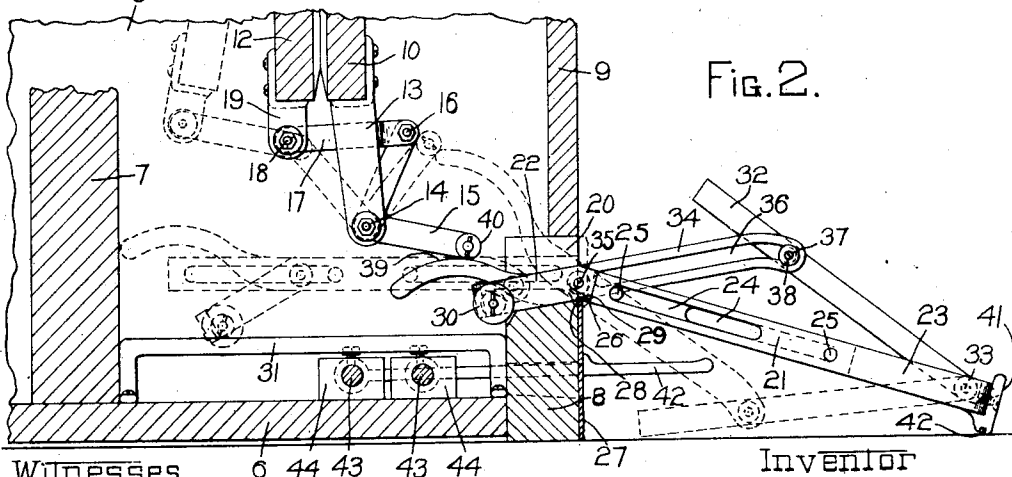
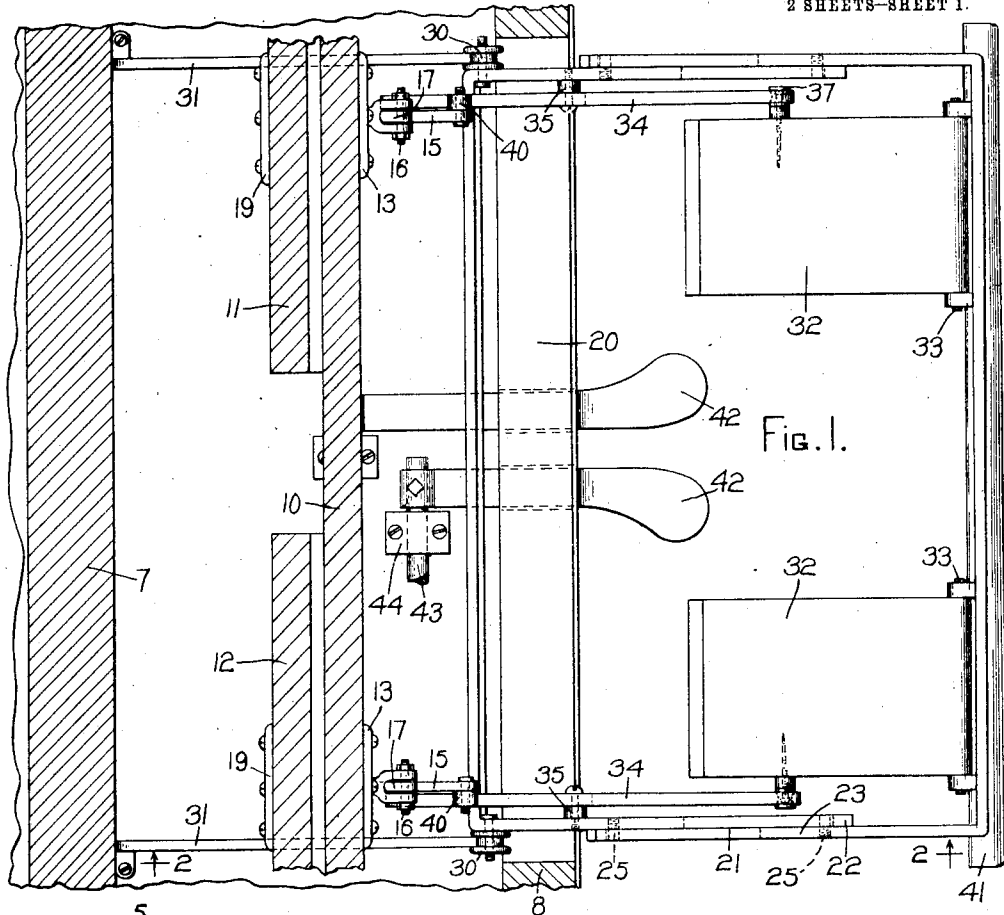


