

A. G. GULBRANSEN.
 PEDAL MECHANISM.
 APPLICATION FILED FEB. 21, 1908.

936,447.

Patented Oct. 12, 1909.
 2 SHEETS—SHEET 1.

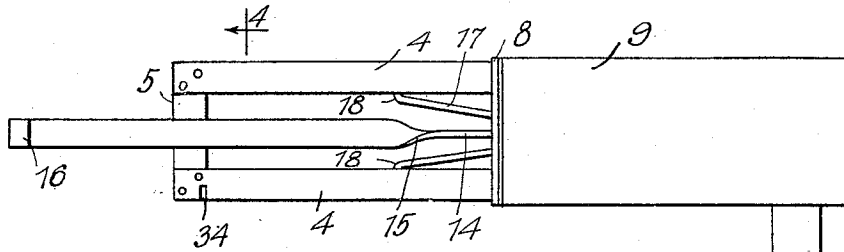


Fig. 1.

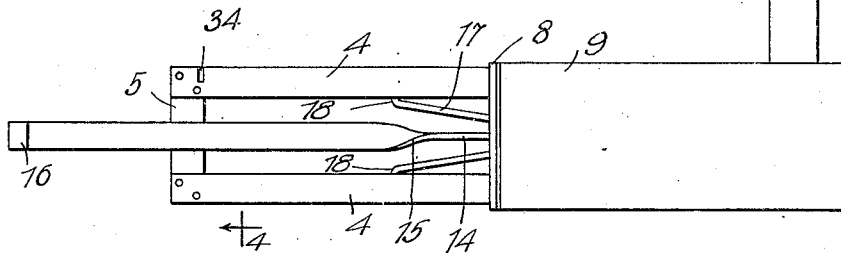
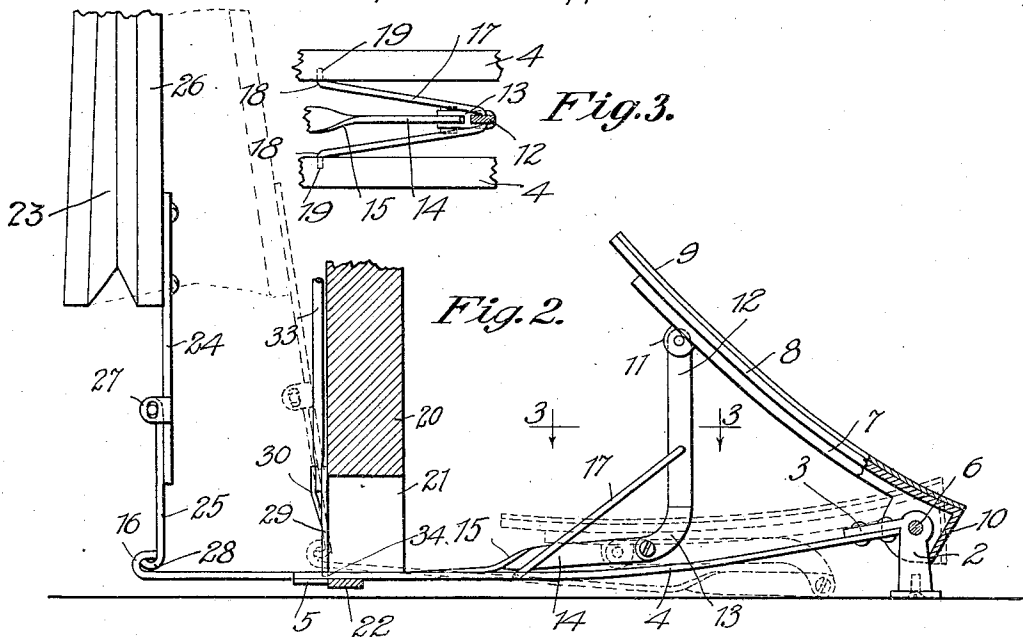


Fig. 2.



