

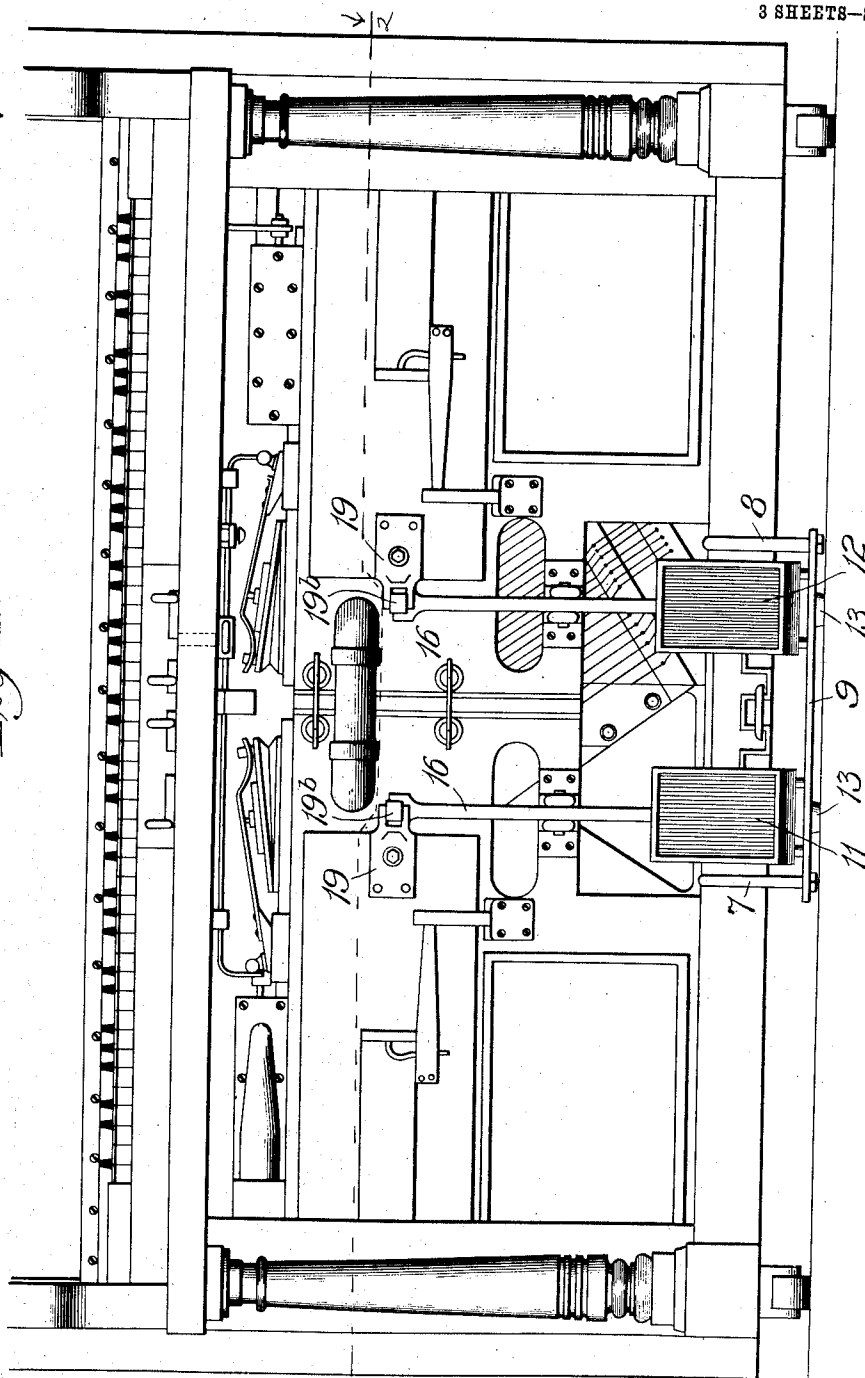
No. 874,408.

PATENTED DEC. 24, 1907.

P. B. KLUGH.
PEDAL MECHANISM.
APPLICATION FILED JUNE 21, 1907.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

Edw. E. Ayford,
John Enders.

