

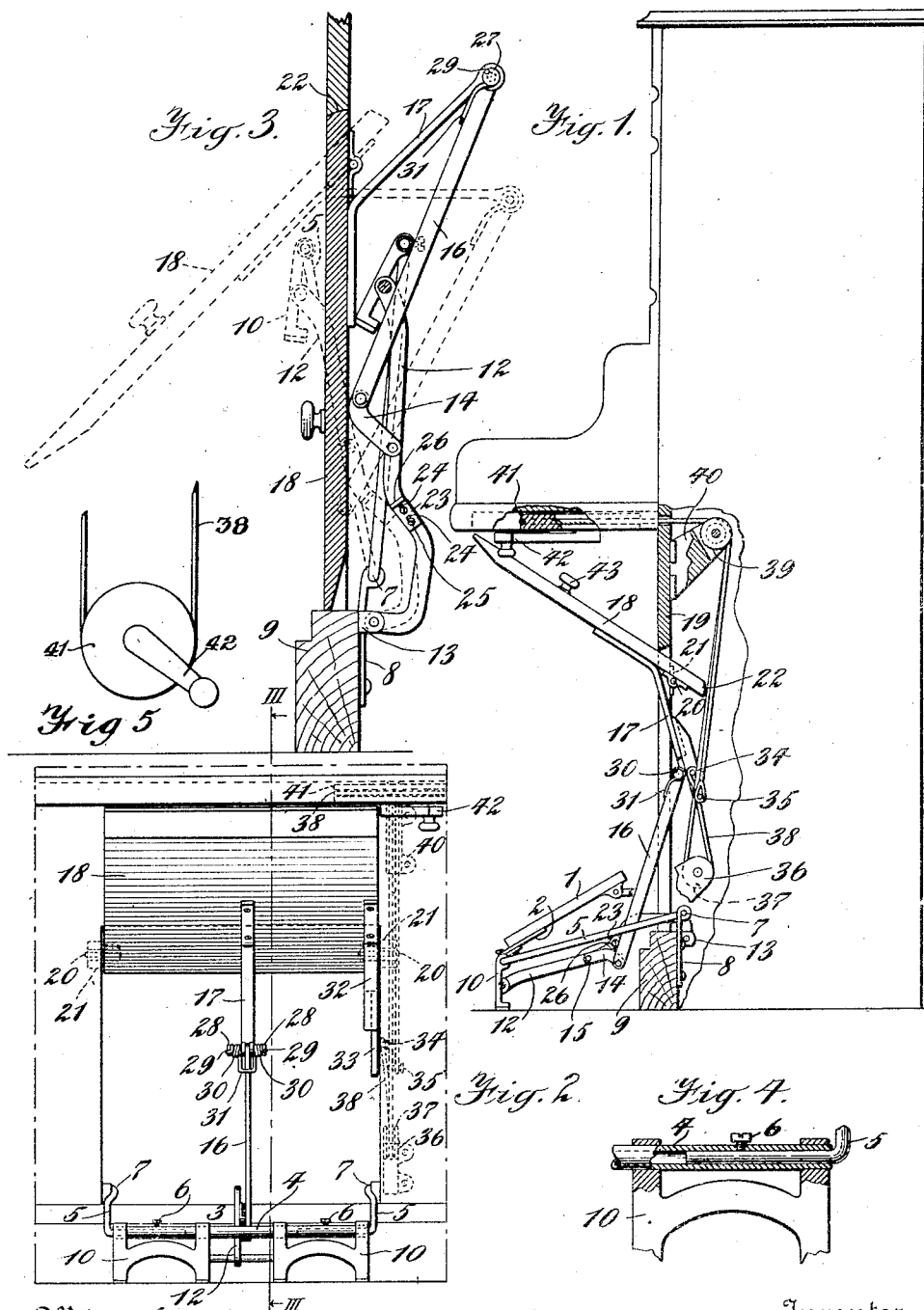
G. SANTOIEEMMA.