Witnesses:
 Leonard W. Novander,
 Charles J. Schmidt,

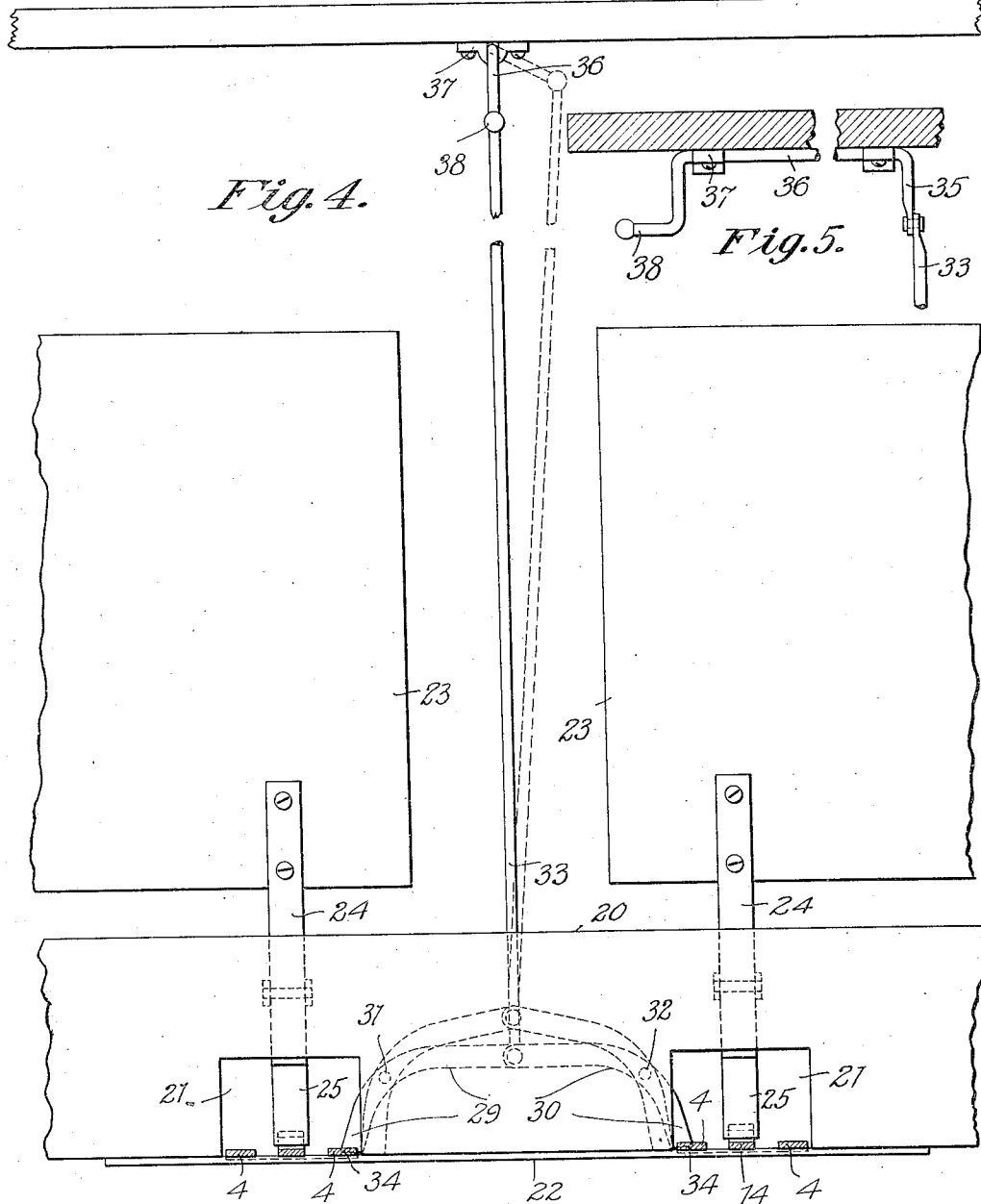
Inventor
 Axel G. Gulbransen
 By Brown & Williams
 Attorneys

A. G. GULBRANSEN.
 PEDAL MECHANISM.
 APPLICATION FILED FEB. 21, 1908.

936,447.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 2.



Witnesses:
 Leonard W. Novander,
 Charles J. Schmier.

Inventor
 Axel G. Gulbransen
 By *Mason & Williams*
 Attorneys

UNITED STATES PATENT OFFICE.

AXEL G. GULBRANSEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO GULBRANSEN-DICKINSON COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

PEDAL MECHANISM.

936,447.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed February 21, 1908. Serial No. 417,187.

To all whom it may concern:

Be it known that I, AXEL G. GULBRANSEN, 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, 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 pedal mechanism for pneumatically operated instruments such as pianos, the object being to provide simple and efficient detachable pedal mechanism, which can easily be applied and manipulated.