A. F. LARSON.
 PEDAL MECHANISM FOR AUTOMATICALLY OPERATED PIANOS.
 APPLICATION FILED APR. 22, 1910.

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2 SHEETS-SHEET 1.



Witnesses

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FIG. 3.

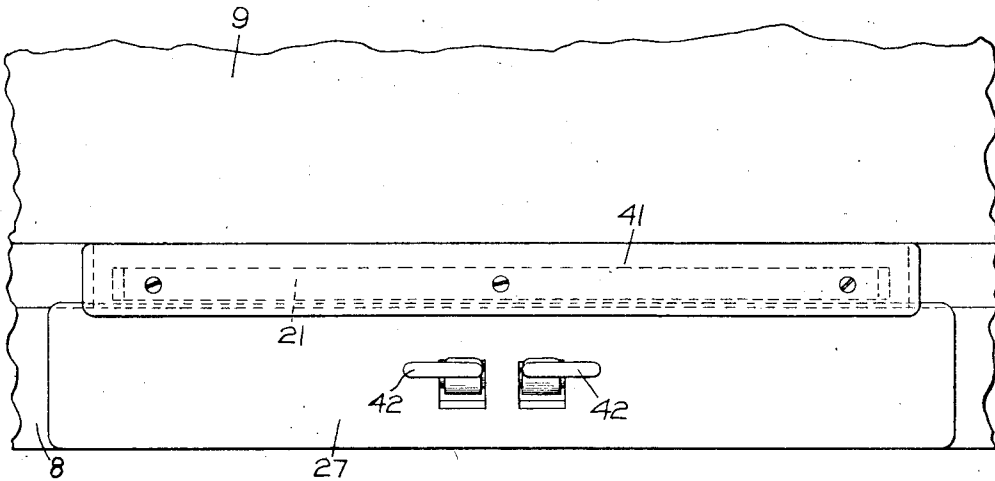
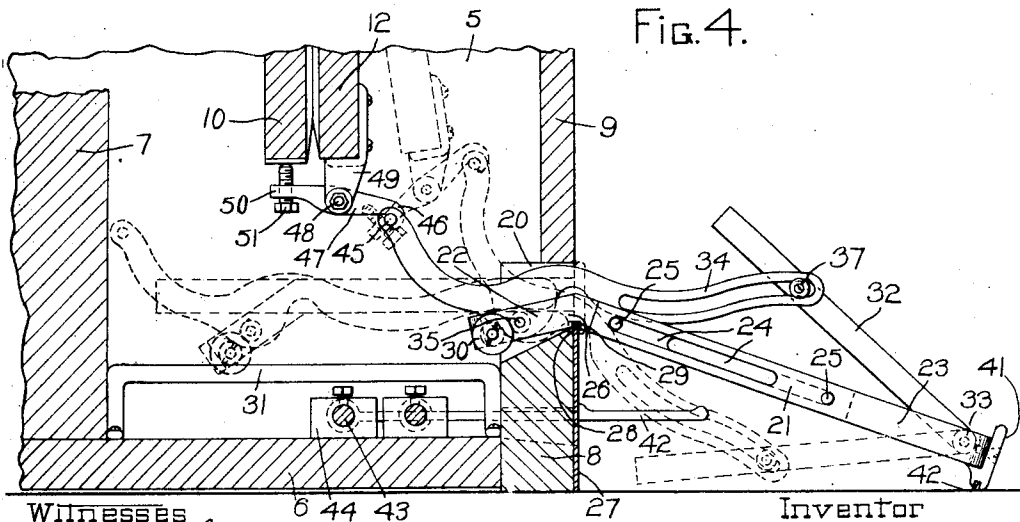


FIG. 4.



