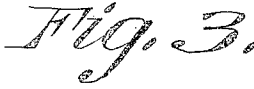
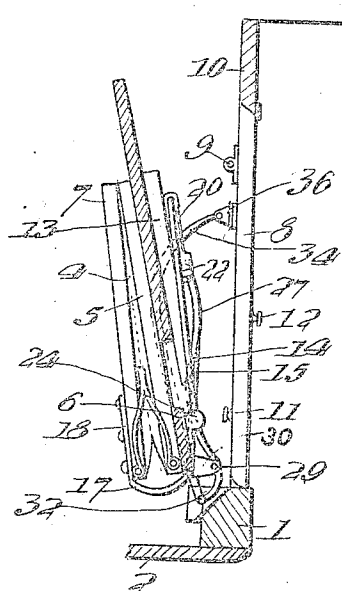
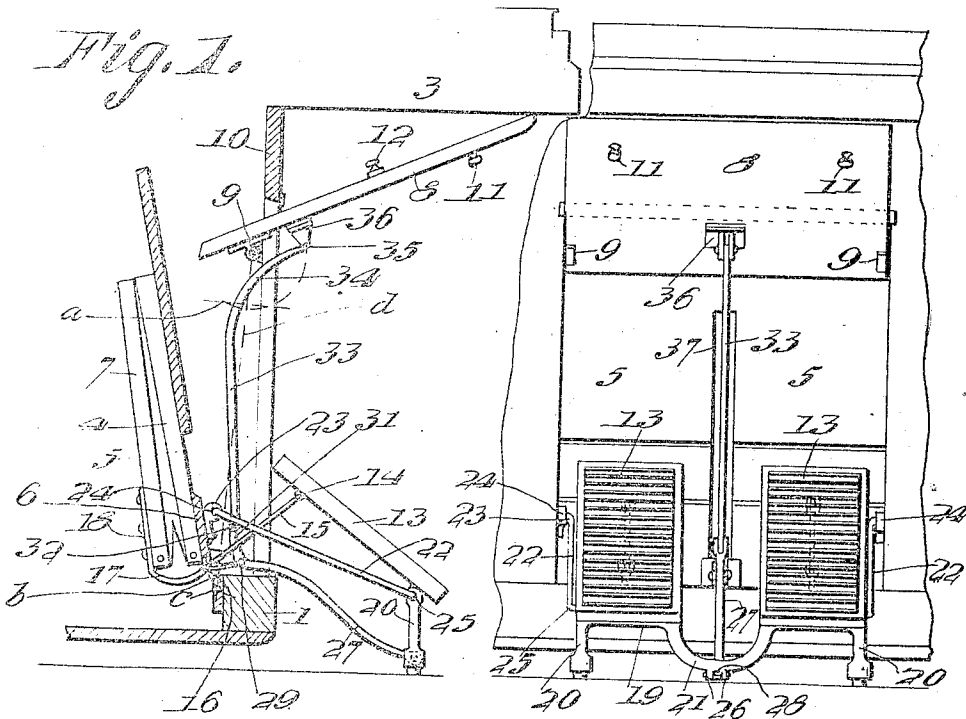


1,021,571.

Patented Mar. 26, 1912.