My invention belongs to that class of pedal mechanisms which, when not in use, are below or within the piano casing and which, when to be used, are drawn forwardly into position in front of the piano.

In the accompanying drawings I have illustrated my invention, Figure 1 being a top view of the pedal mechanism, Fig. 2 being a side view showing the pedal mechanism in place and applied for operation, part of the pedal and part of the piano case being broken away; Fig. 3 being a partial sectional view taken on plane 3, 3 of Fig. 2; Fig. 4 being a front view of the lower middle section of a piano frame showing the pedal mechanism in place, the pedal mechanism being cut away along the line 4, 4 of Fig. 1, and Fig. 5 being a side view of the controlling handle for the locking mechanism.

The pedal mechanism supporting frame comprises the horizontal, flat bar 1, at whose ends extend upwardly two sets of pivot posts 2. From each pivot post an arm 3 extends rearwardly and a flat rod 4 is secured to each arm 3, the rods 4 being parallel and extending rearwardly, the two rods of each set being connected together at the inner end by a cross piece 5. Pivoted between each set of posts 2 on a pivot shaft 6 is a supporting frame 7 of sheet metal, which supports the metallic pedal base or board 8 to whose surface is applied a rubber pad 9, as shown. The end 10 of board 8 extends downwardly, as shown, for a purpose which will appear later. Near the end of the frame 7 are bearing lugs 11, between which is pivoted the upper end of a link 12 having a rearwardly curved lower end 13, which is pivoted to the

outer end of a flat rod 14. The rod is given a ninety degree twist at 15, its rear end lying flat and engaging the cross piece 5 between the two rods 4. The inner end of each connecting rod 15 is turned up to form a hook 16. The link 12 at an intermediate point is pivoted to the end of the link frame 17 whose ends 18 are bent outwardly and engage in bearing holes 19 in the inner edges of the rods 4. This link frame is preferably of wire, so it may be slid through the pivot opening in the link 12 and its pivot ends 18 sprung into the pivot holes 19, the arrangement being best shown in Fig. 3.

To accommodate the pedal frame, the base-board 20 of the piano case has slots 21 cut in its lower edge and secured below the rear half of the edge of this board and crossing the slots is a metal bar 22. Within the piano casing and suitably mounted are two feeder bellows 23, from each of which extends an actuating rod formed of upper and lower members 24 and 25. The upper member is secured to the movable part 26 of the feeder bellows and has pivot ears 27 extending rearwardly therefrom at a point between the end of the rod and the bellows. The lower member 25 is pivoted at its upper end between these ears 27 and its lower end has the hook 28, which engages with the hook 16 of the corresponding pedal connecting rod 14. The member 25 normally rests against the lower end of upper member 24 and when the connecting rods 14 are pulled outwardly, the upper and lower members 24 and 25 form a rigid connecting link between the connecting rods and the feeder bellows. When the pedals are in position to be used, as shown in the various figures, the supporting frame 1 and the bars 4 are pulled outwardly until the cross bars 5 lock against the rear edge of the metal bar 22. In this position, the feeder bellows are collapsed and the hooks 16 engage with the hooks 28. The pedals are in their upper position as best shown in Fig. 2 with the links 12 extending in a vertical direction. Now, when pressure is applied to the pedals, the links 12 are moved downwardly and the connecting link frame 17 is rotated, this rotation causing the links 12 to swing forwardly to draw with them the connecting rods 14 and to swing the members 24 and 25 to cause distention of the feeder bellows and creation of suction, which is used for driving the various

pneumatic mechanisms of the automatic piano. The feeder bellows are supplied with return spring mechanism, as is well known in the art, and upon release of the pedals the connecting rods 14 will be drawn inwardly to the normal position, and the pedals again raised. The arrangement of these various links and connecting rods as described gives considerable leverage, and very light pressure on the pedals will cause the feeder bellows to be driven with great force. To hold the pedal mechanism rigidly in place, the locking mechanism best shown in Figs. 4 and 5 is provided. This mechanism comprises two toggle members 29 and 30, pivoted to the rear of the baseboard at 31 and 32, respectively, and having their inner ends pivoted together and to an upright rod 33. The outer ends of these toggle levers extend downwardly adjacent to lock notches 34 cut in the edges of the inner rods 4 of the pedal frame. The top of the rod 33 is pivoted to the end of the inner leg 35 of a U-shaped crank lever 36 pivoted in bearings 37 suitably secured to some part of the piano casing, the other leg of the crank lever having the operating handle 38. The unlocked position of the locking parts is shown in dotted lines in Fig. 4, the handle 38 being swung upwardly, as shown, to swing the toggle members about their pivots and to carry the locking ends out of the path of the locking notches 34. However, when the pedal frame is drawn out, then the handle 38 is swung downwardly to cause downward movement of the rod 33 and swinging of the toggle members to carry their locking ends into the locking slots 34, thus to lock the pedal frame against displacement when the pedals are operated.