TREADLE SHIFTING MECHANISM FOR PIANO PLAYERS AND THE LIKE.

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Witnesses:
Geo. L. Cheney
Chas. F. Hoden

Inventor
Giovanni Santoiemma
 By *Attorneys*
Rosenbaum, Stark & Bridge

UNITED STATES PATENT OFFICE.

GIOVANNI SANTOIEEMMA, OF NEW YORK, N. Y.

TREADLE-SHIFTING MECHANISM FOR PIANO-PLAYERS AND THE LIKE.

1,048,351.

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To all whom it may concern:

Be it known that I, GIOVANNI SANTOIEEMMA, a subject of the King of Italy, residing at New York city, in the borough of Manhattan and State of New York, have invented certain new and useful Improvements in Treadle-Shifting Mechanism for Piano-Players and the Like, of which the following is a full, clear, and exact description.

This invention relates to a mechanism for moving the treadles or pedals used more particularly in connection with player pianos and the like, into operative or inoperative position; and has for one of its objects the provision of novel means for expeditiously moving such pedals into and out of an opening disposed in the lower front board of, for example, a player piano, with a minimum of exertion on the part of the operator.

Another object of the herein described mechanism is to connect the panel or cover of such an opening directly with said treadles in such manner that the latter may be moved into their inoperative position substantially while the said panel or door is being closed, and vice versa.

Still another object of the invention is to provide a novel means for actuating this panel.

These and other objects of my invention will be hereinafter referred to and the novel elements and combinations of elements whereby said objects may be attained will be more particularly set forth in the claims appended hereto.

I am aware that various modifications and changes may be made in the herein described structure, which are within the purview of my invention, and hence do not desire to be limited other than by the scope of the said claims.

Referring to the drawings which form a part hereof and in which like reference characters designate like parts throughout the several views: Figure 1 is a side elevation of a piano with a portion of the casing of the same broken away to show the treadle and panel shifting mechanism. Fig. 2 is a front elevation of the mechanism proper. Fig. 3 is a section of the same taken on the line III—III of Fig. 2, the treadles being disposed in their inoperative position. Fig.

4 is a detail of construction. Fig. 5 is a bottom plan of the manually operated part.

The treadles 1 may be of any suitable construction, being preferably hinged by means of suitable brackets 2 to a frame, broadly designated 3. This frame is preferably substantially U-shaped as indicated in Fig. 2, and in the form of device herein more particularly described consists of a tubular section 4 and two somewhat Z-shaped members 5 which are adapted for engagement with the tube 4, in the manner shown in Fig. 4. This construction facilitates the taking apart of the structure and the elements 4 and 5 may be held securely together by any suitable means, such for example, as the set screws 6. Each member 5 is pivotally connected as at 7 to a suitable bracket 8 affixed to the piano frame 9; as shown in Figs. 1 and 3. The U-shaped frame 3 is spaced from the floor in any suitable manner, when in its outermost position, as by means of stands 10. I prefer to connect these stands rigidly together by means of a cross-bar 11, and this cross-bar is in engagement with a bent operating lever or part 12 which is also pivotally connected at its inner extremity to a small bracket 13 fastened to the frame member 9, preferably substantially midway between the bracket 8. The part 12 has pivotally connected thereto a small, preferably somewhat arcuate link 14, the latter being connected to the lever 12 at 15, and the other extremity thereof being connected to a bar or link 16, which extends upwardly therefrom toward, and is pivotally connected to the offset extremity of a bracket 17, which is secured to the inner or under side of a panel or door 18, the latter serving to close the aperture in the center of the lower front board 19 of the piano, through which the treadles emerge when being moved into their operative position.

