the rod nearest the lower bass hammers will be moved in the longer distance; while the end nearer the center of the piano will have but slight, if any, movement.

The shifting of the rod 11 is preferably controlled by connections from a hand-lever located in convenient position near the piano key-board. As herein illustrated, these connections comprise a link 15 which is connected at one end to the rod 11 by means of a slot 16. At its other end the link 15 is connected to an arm 17 fastened on a vertical rock-shaft 19. Coöperating with the arm 17 is a holding spring 18 for holding the bar 11 in its adjusted position. Near its lower end the shaft 19 is provided with an arm 20 connected by a link 21 to a hand lever 22. When the hand lever 22 is shifted in the direction of the arrow the hammers will be moved to produce the desired progressive modulated effect, and the hammers will be retained in their shifted positions by the spring 18. When the parts are in normal position they will not interfere with the shifting of the hammer-rest rail by pedal action in the ordinary way producing softening effects.

While I have illustrated and described one particular form in which this invention may be embodied, I am aware that many modifications may be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to the particular form of construction shown, but—

What I do claim is:—

1. In a piano, the combination with a series of striking devices, of means for reducing the normal length of stroke of all the striking devices and reducing the length of stroke of those at one end in a maximum degree and of those on the other end in a minimum degree while all the others are reduced to intermediate degrees gradually varying all the way from one end of the series to the other, and means for holding said reducing means in adjusted positions.

2. In a piano, the combination with the hammers of means for adjusting the rearward position of the hammers toward the strings to secure a reduction of the length of stroke of all the hammers from the normal, varying all the way from the treble end to the bass end, the maximum reduction being at the bass end and means for frictionally holding said adjusting means in any adjusted position, whereby the adjusting means may be left in any desired position, and the maximum reduction at the bass end may be of any desired amount.

3. In a piano, the combination with the hammers and a series of strings, of means for supporting the hammers normally at equal distances from the strings, and means for moving the hammer-supporting means toward the strings to a position at an angle with respect to its normal position, the supporting means when adjusted being nearest the strings at one end of the series, whereby the reduction of the length of stroke of all the hammers will be secured gradually all the way from one end to the other end with a maximum reduction at one end and a minimum amount of reduction at the other end and means for frictionally holding the supporting means in any adjusted position.

4. In a piano, the combination of the hammers, a hammer rest rail, a flexible cushion mounted on the face of the hammer rest rail, and means for moving the flexible cushion to an angular position with respect to the hammer rest rail.

5. In a piano, the combination of the hammers, the hammer rest rail, a flexible cushion mounted on the face of the hammer rest rail, and means for moving the cushion to an angular position with respect to the hammer rest rail so that the cushion will be nearest the strings at the base end of the notes.

6. In a piano, the combination of the hammers, a hammer rest rail, a felt cushion mounted on the face of the hammer rest rail, and means for moving the felt cushion to an angular position with respect to the hammer rest rail, comprising an operating rod, arms of different lengths supporting said operating rod, a hand lever, and connections from the hand lever for swinging the rod on the arms.

7. In a piano, the combination of the hammers, a hammer rest rail, a felt cushion mounted on the face of the hammer rest rail, means for moving the felt cushion to an angular position with respect to the hammer rest rail, comprising an operating rod, arms of different lengths supporting said operating rod, a hand lever, connections from the hand lever for swinging the rod, and means for holding the operating rod in its adjusted position.

8. In a piano, the combination of the hammers, the hammer rest rail, a felt cushion fastened along its lower edge to the hammer rest rail, a rod for shifting the felt cushion, arms of different lengths supporting said rod, a hand lever, a rock shaft operated therefrom, and a slotted connection between the rock shaft and the rod, permitting the

swinging of the hammer rest rail independently of the adjustment of the rod.

9. In a piano, the combination of the hammers, the swinging hammer-rest rail, a flexible cushion carried by the hammer rest rail, and means for setting the flexible cushion at an angle to the hammer rest rail and still permitting the swinging of the hammer rest rail.

10. An adjusting device for the hammers of a piano comprising a hammer rest rail, means connected therewith for supporting the hammers in a retracted position, and means for adjusting the position of the supporting means to cause the line of hammers to assume a position oblique to its original position, whereby a gradual varying of the length of the stroke of said hammers from one end of the line thereof to the other may be secured, the hammer-rest-rail being left free to swing during the adjustment of the supporting means.

11. An adjusting device for the hammers of a piano, comprising a hammer rest rail, means connected therewith for supporting hammers in a retracted position, and means for adjusting the position of the supporting means to cause the line of hammers, resting on said support, to assume a position oblique to its original position, whereby a gradual varying of the length of the stroke of said hammers from one end of the supporting means to the other may be secured, the hammer rest rail being left free to swing during the adjustment of the supporting means.

12. An adjusting device for the hammers of a piano, comprising a hammer rest rail, a flexible cushion carried by the rest rail and free to move from it at one side, a rod for moving said cushion, and arms on said rod, each arm being pivotally supported, said arms being of different lengths and varying from one end of the rod to the other, whereby when the rod is swung on the pivots one end of it will be moved farther than the other end.

13. In a piano, the combination with the hammers of means for supporting the hammers in retracted position, comprising a rod, a plurality of arms secured to said rod on which said rod is pivoted, the axes at which the arms are pivoted being at varying distances from the rod, those at one end being shorter than those at the other end.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

PETER WELIN.

Witnesses:
EDWIN B. PFUN,
CHARLES L. DENGLER.