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UNITED STATES PATENT OFFICE.

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PEDAL MECHANISM FOR AUTOMATICALLY-OPERATED PIANOS.

998,185.

Specification of Letters Patent.

Patented July 18, 1911.

Application filed April 22, 1910. Serial No. 556,923.

To all whom it may concern:

Be it known that I, AXEL F. LARSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Pedal Mechanism for Automatically-Operated Pianos, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to automatically operated pianos, more particularly to pedal mechanism therefor, and has for its object the provision of such mechanism which may be made to occupy two set positions, one outside the instrument case in an operative position and another inside the instrument case in an inoperative position. Of course, mechanism answering this broad description is old and well-known in the art, but it is the particular object of my invention to provide an improved structure which collapses easily and quickly, which when in its outer position is effectively operative, and when in its inside position will be of neat and inconspicuous external appearance. To these ends I have provided a telescoping frame which is automatically reduced in size as the mechanism is thrust into the casing so that the entire structure may be made to occupy a very small space. When drawn to its outer position the frame opens so that it may properly support the pedals in position for effective operation.

Another particular feature of my invention, and one which is incident to the method of disposing the structure within the casing, is that of a detachable connection between it and the bellows which it is adapted to operate. Thus, in the preferred form of my invention, I have shown means whereby the bellows are operated through a simple cam and follower arrangement, while in a modified form I have shown a simple detachable hook connection.

My invention is embodied in the structure illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of the mechanism in its outer or operative position, showing the piano casing and the bellows mechanism in section; Fig. 2 is a cross-sectional view taken on the plane indicated by the line 2,

2 of Fig. 1 and looking in the direction of the arrows; Fig. 3 is a front view showing the mechanism in position inside the piano; and Fig. 4 is a view similar to Fig. 2, showing a modified form.

The piano casing is shown at 5, the base-board at 6, the backboard at 7, the toe-rail at 8, and the lower front panel at 9. A longitudinal supporting board 10 is provided and upon this board are mounted the feeder bellows 11 and 12, which are adapted to be operated alternately. Secured to the supporting board 10 by way of screws or other suitable means are the brackets 13, 13 suitably spaced for a purpose which will presently appear. The lower end of each of these brackets is provided with a pivot arrangement 14 and upon the pivot thus provided is suitably mounted a bell crank lever 15. One pivot end 16 of this bell crank lever is connected by means of a link 17 with the pivot 18 of a bracket 19 secured by way of screws or other suitable means to the movable member of the corresponding feeder bellows. It is clear that oscillation of the bell crank lever 15 will result in the proper actuation of the feeder bellows.

The toe-rail 8 is provided with a mortise 20 of such length as to extend in each direction beyond the bell crank levers 15, 15, and in this mortise is mounted the supporting frame 21 of the pedal mechanism. This supporting frame is rectangular in form and comprises two U-shaped parts 22 and 23, the sides of which have telescoping connection by means of the slot and pin arrangement 24 and 25. As shown in the drawings, pins are provided on each part for operation in corresponding slots in the other part, thus securing a reciprocal bracing effect. The side pieces of the part 22 have the elbows 26, 26 forming locking angles, and the rear arm of each elbow is arranged, if desired, to rest upon the oblique bottom of the mortise as shown in Fig. 2. The locking angle referred to is arranged to engage upon the front edge of the toe-rail so that the frame may be positively held in place while the pedals are being operated. In order to secure absolute and reliable locking, the usual front plate 27, which is secured to the toe-rail in any suitable manner, is extended slightly

above the bottom of the mortise so as to form the projection 28, which is thus arranged to enter a slot 29 formed in the elbow of the frame piece at the vertex of the angle.