The panel 18 may be pivotally connected by pins or trunnions 20, one of which is disposed upon either side thereof, to suitable bearings or brackets 21 upon the rear side of the board 19. The upper end or edge 22 of the panel is preferably made arcuate, as shown in Figs. 1 and 3, so that when the panel is in its closed position the aperture within which it swings may be completely closed at the top thereof, the curvature of

the surface of the end 22 being concentric with the pivotal axis of the panel. The link 12 also carries an adjustable stop 23, which in the present instance consists merely of a short flanged plate having slots 24 therein adapted for the reception of screws 25, which latter are threaded into the lever 12. One edge of the plate 23 is flanged, as at 26, to adapt it for engagement with the short link 14, as shown in Fig. 1.

The treadles 1 of course are connected in any suitable manner with the bellows or corresponding operative parts of the player mechanism, but since such elements form no part of the present invention they will not be herein further referred to. The link 16 and bracket 17 are connected by means of a pin 27, which preferably has a driving fit with, or is otherwise firmly secured to, said bracket 17, the extremity of which may be bifurcated for the reception of the end of the link 16. This pin may be of any suitable description, and is preferably provided with a head 28 at either extremity thereof, which may be notched for the reception of the bent end 29 of a spring 30. Spring 30 preferably comprises a U-shaped section 31 and one or more turns or coils upon either side of such section, the coils preferably being wound in opposite directions. Hence the spring 30 normally operates to press the link 16 away from the bracket 17; or in other words, it tends to throw the lower extremity of the said link 16 inwardly toward the piano; no matter where the panel 18 may be disposed. The reason for this construction will be hereinafter explained. Upon one side of the panel 18 is a second bracket 32 of somewhat similar shape to the bracket 17; but in place of having a link like that designated 16 attached thereto, the bracket 32 terminates in an offset part 33 from which project laterally two pins respectively designated 34 and 35; pin 34 being preferably somewhat shorter than pin 35. Below the bracket 33 and immediately to one side of the aperture which door 18 is designed to cover is a bracket 36, which is preferably affixed to the rear wall of the board 19. This bracket has been partly broken away in Fig. 1, so that only the outer extremity thereof is therein shown, owing to the fact that the section is taken beyond the said bracket. Bracket 36 carries a roller 37, pivotally mounted therein, around which passes a flexible connecting element 38, the latter preferably being a round leather belt, or the like. I do not desire, however, to be limited to any particular material in so far as this element is concerned; nor to any particular construction thereof. One extremity of the flexible element is secured to pin 34, as indicated in Figs. 1 and 2, and the element passes downwardly from this pin around the roller or idler 37 above referred to, and

thence upwardly toward and around one of a pair of rollers or idlers 39, which latter are pivotally mounted in bracket 40 secured upon the rear portion of the wall 19 preferably directly above bracket 36. The flexible element then passes forwardly beneath the keyboard of the piano, if that be the instrument to which the mechanism in question has been applied, and thence around a grooved wheel or pulley 41 which is secured to the under side of the projecting portion of the instrument. The pulley 41 is of course pivotally mounted and is adapted to be oscillated in one direction or the other by means of a handle 42, or the like. The flexible element after passing around this pulley passes over the second of the pulleys 39 and thence downwardly toward and into engagement with the pin 35. By reason of this exceedingly simple arrangement the door 18 may be swung open and the treadles and their support may be swung outwardly and downwardly into operative position or vice versa, with a minimum effort on the part of the operator, by merely swinging the handle 42 in the proper direction.