Inventor:

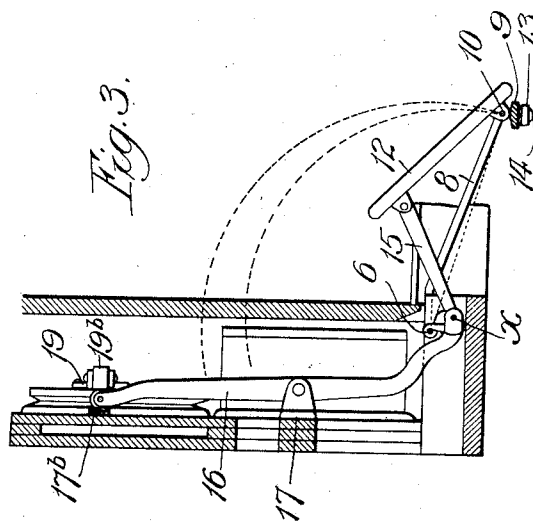
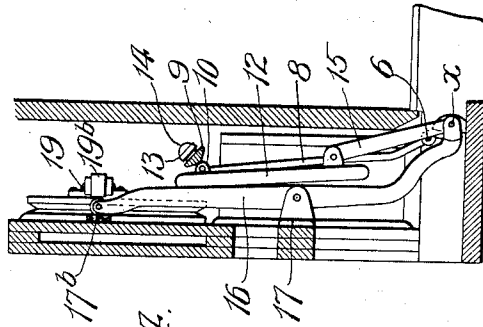
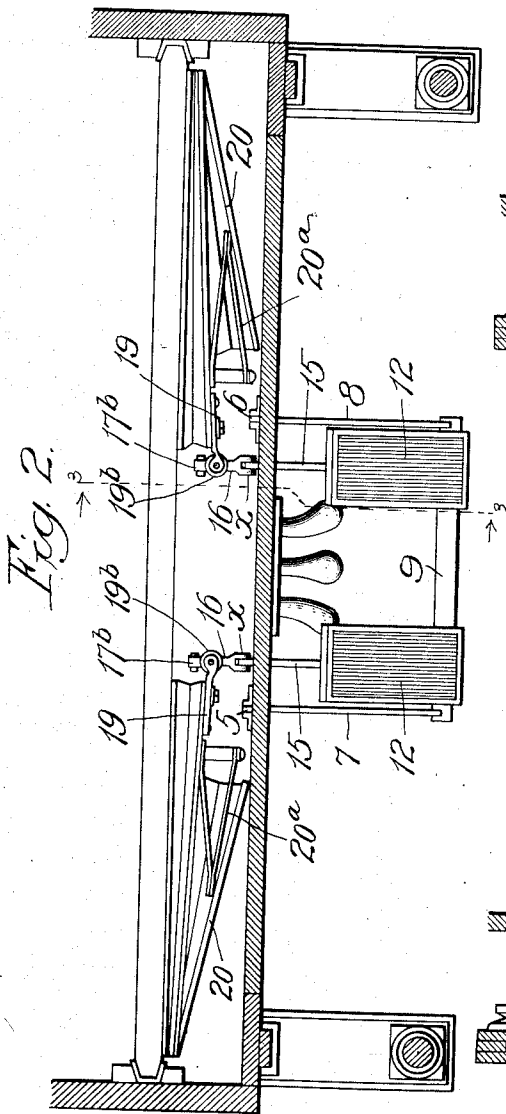
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3 SHEETS—SHEET 2.