2 SHEETS—SHEET 1.



Witnesses
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F. W. Ernst

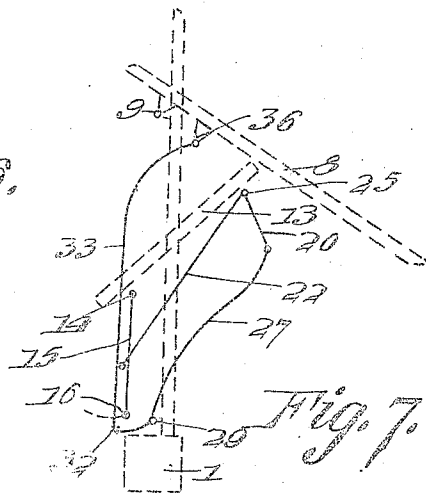
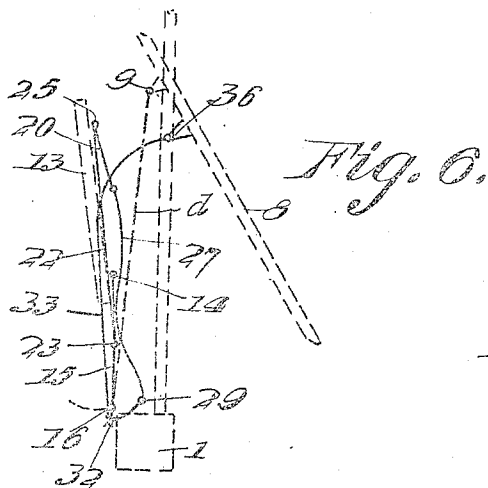
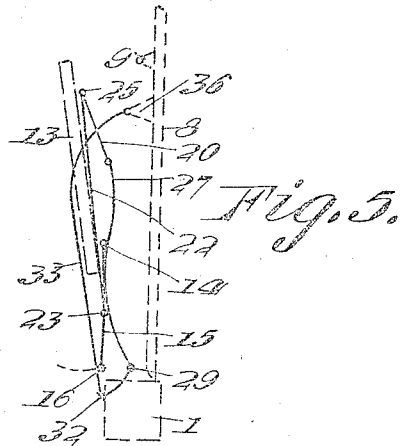
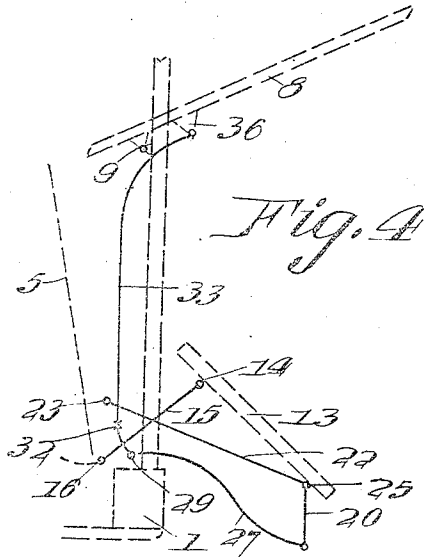
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G. P. BRAND & J. SANTOS.
DOOR AND PEDAL OPERATING MECHANISM.
APPLICATION FILED MAY 2, 1910.

1,021,571.

Patented Mar. 26, 1912.

2 SHEETS-SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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BEHNING PIANO COMPANY, A CORPORATION OF NEW YORK.

DOOR AND PEDAL OPERATING MECHANISM.

1,021,571.

Specification of Letters Patent.

Patented Mar. 26, 1912.

Application filed May 2, 1910. Serial No. 558,790.

To all whom it may concern:

Be it known that we, GEORGE P. BRAND and JOHN SANTOS, citizen of the United States of America and subject of the King of Italy, respectively, and residents of New York, in the county and State of New York, have invented certain new and useful Improvements in Door and Pedal Operating Mechanism, of which the following is a

specification.
This invention relates to certain new and useful improvements in door and pedal operating mechanism for pedal-operated devices, such for instance as piano players and other automatic musical instruments.

It has for its objects among others to provide a simple yet efficient and durable and reliable mechanism whereby the door and pedals are actuated simultaneously and the pedals folded within the casing within minimum space, the door following the same and assisted to its closed position and there held by the means connecting the door with the pedals.

Another object of the invention is to so construct and arrange the parts that the door shall fold in one direction and the pedals in the opposite direction, the door serving as the motive means for actuating the parts to throw the pedals in and out of the casing.

Another object of the invention is to construct the pedal frame to allow of the compact folding of the parts one behind the other, and to allow of permanent connection between the parts.

Still a further object is to so arrange the parts that the pivotal point of attachment of the door with its connecting member shall be passed by the pivotal point of connection with the pedal frame at its center just prior to the final closing of the door so as to cause a slight spring or cam movement to suddenly throw the door to its closed position after these pivotal points pass their point of crossing. The connections are such that the legs of the pedal frame are caused to assume substantially a vertical position throughout the entire movement and cause them to fold in behind the door and against

the exhausters prior to the final closing of the door so as to be entirely out of the way of the latter. The parts are so nicely proportioned and timed in their movements that there is no conflict one with the other, and undue friction is avoided, so that the door and pedals are moved easily into either their open or their closed position. The construction is such that the pedals serve to hold the door in its open position and the door holds the pedals in their closed position.

We provide also an improved form of pedal frame, substantially U-shaped at its center for the connection of the arm therewith at the center and at a point low down in order to give us the necessary movement to close the pedals within the small space provided.

Other objects and advantages of the invention will hereinafter appear and the novel features thereof will be specifically defined by the appended claims.

The invention, in its preferred form, is clearly illustrated in the accompanying drawings, which, with the numerals of reference marked thereon, form a part of this specification, and in which—

Figure 1 is a side elevation with the pedals and door in their open position. Fig. 2 is a front elevation with the parts in the same position. Fig. 3 is a vertical section from front to rear with the parts in their closed position. Fig. 4 is a diagrammatic view showing the relative positions of the pivotal connections, the parts being indicated as in their open position. Fig. 5 is a similar view with the parts indicated in their closed position. Fig. 6 is a similar view showing the position of the parts just prior to the time the door assumes its full closed position, the pedals and their immediate connections being in substantially the same position with relation to the exhausters as they are in Fig. 5. Fig. 7 is a similar view showing the position of the parts and pivotal points when the door is partly closed and the pedals partly folded.