The operation of the mechanism is as follows: Assuming that the treadles are operatively disposed as shown in Fig. 1 and that the panel 18 is in substantially its uppermost position. If now it be desired to slightly vary the position of the panel with respect to the under side of the projecting front of the instrument, it is merely necessary to shift the position of the plate 23 in one direction or the other, as the case may be, with respect to the lever 12. If as shown in Fig. 1, for example, the plate 23 be shifted downwardly, while of course at the same time taking the pressure away therefrom by lifting the panel 18, the toggle-like arrangement formed by the projecting arm of the bracket 17 and the link 16 will be somewhat straightened out and thence the panel will be obliged to remain in a somewhat more elevated position, when the stands 10 are in engagement with the floor. Assuming now that the uppermost position of the panel has been fixed at such a height as to comfortably clear the knees of the operator when in position before the instrument; when the handle 42 is turned counterclockwise, as viewed from below, that portion of the flexible element which extends downwardly toward the pin 35 will be placed under tension and will draw the said pin upwardly in the direction of the bracket 40. At the same time the other side of the flexible element is slackened and hence is drawn freely around the pulley 37 and upwardly by the pin 34. This effects a downward movement of the door about its pivotal axis. The upward movement of the offset arm of the bracket 17 draws the link 16 upwardly and places the spring 30 under

increased stress. The tension in the link 16 is transmitted to the short link 14 and pulls the latter firmly up against the stop 23. As the latter is mounted upon the lever 12 which is pivoted to said bracket 13, the said lever is swung upwardly and inwardly around its pivotal axis, and acts as a lever of the third-class; the fulcrum being at 13, the weight to be lifted being applied to the outer extremity of said lever, and the power being applied intermediate the fulcrum and the weight. This action, of course, elevates the treadle support 3 together with the treadles attached thereto, and swings all of the mechanism through the opening in the board 19 back into the piano casing. The disposition of the various pivotal points is such that the treadles are substantially housed before the panel 18 has been swung downwardly to such point as to interfere with their passage into the piano casing; while the final downward and closing movement of the panel brings the pivot 15 behind link 16 which results in swinging the link 14 forward and upward, raising it from its seat against the stop 23. This short link therefore performs a plurality of important functions in that it not only co-operates with the adjustable stop 23 to determine the upward throw of the door 18, but it further facilitates the proper and complete closing of the door 18; acting as a yielding connection between the lever 12 and link 16. In Fig. 3 I have illustrated in dotted lines the relative positions of the treadle support and stands 10, and the panel 18, when the door has been closed somewhat more than half way. The function of the spring 30, it may be here stated, is to insure the proper positioning of the short link or yielding connection 14 when the parts are being swung into and out of the piano casing; since were it not for this spring there would be a tendency, especially when the apparatus was used in a jerky manner, to reverse the position of the short link 13 throwing it forwardly out of engagement with the stop 23 at all times, which would necessitate the application of the hand of the operator to one of the links before the device could be properly actuated. The provision of the spring 30, however, obviates this difficulty and insures the proper relative disposition of the several parts at all times.

When it is desired to open the panel 18 and lower the treadles the handle 42 is moved in a reverse direction to that in which it was previously moved, thus effecting a downward pull upon the pin 34 through the instrumentality of the flexible element 38 and thereby operating the parts 16 and 17 toggle fashion.

Owing to the weight of the treadles and connected parts the links 16 will, whenever the treadles are being lifted into or out of

operative position, be placed under tension. This construction is preferable since where parts are so placed under tension they may be made lighter in weight and smaller in cross-section than is the case where a relatively extended link or bar is normally placed under compression. In practice the flexible element 22 remains at nearly all times quite taut, and attention is especially directed to the simplicity of the construction employed in this part of the device.

I have shown a knob or handle 43 upon the panel 18 and it is obvious that the entire device may be operated from this point. In other words, if the operator grasps the handle 43 so as to pull the door or panel open, for example, he not only actuates the panel, but also throws the treadles into their outermost position; and if the flexible element and its operating parts be operatively connected, the handle 42 will be swung around by this pull upon the knob 43. In other words, this mechanism has the parts thereof so inter-related that it may be operated from a plurality of points.

Having described my invention, I claim:

1. A treadle shifting mechanism for musical instruments, comprising a pivoted treadle support means whereby the same may be swung downwardly and outwardly from the lower portion of the instrument through a determined angle, a pivotally mounted panel and means whereby the same may be swung upwardly and outwardly from the lower portion of said instrument, and connections between said panel and treadle support for moving said parts substantially simultaneously, said connections including means for varying the angle through which said panel may swing.