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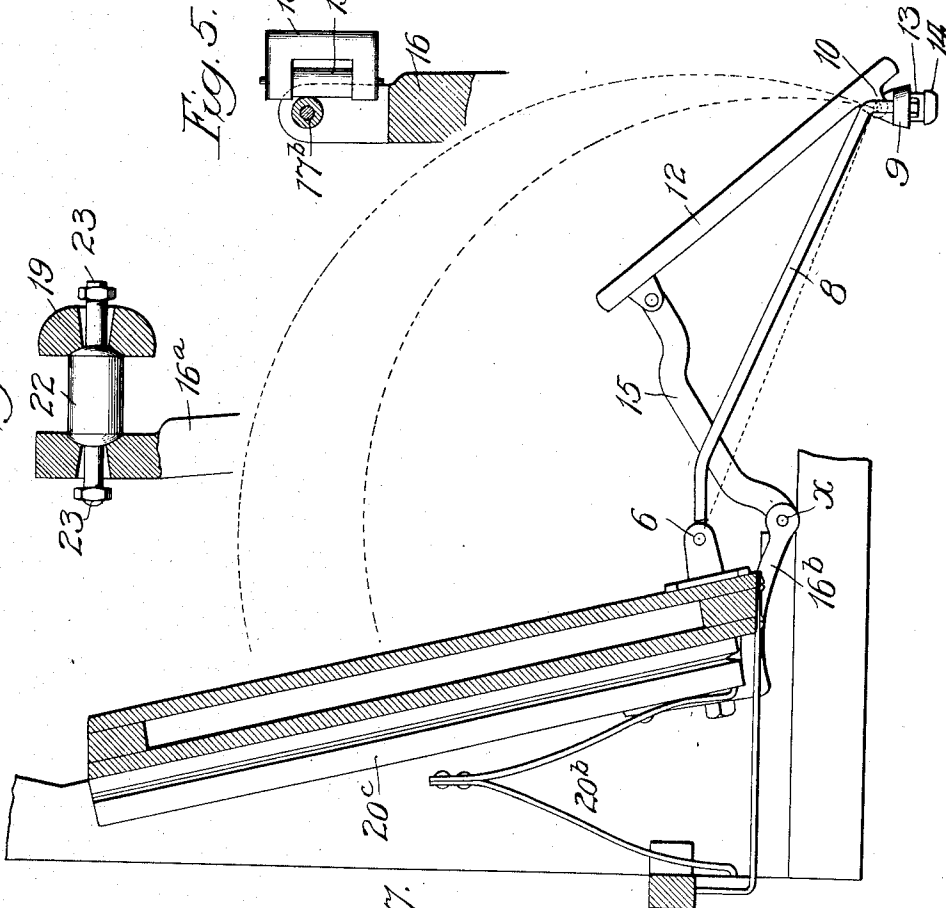
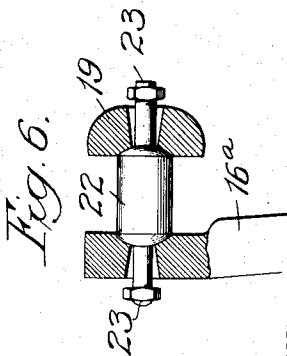
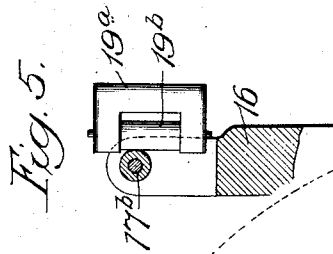
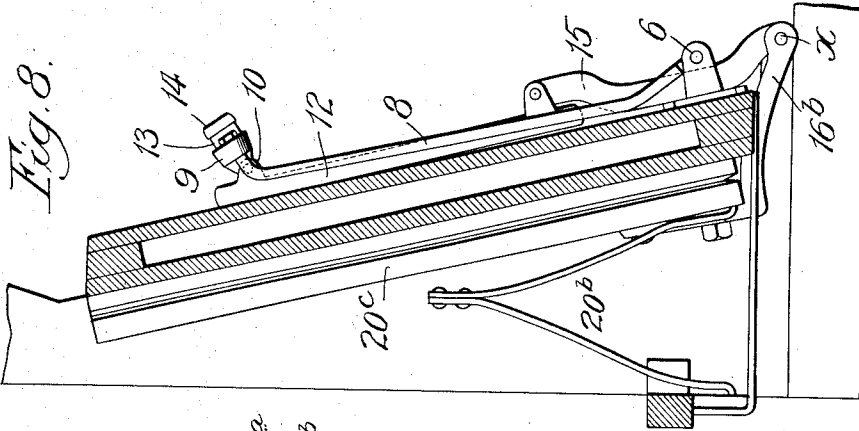
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PEDAL MECHANISM.