Like numerals of reference indicate like parts throughout the several views.

Referring to the drawings, 1 designates the bottom rail of a piano, 2 the bottom board, 3 the key bed and 4 the exhausters of any well-known or approved form of construction. The stationary member 5 of the exhauster is supported in any of the well-known ways, as upon a plate 6 fastened to the bottom rail 1.

7 is the movable member of the exhauster. 8 is the door. It is pivotally mounted or hinged, as at 9, see Fig. 1, back of the bottom frame 10, the pintles of the hinges being offset, as seen clearly in Fig. 1, so as to bring the same sufficiently far back within the case to allow of the operation of the parts as the door is opened or closed. The door is provided upon one side with a knob or the like 11 and upon the opposite side with a knob or the like 12, for obvious purposes.

13 are the pedals. The inner or upper end has pivotally connected thereto, as at 14, one end of a link 15, and the other end of said link is pivotally connected, as at 16, with the arm 17 secured at 18 in any well-known way to the movable member 7 of the exhauster and projecting forward, as shown.

19 is the pedal frame. It is provided with feet 20 at opposite ends and at its center is depressed, in this instance being shown substantially as U-shaped, as indicated at 21.

22 are the side arms pivotally mounted, as at 23, to a bracket, lug or the like 24 secured to the exhauster plate or some stationary part. The other ends of the side arms extend horizontally, as seen in Fig. 2 at 25, and serve as the centers on which the frame and the pedals turn, it being understood that there is a side arm upon each outer side of the two pedals, as seen clearly in Fig. 2.

The pedal frame 19 has at its center, in this instance at the center of the U-shaped portion 21, ears or the like 26 between which is received the lower end of the arm 27 which is secured therein by suitable bolt or the like 28 which serves as the pivot of said arm. This arm is pivotally mounted, as at 29, to a bracket or the like 30 secured to the plate 6 or some analogous fixed portion of the device. It has a short arm 31 extending rearwardly, when the pedals are in their open position upwardly, and to the end thereof is pivotally connected, as at 32, the lower end of a link 33, the upper end of which is curved forwardly, as seen at 34, and the extremity thereof is pivotally connected, as at 35, to a bracket or the like 36 on the under side of the door at a short distance from the hinges of the latter. The link 33 is designed to move in a space 37 between the exhausters, as seen clearly in Fig. 2.

In operation, when the door is open, as indicated in Fig. 1, the pivotal point 32 is in advance or in front of the hinges 9 of the

pedals, the feet 20 stand substantially vertical and rest upon the floor, the pedals being in their natural inclined position. The connecting arms 22 stand at an angle to the feet and the links 27 and 33 stand in the relative positions shown; the pivot 32 joining these two links being out of vertical alinement with the pivots 29 and 35. In this position, the location of the parts is such that the pedals tend to hold the door in its opened position. When it is desired to close the door and fold the pedals, continued pressure upon the outer edge of the door applies force at the point 35, causing the same to move in the curved path *a*, and immediately upon the application of power at such point, the pivot 32 moves in the curved path *b*, the link 27 being pivotally connected to the pedals and pivotally supported at 29. The pivotal point 32 in traveling the curved path *b* starts the pedal frame upward and as the pivotal point 32 reaches the lower end *c* of its curved path, the pivotal point 32 has practically come to a stop, reaching its destination as the pedals are now thrown against the stationary board of the exhausters, as shown in Fig. 6, and the pivotal point 9 also being stationary, the door is held out from the case at an angle, as shown in said view, for the reason that the pivotal point 35 is traveling on a circle and has not yet reached its destination. Consequently, the door is going to stop for the reason that the pivotal point 32 ceases to go any farther. A little more pressure on the door forces the pivotal point 35 past the dead center, indicated by the line *d* seen in Fig. 1, and passing the dead center point, the same force is again applied automatically to close the door to hold it in its position, passing from the dead center to its destination. The distance from the said dead center line to the final destination of the pivot 35 is less than the distance from said line to the point where the resistance takes place between the center points. During the folding movement of the pedals and the closing movement of the door, the pedals must necessarily fold prior to the closing of the door and the feet 20 must also fold so as to be out of the way of final movement of the door. There is a critical point during these movements which is illustrated in Fig. 7. As the parts leave this position, by reason of the fact that the pedals and their connection must fold inward before the door comes to its vertical position, there is a time when the door and pedals are practically opposed. As these pass each other and assume the position seen in Fig. 8, there is sufficient yield or spring to the parts, after the manner of a reflex action, to give increased impetus to the door and tend to pull the same to its closed position, which is that indicated in Fig. 6.