When the pedals are to be restored to their normal position, the crank frame is rotated to its normal position to release the toggle members at the locking slots, and the pedal frame is merely pushed inwardly. The weight of the pedals has a tendency to cause downward movement of the links 12 and rotation of the link frame 17 to cause collapse of the pedals, but when the pedals are in their operative position, this is prevented by engagement of the connecting rods with the feeder bellows actuating rod members 25. However, when the pedal frame is pushed inwardly the opposition of the members 25 will be removed, and the pedals will gradually drop and the various parts will assume the position shown in dotted lines just before the ends of the pedals reach the slots 21. When the pedals have thus collapsed and all parts assumed their folded position, the pedals can be easily pushed through the slots 21 into the piano casing, the hooks 28 finally disengaging from the hooks 16.

When the pedal mechanism is folded, the

outer ends of the connecting rods are lower than the bar 22 over which the rods slide and therefore, when the pedals are pushed through the slots 21, the rear ends of the connecting rods will swing upwardly. The hook members 25, however, being hinged, will swing rearwardly and allow such upward swing of the connecting rods. There will also be more or less irregular movement of the parts as they are slid into the casing, but to prevent binding the pivot holes in the ears 27 extending from members 24 are elongated vertically, so as to still further reduce the resistance to the upward swing of the connecting rods. The use of the slotted pivots also gives greater leeway in the application of pedal mechanism to a piano casing, making it unnecessary to spend too much time on accurate adjustments.

When the pedal frame is in proper position within the piano casing, the supporting bar 1 will engage below the front half of the lower edge of the baseboard, and the downwardly extending parts 10 of the pedal frame will form closures to close the slots 21, giving a very neat appearance. When the pedals are again to be used, the pedal frame is pulled outwardly and the hook members 25 being in the path of the outwardly moving rods 14, will be again engaged by the hooks 16 so that when the pedals are fully withdrawn and the toggle locking members applied, the pedals can again be operated.

If it is desired to entirely remove the pedal mechanism from the piano, this can easily be done by lifting up the outer end of the pedal frame when in its out position, so that the hooks 16 will be disengaged from hooks 28 and the entire pedal frame can be removed.

A very neat, simple and efficient pedal mechanism is thus provided, which has a minimum number of parts. No complicated manipulation is necessary to bring the pedal mechanism into operative position, as is the case in some pedal mechanisms of the prior art of which I am aware and in which various parts must be manually connected together and adjusted before the pedals can be operated. In my arrangement any part of the pedal frame may be grasped, and by merely pulling out the frame the proper connection is made with the power bellows, and the pedals automatically moved to their distended position ready for use. When through using, the hands are placed against the front ends of the pedal frames and the entire structure pushed inwardly, the pedals upon such inward movement falling and folding with the other connecting parts into compact arrangement, the parts finally entering the slots cut in the piano casing, and the ends of the pedals forming neat closures for closing the slots.

Having thus described my invention, I desire to secure the following claims by Letters Patent:

1. In pedal mechanism for pneumatically operated pianos, the combination of bellows mechanism to be actuated, a pedal, a supporting frame to which said pedal is pivoted, a link extending downwardly from said pedal, a connecting rod extending from said link for engagement with the bellows mechanism, and a link frame pivoted to said link and to said supporting frame, depression of the pedal causing longitudinal movement of the connecting rod.

2. In pedal mechanism for pneumatically operated pianos, the combination of a supporting frame, a pedal pivoted at one end to said frame, a horizontally arranged connecting rod, a link connecting one end of said rod with the free end of the pedal, and a link frame pivoted to the supporting frame and to the link at an intermediate point, whereby swinging of the pedal will cause longitudinal movement of the connecting rod.