The sides of the frame piece 22, at the rear ends thereof, are provided with the rollers 30, 30 which are adapted to roll upon the rails 31, 31 suitably mounted in proper place in the piano casing. The frame is shown in its outer position in full lines in Fig. 2 and it is clear that if raised to swing on the toe-rail the rollers 30, 30 will come down upon the rails 31, 31 so that the entire frame may be slid into the casing as indicated in dotted lines, the angle of the elbow being such that the frame may be substantially horizontal.

The pedals 32, 32 are suitably hinged at 33, 33 to the front part of the frame member 23.

Referring to the form of my invention shown in Figs. 1, 2 and 3, it will be seen that levers 34, 34 are pivoted to the inside of the frame piece 22 at 35, 35. One arm of each of these levers is provided with a slot 36, in which engages a roller 37 suitably pivoted at 38 to the corresponding pedal. It is clear that this arrangement provides for the oscillation of the lever by means of the operation of the corresponding pedal. The other arm of the lever 34 is in the form of a cam 39 upon which follows a roller 40 pivoted to the free arm of the corresponding bell crank lever 15. The cam surface is so formed that the oscillation of the lever will result in oscillation of the bell crank lever and, as before explained, the proper operation of the movable element of the corresponding feeder bellows. This being merely a contact engagement, it is clear that the entire pedal arrangement may be removed from connection with the feeder bellows by merely moving the frame rearwardly to the position shown in dotted lines in the drawing. Furthermore, the parts are so proportioned and relatively disposed that when the supporting frame 21 is swung upwardly as before explained, the pedals will drop into the plane of the frame and, as the frame is moved inwardly, the levers may be also held in place by reason of the engagement of their cam surfaces with their corresponding followers so that they may be brought into the same plane. Thus, as the forward end of the frame 22 is raised, the parts will all be brought in approximately the same plane and moved inwardly, the frame telescoping during such action, so that the entire arrangement may collapse to within small dimensions. The forward end of the frame 22 is provided with an escutcheon plate 41 secured thereto in some suitable manner and arranged, when the pedal arrangement is thrust into the piano casing, to close the

mortise 20 as indicated in dotted lines. In order to lock the frame in place, after it has been rolled into the casing, the lower edge of the escutcheon plate 41 is provided with a notch 42 which catches upon the extension 28 of the plate 27 in the same manner as has been described relative to the slot in the locking angle of the frame. The expression pedals of the piano proper are shown at 42, 42 as extending from actuating rods 43, 43, suitably mounted in bearing blocks 44, 44. It is clear that the arrangement described may be conveniently disposed above this pedal arrangement, the rails 31, 31 being especially designed for this purpose.

In Fig. 4 I have shown a slightly modified form of my invention, the modification lying in the form and disposition of the levers and the manner in which they operate the movable members of the feeder bellows. So far as possible, the same reference characters which have been used in other figures are here employed. Thus, each lever 34 is pivoted at 35 and is operated by the corresponding pedal 32 in the same manner as above described. The other arm of the lever is provided at its end with a pin 45 which, when the mechanism is drawn into its operative position, is adapted to operatively engage the hook 46 on a catch lever 47, pivoted at 48 to a bracket 49 secured to the movable member of the corresponding feeder bellows. It is significant that in the other form of my invention the movable members of the bellows were at the rear of the supporting board, while in this form they are at the front thereof. Each of the catch levers 47 has a tail 50 in which is threaded an adjusting screw 51 adapted to abut against the under side of the supporting board, as clearly indicated in the drawing. It is clear that the catch levers 47, 47 must occupy a certain position when the mechanism is at rest, so that when the pedal structure is rolled out of the casing the pins 45, 45 may properly engage the hooks 46, 46. And it is clear that by properly adjusting the screw 51 this result may be obtained.

I claim as new and desire to secure by Letters Patent:

1. In pedal mechanism for automatically operated pianos, a supporting frame comprising a plurality of telescoping parts mounted to be disposed either inside the piano in inoperative position or outside the piano in operative position, pedals hinged to said frame, and operating mechanism associated with said pedal.