Figs. 4 to 7 illustrate diagrammatically the relative positions of the different parts which they assume in the change of position in which the door is opened and the pedals distended to the folding of the pedals and the entire closing of the door. The door may be closed and the pedals folded by a sudden quick movement of the door downward, the momentum of the parts serving to take the pivotal points past the dead center with one movement. In opening the door, a quick movement upon the same by grasping the knob 12 serves to give initial impulse to the door and to the pedals and after the pivotal points have moved forward beyond the dead center, the weight of the pedals serves to assist in the opening movement, and when the parts assume the position indicated in Fig. 1, the weight of the pedals acts to hold the door in its open position and against closing.

Modifications in details may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages.

What is claimed as new is:—

1. A door having means for pivotally mounting it, a pedal support having means for pivotally mounting it, pedals pivotally mounted on said support, and means directly and pivotally connecting said door and support.

2. A door having pivoting means, a member pivotally connected to the door near its pivoting means, pedals, a movable support for said pedals, and a direct pivotal connection between said member and support.

3. The combination of a casing, a door mounted at its upper edge on a fixed pivot on said casing, a swinging support, a pedal mechanism mounted thereon, and means pivotally connecting said door and support for moving said support into the casing.

4. A casing, a door having means for pivotally mounting it on said casing, a pedal support having means for pivotally mounting it, pedals pivotally mounted on said support, and means directly and pivotally connecting said door and support for moving said support into the casing in advance of the door.

5. A casing, a door having means for pivotally mounting it on said casing, a pedal support having means for pivotally mounting it, pedals pivotally mounted on said support, and means directly and pivotally connecting said door and support for moving said support in advance of and by the movement of the door.

6. The combination of a casing, a door mounted at its upper edge on a fixed support on said casing, a swinging support, a pedal mechanism mounted thereon, and means directly pivotally connected with

said door and directly with said support for moving the latter into the casing.

7. A door having means for pivotally mounting it, a pedal support having means for pivotally mounting it, pedals pivotally mounted on said support, and yielding means directly and pivotally connecting said door and support.

8. A door having means for pivotally mounting it, a pedal support having means for pivotally mounting it, pedals pivotally mounted on said support and means directly and pivotally connecting said door and support and constituting with a member of said support yielding means.

9. A door having means for pivotally mounting it, a pedal support having means for pivotally mounting it, pedals pivotally mounted on said support and means directly and pivotally connecting said door and support and constituting with a member of said support yielding means for holding the door in its open and closed positions.

10. Pedals, a pedal support having one of its members mounted on a fixed pivot, a door mounted on a fixed pivot, a member pivoted at one end to said door and at the other end to said member of the pedal support, said members constituting yielding means for holding the door in its closed position.

11. Pedals pivotally mounted to fold, a door pivotally mounted near one edge, members pivotally joined together and respectively connected directly to the door and to a member of the pedal mount, said members constituting yielding means for holding the door in its open and closed positions.

12. Pedals pivotally mounted to fold, a door mounted to move simultaneously therewith, means pivotally connected at one end with the door and at the other end pivotally connected with one member of the pedal mount for causing the pedals to assume their final position before closing of the door and automatically giving impetus to the door after the pedals reach their final position.

13. Pedals pivotally mounted to fold, a door mounted on a fixed pivot, means including pivotal connections between the door and pedals for folding the pedals and causing them to assume their final position before final closing of the door and constructed to automatically give impetus to the door after the pedals reach their final position.

14. Pedals pivotally mounted to fold, a door mounted on a fixed pivot, means including pivotal connections between the door and pedals for folding the pedals and causing them to assume their final position before final closing of the door and constructed to automatically give impetus to the door

after the pedals reach their final position and to hold the door in its closed position.

15. Pedals pivotally mounted to fold, a door mounted to move simultaneously with
5 said pedals, means including pivotal connections between the door and pedals for folding the pedals and causing them to assume their final position before final closing of the door and automatically giving impetus
10 to the door after the pedals reach their final

position, portions of said means serving to hold the door in its open position.

Signed by us at the city of New York this 28 day of April 1910.

GEORGE P. BRAND.
JOHN SANTOS.

Witnesses:

WALTER FRANK,
GUSTAVUS BEHNING.