APPLICATION FILED JUNE 21, 1907.

3 SHEETS—SHEET 3.



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Fig. 7.

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UNITED STATES PATENT OFFICE.

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PEDAL MECHANISM.

No. 874,408.

Specification of Letters Patent.

Patented Dec. 24, 1907.

Application filed June 21, 1907. Serial No. 380,082.

To all whom it may concern:

Be it known that I, PAUL BROWN KLUGH, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Pedal Mechanism, of which the following is a specification.

My invention relates to pedal mechanism, and is especially adapted for use on the bellows of musical instruments.

The object of the invention is to provide powerful and easily operated pedal mechanism which may be folded into a very small space by merely lifting the treadle base without knocking down the treadles or making other preliminary disposition of the parts and as readily withdrawn from the instrument and set in operative position.

The invention also contemplates certain improvements in the arrangement of the parts, including a novel arrangement of the swinging bellows lever and its connection through intermediate parts to the treadle.

In the accompanying drawings, I have shown a device embodying my invention in its preferred form, and have shown several modifications of various parts of the device.

Figure 1 is a front elevation of the lower portion of an interior piano player with the front board removed, showing pedal mechanism embodying my invention attached thereto; Fig. 2 is a reduced broken sectional plan view on line 2 of Fig. 1; Fig. 3 is a broken vertical view on line 3 of Fig. 2, showing the mechanism in the unfolded or operative position; Fig. 4 is a similar view on line 3 of Fig. 2, showing the mechanism in the folded or inoperative position; Fig. 5 is a view partly in side elevation and partly in cross-section showing my preferred form of mechanism for operatively connecting the vertical lever to the movable member of the bellows; Fig. 6 is a similar view showing a modified form of the same mechanism; Fig. 7 is a view similar to that shown in Fig. 3, illustrating a modified form of my invention as applied to a vertical swinging bellows member, the parts being shown in unfolded or operative position; and Fig. 8 is a similar view of the parts shown in Fig. 7, illustrating them in folded or inoperative position.

In the drawings I have shown the treadles mounted on a hinged supporting base or frame.

5 and 6 indicate two brackets rigidly supported near the base of the instrument to which are pivoted the inner ends of the curved side arms 7 and 8, the forward end being rigidly connected by cross-piece 9. The side arms 7 and 8 and cross-piece 9 form a supporting base for the treadles 11 and 12 pivoted at 10. These treadles are preferably covered with rubber carpeting and the base is provided with cushioned feet consisting of projections 13 on the base of cross-piece 9 over each of which is fitted a cushioning cap 14 for the purpose of preventing injury to floors.

In the preferred form of pedal mechanism illustrated in Figs. 1 to 4, inclusive, where the movable member 20 of the bellows is arranged to swing in a horizontal plane, I prefer to provide a spring 20^a suitably secured in the instrument and adapted to collapse the bellows by forcing the movable member inward. In the alternative construction shown in Figs. 7 and 8, where the movable member 20^c of the bellows swings in a vertical plane, I provide a similar spring 20^b suitably secured in the instrument and adapted to collapse the bellows by forcing the movable member outward. On the swinging end of each movable member 20 I provide an abutment, projection or bracket 19 rigidly secured thereto, and intermediate of the projections 19 and the treadles 11 and 12 I fasten, to a support upon the instrument, brackets or supports to which are pivoted at the points 17 a pair of vertical levers 16, shaped so that they gradually curve at the lower end from the vertical to the horizontal, as shown in Figs. 3 and 4. The top of each of these levers is placed back of projections 19 so that the tension of spring 20^a and the weight of the treadles normally hold the projections and levers in contact. In the modified form illustrated in Figs. 7 and 8, the movable member 20^c of the bellows acts as a lever, swinging from its upper end and carrying the rigid extension 16^b, which is gradually curved from the vertical to the horizontal.