3. In pedal mechanism for pneumatically operated pianos, the combination of a supporting frame, a pedal pivoted at one end of the supporting frame to be swung vertically, a link depending from the pedal, a link frame pivoted stationarily at one end and having pivotal connection at its other end with said link so that vertical swinging of the pedal will cause longitudinal swinging of the link, and a connecting rod connected with the link to be horizontally reciprocated therewith.

4. In pedal mechanism for pneumatically operated pianos, the combination of a horizontal supporting frame, a pedal pivoted at one end of said frame to be swung toward and from said frame, a link pivoted at one end to the pedal, a second link pivoted at one end to the horizontal frame and its other end being pivoted to the link extending from the pedal, said links being caused to swing when the pedal is moved toward the frame, and a connecting rod pivoted to the link extending from the pedal to be reciprocated horizontally upon swinging of the pedal.

5. In pedal mechanism for pneumatically operated pianos, the combination of a horizontal supporting frame, a pedal pivoted at one end to said frame, a link pivoted to and extending from the pedal, a second link pivoted at one end to the supporting frame and pivoted at its other end at an intermediate point of the link extending from the pedal, said links being inclined toward the pivot end of the pedal so that movement of the pedal toward the supporting frame will cause the free end of the pedal link to be moved longitudinally toward the pedal pivot end, and a connecting rod pivoted to the

free end of the pedal link to be longitudinally reciprocated upon vertical swinging of the pedal.

6. In combination, a piano casing having a baseboard provided with a slot in its lower edge, feeder bellows within the casing, pedal mechanism at the outside of the casing, a horizontal connecting rod extending from the pedal mechanism through the slot and having engagement with the feeder bellows, said pedal mechanism being adapted to be folded to a position parallel with the connecting rod and to be slid through the slot into the casing.

7. In combination, a piano casing having a vertical baseboard provided with an opening, feeder bellows within the casing, a horizontal pedal supporting frame at the outside of the casing, a pedal pivoted at one end of said supporting frame, a horizontal connecting rod extending through the opening and having connection with the feeder bellows, a link connecting the pedal with the outer end of the connecting rod, a second link connecting the first link with the supporting frame so that downward movement of the pedal will cause outward longitudinal movement of the connecting rod and actuation of the feeder bellows, restoration means tending to cause said connecting rod to be pulled inwardly upon release of the pedal and actuation of the links to raise the pedal to its normal position, the weight of the pedal and links causing collapse thereof when the supporting frame is moved inwardly to release the connecting rod from the feeder bellows, said pedal and links folding against the supporting frame and connecting rod upon collapse of the bellows so that the entire structure can be moved through the opening and into the interior of the casing.

8. In combination, a piano casing having a baseboard provided with a slot in its lower edge, feeder bellows within the casing, a pedal at the outside of the casing, a horizontal connecting rod extending through the slot and having engagement with the feeder bellows, means connecting the pedal with said connecting rod, said pedal adapted to be folded to a position parallel with the connecting rod and to be slid through the slot into the casing, the pedal having a part forming a closure for the slot when the pedal has been moved into the casing.

9. In combination, a piano casing having a vertical baseboard, an opening through said baseboard at the lower edge thereof, feeder bellows within the casing, a pedal supporting frame at the outside of the casing, a pedal pivoted to said frame, a horizontal connecting rod extending through the opening and having connection with the feeder bellows, a link connecting the outer end of the connecting rod with the bellows, a second link connecting the first link with

the frame so that vertical reciprocation of the bellows will cause longitudinal reciprocation of the connecting rod and actuation of the feeder bellows, and means for normally holding the connecting rod in its inner position and the pedal in its upper position, movement of the frame toward the opening causing said means to release the connecting rod whereby the pedal may fall to its lower position, said pedal supporting frame, links and connecting rod being adapted when the pedal is in its down position to be moved together through the opening and into the casing, the connecting rod upon such inward movement becoming disengaged from the feeder bellows.

10. In pedal mechanism for pneumatically operated pianos, the combination of mechanism to be actuated, a pedal pivoted at one end, a link extending downwardly from the pedal, a second link pivoted at one end and its other end being pivoted to the first link so that said first link will swing upon swinging of the pedal, and a connecting rod having connection with the mechanism and connected with the first link to be reciprocated thereby to cause actuation of the mechanism.