2. In pedal mechanism for automatically operated pianos, a supporting frame comprising a plurality of telescoping parts mounted to be enlarged outside the piano casing when in operative position and reduced inside the casing when in inoperative

position, pedals hinged to said frame, and operating mechanism associated with said pedals.

3. In an automatically operated piano, a
5 frame comprising a plurality of telescoping parts mounted to be disposed outside the piano casing when in operative position and inside the piano casing when in inoperative position, and pedal mechanism mounted on
10 said frame.

4. In an automatically operated piano, bellows mechanism having an operating lever, a roller on the end of said lever, a supporting frame slidably arranged to occupy a
15 position outside the piano and a position inside the piano, a lever pivotally mounted on said frame, and a pedal mounted on said frame to operate said lever, said lever having a cam surface which is thus arranged to
20 be carried with said frame into engagement with said roller.

5. In an automatically operated piano, a pedal supporting frame mounted to slide into and out of the piano casing through a
25 mortise in the casing, said frame having an elbow to form a locking angle for locking over an edge on the casing.

6. In an automatically operated piano, a pedal supporting frame mounted to slide
30 into and out of the piano casing through a mortise in the casing, said frame having a notch to fit and lock over a ridge extending from the casing at the bottom of said opening.

7. In an automatically operated piano, a pedal supporting frame sliding through a mortise in the casing, said frame having an elbow to form a locking angle for locking
35 over the edge of the casing at the bottom of said mortise and having a notch in the vertex of said angle for locking over a ridge extending from said edge.

8. In an automatically operated piano, a frame comprising a plurality of telescoping
45 parts, rollers on said frame, and rails for said rollers inside the piano casing, said frame being thus mounted to be disposed inside the piano casing when in inoperative position and to be slidably withdrawn
50 through a mortise in the casing into an operative position on the outside.

9. In an automatically operated piano, expression pedal mechanism, a pedal supporting frame sliding into and out of the piano
55 casing through a mortise in the casing, rollers on said frame, and rails for said rollers inside the casing over said expression pedal mechanism.

10. In an automatically operated piano, a pedal supporting frame, pedals hinged to
60 said frame, levers pivoted to said frame and operatively having positive motion cam connection with said pedals, and bellows actuating mechanism associated with the free ends of said levers, said pedals, levers and
65 frame being arranged to occupy substantially a single plane so that the parts may be passed through a restricted opening in the casing.

11. In an automatically operated piano, a
70 pedal supporting frame extending through a mortise in the casing, pedals hinged to said frame, levers pivoted to said frame and having positive motion relative to said pedals, cam and follower means mechanically associating said levers with bellows mechanism, said pedals, levers, frame and cam
75 and follower means being so arranged that the followers may lead said levers and pedals into substantially the same plane
80 with the frame when the frame is swung upwardly about its rest so that it may be passed bodily through the mortise.

12. In an automatically operated piano, a casing having a mortise therein, a pedal
85 supporting frame adapted to slide through said mortise, and an escutcheon plate at the front of said frame, said plate being arranged to close said mortise when said frame is passed inside the casing.
90

13. In an automatically operated piano, a pedal supporting frame adapted to slide through a mortise in the casing, and an escutcheon plate at the front of said frame, said plate being arranged to close said mortise
95 when said frame is passed inside the casing, said plate having a notch adapted to lock over a part extending from the casing when said frame is inside the casing.

14. In an automatically operated piano, a
100 pedal supporting frame, pedals hinged to said frame, levers pivoted to said frame and having operative connection with said pedals, and bellows actuating mechanism associated with the free ends of said levers,
105 said pedals, levers and frame being arranged to occupy substantially a single plane so that the parts may be passed through a restricted opening in the casing.

In witness whereof, I hereunto subscribe
110 my name this 14th day of April, A. D. 1910.

AXEL F. LARSON.

Witnesses:

ARTHUR H. BOETTCHER,
ALBERT C. BELL.