as shown in Figs. 7 and 8, and forms an extension of the lever. In both the constructions shown, I prefer to attach near the end of each treadle opposite to the end at which it is pivoted, one end of links 15, the opposite ends of these links being attached to the lower end of each of the levers 16 or 16^b. The length of these links is such that the treadles are normally held when in operative position at an angle of about fifty degrees. By lifting the treadle base to turn on 5 and 6 the treadles and base may be folded and disposed in inoperative position. It will be seen that when the base and treadles are unfolded they are projected in front of the instrument in operative position, and that when folded they may, if desired, be protected and concealed by the lower front board. In the constructions which I have shown the position of the pivotal points *x*, where the levers 16 or 16^b and links 15 are connected, are so related to the points 6, where the rear ends of the side arms are pivoted, that the distance between them remains constant in folding and unfolding, the point *x* being below or somewhat forward of the point 6, so that folding the treadles upon the pivotal points 6 flattens out or increases the angle formed by the links and treadles, while unfolding automatically decreases this angle to the initial position, thereby allowing the parts to be alternately folded and unfolded without predisposition.

In the form illustrated in Figs. 1, 2, 3 and 4, I prefer to operatively connect the projections or brackets 19 on the bellows and the top of the levers 16 by the means shown in Figs. 1 to 5. The lever 16 is provided at its upper end with an antifriction roller 17^b and the bracket 19 is provided with a U-shaped end in which is mounted an antifriction roller 19^b. In this construction the springs 20^a and the weight of the treadles 11 and 12 will hold the rollers 17^a and 19^b together constantly in operative contact.

In Fig. 6 I have shown a modified form of mechanism for operatively connecting the levers and brackets on the bellows. 16^a denotes a lever similar in construction to the lever 16, except that a conical opening is provided through its upper end and through the outer end of the bracket 19 and the curved bearing 22 with spherical end surfaces adjacent to the bracket and lever, and having the trunnions 23 extending out through the openings to the back of the lever and in front of the bracket, as shown in Fig. 6. These trunnions may be provided with threads and nuts to prevent the bearing 22 from being jarred out of position in shipment. It will, however, be understood that the weight of the treadle and the tension of springs 20^a tend at all times to hold the lever and bracket against bearing piece 22, so that

it is not necessary to secure the parts by these threads and nuts to make the mechanism operative.

I am aware that many modifications of my invention can be made by those skilled in the art, and I do not wish to be understood as limiting myself to the specific constructions herein shown, but

What I claim is:

1. In pedal mechanism, side arms pivoted at their inner ends to stationary supports, treadles pivoted at their forward ends to the outer ends of said arms, swinging bellows levers, links pivoted to the ends of said levers and the rear ends of said treadles, the pivotal points of said links and levers being substantially below and forward of the pivotal points of the inner ends of said side arms, the lever bearing normally against a stop, and the parts being so proportioned that during the folding movement the lever is pressed against its stop, whereby the distance between said pivotal points remains constant during folding or unfolding of said treadles, substantially as described.

2. In pedal mechanism, side arms pivoted at their rear ends to stationary supports, treadles pivoted at their forward ends to the forward ends of said arms, vertical bellows levers having their lower ends curved and extended below and forward of the pivotal points at the rear of said side arms and links pivoted to the lower or forward ends of said levers and the rear ends of said treadles, substantially as described.

3. In pedal mechanism, side arms pivoted at their inner ends to stationary supports, treadles pivoted at their forward ends to the outer ends of said arms, bellows levers, links pivoted to the ends of said levers and the rear ends of said treadles, the lever bearing normally against a stop, and the parts being so proportioned that during the folding movement the lever is pressed against its stop, whereby the distance between the pivotal points of said links and levers and the pivotal points of the inner ends of said side arms remains constant during folding and unfolding, and said parts may be folded or unfolded without preliminary arrangement, substantially as described.

4. In pedal mechanism, a swinging bellows member, a lever pivoted to swing in a plane at a tangent to the cylinder in which the free end of said bellows member swings and adapted to operate said bellows member, tension means for opposing said operation, and a treadle adapted to rock said lever:

5. In combination with rigid supports, side arms pivoted at their inner ends thereto, a bar connecting their outer ends, treadles hinged at their lower ends to said bar, vertical levers fulcrumed intermediate of their ends and having their lower ends bent or

curved in the direction of said treadles and links pivoted to the upper ends of said treadles and the lower ends of said levers, substantially as described.