11. In combination, a piano casing having a vertical wall, feeder mechanism within the casing, there being an opening through said wall near the lower edge thereof, a horizontal supporting frame normally outside the casing in front of the opening, a pedal pivoted at one end to the frame, a horizontal connecting rod extending through the opening and having connection with the feeder bellows, connecting means for transforming swinging of the pedal into longitudinal reciprocation of the connecting rod whereby the feeder bellows is actuated, said pedal when depressed being parallel with the supporting frame so that the supporting frame, connecting mechanism and pedal may be moved through the opening into the interior of the casing, and a wall extending from the pedal for forming a closure for the opening when the parts have been moved to the interior of the casing.

12. In combination, a piano casing having a vertical wall provided with an opening near its lower edge, a feeder bellows within the casing, a horizontal supporting frame at the outside of the casing in front of the opening, having its inner end normally extending through the opening, pedal mechanism supported on said frame, a connecting rod passing through the opening for connecting the pedal mechanism with the feeder bellows, and locking mechanism supported from the casing and adapted for engagement with the frame to hold said frame in its outer position.

13. In combination, a piano casing having a vertical wall provided with an opening near its lower edge, a feeder bellows within

the casing, a horizontal supporting frame at the outside of the casing in front of the opening, having its inner end normally extending through the opening, pedal mechanism supported on said frame, a connecting rod passing through the opening for connecting the pedal mechanism with the feeder bellows, locking mechanism supported from the casing and adapted for engagement with the frame to hold said frame in its outer position, the end of the frame being provided with a slot, and a locking member pivoted to the front wall and adapted to be moved into said slot to lock the frame in its outer position.

14. In combination, a piano casing having a front wall provided with two openings near its lower edge, feeder bellows within the casing, a supporting frame at the outside of the casing having ends normally extending through the openings, pedal mechanism supported on the frame, connecting rods passing from said pedal mechanism through the openings and having connection with the feeder bellows, toggle members pivoted to the front wall, and means for locking said toggle members into locking engagement with the ends of the supporting frame.

15. In combination, a piano casing having a front wall provided with two openings near its lower edge, feeder bellows within the casing, a supporting frame at the outside of the casing having ends normally extending through the openings, pedal mechanism supported on the frame, connecting rods passing from said pedal mechanism through the openings and having connection with the feeder bellows, the ends of the frame projecting through the openings being provided with slots, toggle members pivoted to the front wall between the openings, and means for moving the toggle members into said slots to lock the frame in its outer position.

16. In combination, a piano casing, feeder bellows within the casing, a pedal outside the casing adapted to be swung vertically, a horizontal connecting rod having connection with the feeder bellows and with the pedal, and means for causing outward longitudinal movement of the connecting rod and actuation of the bellows upon depression of the pedal.

17. In combination, a piano casing, feeder bellows within the casing, a hooked actuating member having hinge connection with the feeder bellows, means for preventing said hooked member from swinging in one direction, a connecting rod at right angles with the hooked member and having a hook for engaging the hooked member, pedal mechanism at the outside of the piano casing, means adapted upon swinging of the pedal for causing longitudinal reciprocation of the connecting rod to swing the hooked

member and to actuate the bellows, the wall of the casing having an opening and said pedal mechanism being adapted to be folded to be inserted through the opening into the casing, the hinge member upon such inward movement of the pedal mechanism being swung and disconnected from the hook on the connecting rod.

18. In combination, a piano casing having a front wall provided with an opening, a feeder bellows stationarily mounted within the casing, a hooked actuating member for the bellows, a pedal at the exterior of the casing, a horizontal connecting rod extending through the opening, said connecting rod having hooked connection with the hooked member and at its outer end having connection with the pedal, means adapted upon vertical swinging of the pedal for caus-

ing longitudinal reciprocation of the connecting rod and actuation of the bellows, said pedal and means being adapted to fold together with the connecting rod so that these parts can be moved through the opening into the exterior of the casing, said hooked actuating member having hinge connection with the feeder bellows and having longitudinal play whereby said hooked member may easily disengage from the connecting rod upon inward movement of the pedal mechanism parts.

In witness whereof, I hereunto subscribe my name this 4th day of February A. D., 1908.

AXEL G. GULBRANSEN.

Witnesses:

CHARLES J. SCHMIDT,
GEORGE E. HIGHAM.