2. A treadle shifting mechanism for musical instruments, comprising a treadle support means whereby the same may be moved outwardly from the lower portion of the instrument, a panel means whereby the same may be moved upwardly from a lower portion of said instrument, and means for moving said panel and treadle support together, said means including a flexible connection, one extremity at least of which is attached to said panel, a revoluble element, around a portion at least of which said flexible connection extends, and means for displacing said flexible connection.

3. A treadle shifting mechanism for musical instruments comprising a treadle support means whereby the same may be moved outwardly from the lower portion of the instrument, a panel and means whereby the same may be moved upwardly from a lower portion of said instrument, and connections between said panel and said treadle support whereby they may be moved together, said connections including a pivoted lever hinged to said treadle support, a link

pivottally attached to said panel, and a second link pivottally attached to said lever and to said first link, substantially as described.

4. A treadle shifting mechanism for musical instruments comprising a treadle support means whereby the same may be moved outwardly from the lower portion of the instrument, a panel and means whereby the same may be moved upwardly from a lower portion of said instrument, and connections between said panel and said treadle support whereby they may be moved together, said connections including two connected links, means for pivottally connecting one of said links to said panel, indirect means for pivottally connecting the other of said links to said support, and means for limiting the movement of one of said links with respect to the other.

5. A treadle shifting mechanism for musical instruments comprising a treadle support means whereby the same may be moved outwardly from the lower portion of the instrument, a panel and means whereby the same may be moved upwardly from a lower portion of said instrument, and connections between said panel and said treadle support whereby they may be moved together, said connections including two connected links, means for pivottally connecting one of said links to said panel, indirect means for pivottally connecting the other of said links to said support, and adjustable means for limiting the movement of one of said links with respect to the other.

6. A treadle shifting mechanism for musical instruments comprising a treadle support means whereby the same may be moved outwardly from the lower portion of the instrument, a pivottally mounted panel and means whereby the same may be swung upwardly and outwardly from a lower portion of said instrument, and connections between said panel and said treadle support, said connections including means for varying the upward swing of said panel for a determined movement of said treadle support.

7. In a treadle operated musical instrument, the combination of treadles and a panel adapted to cover the same when said treadles are in inoperative position, with a combined panel and treadle shifting mechanism, said mechanism including a treadle support, linked connections between said

treadle and panel, a handle and a flexible element operable thereby, said flexible element being attached to said panel.

8. In a treadle operated musical instrument, the combination of pivottally mounted treadles, a pivoted panel adapted to cover the same when said treadles are in inoperative position, and connections between said treadles and said panel, with means including a flexible inelastic element, for actuating the parts aforesaid.

9. In a treadle operated musical instrument, the combination of treadles means whereby the same may move into and out of operative position, a movable panel adapted to cover the same when said treadles are in inoperative position, and connections between said treadles and said panel, with means for actuating the parts aforesaid, said means including an extended flexible connection and revoluble elements about which said flexible connection passes.

10. In a treadle operated musical instrument, the combination of treadles means whereby the same may move into and out of operative position, a movable panel adapted to cover the same when said treadles are in inoperative position, and connections between said treadles and said panel, with means for actuating the parts aforesaid, said means including a handle, a flexible element operable thereby, a revoluble element around which said flexible element passes, one end, at least, of the latter being attached to said panel.

11. In a treadle operated musical instrument, the combination of treadles means whereby the same may move into and out of operative position, a movable panel adapted to cover the same when said treadles are in inoperative position, and connections between said treadles and said panel, with means for actuating the parts aforesaid, said means including a handle, a flexible element operable thereby, a revoluble element around which said flexible element passes, both ends of the latter being attached to said panel.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

GIOVANNI SANTOITEMMA.

Witnesses:

WALDO M. CHAPIN,
JAMES D. ANTONIO.