5 6. In pedal mechanism, in combination with a bellows member pivoted to swing horizontally and a lever fulcrumed to swing vertically, bearings provided with curved surfaces on said lever and bellows member and means for holding said bearings in contact, for the purposes described.

7. In pedal mechanism, a pair of levers fulcrumed intermediate of their ends, a treadle base hinged below said levers, two treadles 15 pivoted at one end to said base and a pair of links above said hinges pivoted to the other end of each of said treadles, and to the lower end of the adjacent lever, substantially as described.

20 8. In pedal mechanism, in combination with a hinged treadle, a base, a vertical lever fulcrumed intermediate of its ends, means for operating said treadle and lever simultaneously, a movable bellows member pivoted to swing in a horizontal plane, a bracket on said movable member, and means for holding the outer end of said bracket and the upper end of said lever in operative contact.

9. In combination with a vertical lever, 30 having its lower end curved and extending forwardly, a side arm pivoted to a rigid support at its rear end above and in the rear of the lower forward end of said lever, a treadle pivoted at its forward end to the forward end of said side arm and a link pivotally connected to the lower end of said lever and the rear end of said treadle, substantially as and for the purposes described.

10. In combination with a movable bellows member pivoted to swing in a horizontal plane, a vertical lever pivoted intermediate of its ends, means for swinging said lever on its pivot, a hinged treadle and a spring, said treadle and spring being adapted to hold 45 the upper end of said lever and said member in operative contact.

11. In combination with a bellows, having a swinging member, a roller on an end of said member, a lever fulcrumed intermediate of its ends having a roller at one end and treadle mechanism at the other, and means for holding said rollers in contact.

12. In pedal mechanism, the combination with a movable bellows member pivoted to swing in a horizontal plane, an abutment on the swinging end of said member, a vertically disposed lever fulcrumed intermediate of its ends and curved at the bottom, a spring adapted to press said abutment against said 60 lever, a link having one end secured to the lower end of said lever, a treadle having its upper end pivotally secured to the other end of said link, and a treadle-base having its inner end pivotally secured to the instrument,

the lower end of the treadle being pivoted to 65 the outer end of said treadle-base.

13. In combination with a supporting frame, side arms pivotally secured at their inner ends thereto, a horizontal bar connecting the outer ends of said arms, treadles 70 hinged at their lower ends to said bar, a lever 16 within the case and links hinged at one end to said lever and at the opposite ends to the upper ends of said treadles, whereby said parts may be unfolded alternately to 75 turn upon the fulcrum of said arms to operative or horizontal position and folded to perpendicular or inoperative position, without adjustment or prearrangement of any of said parts.

14. In pedal mechanism, side arms pivotally supported at their rear ends, treadles hinged to the forward ends of said arms, bellows, vertically disposed levers connected thereto and links pivoted to said treadles 85 and to said levers at points below the pivotal points of supports of said side arms, the distance between the points where said levers and links are pivotally connected and the points where the forward ends of said side 90 arms and treadles are pivotally connected being substantially less in operative or substantially horizontal position than when in inoperative or substantially vertical position.

15. In pedal mechanism, a vertical lever 95 fulcrumed intermediate of its ends and having a curved bearing surface secured to the upper end, means for moving said lever on its fulcrum, a movable bellows member pivoted to swing in a horizontal plane, a projection 100 on said member having a curved bearing surface thereon, and means for holding said bearing surfaces in contact, for the purposes described.

16. In pedal mechanism, a vertical lever 105 fulcrumed intermediate of its ends, means connected to the lower end thereof for operating said lever, the lower end of said lever being curved to provide a repository space for the disposition of said operating means, 110 bellows mechanism and means for operatively connecting said bellows mechanism and the upper end of said lever.

17. In pedal mechanism, the combination of a bellows having a hinged member provided with a projection 19, a roller 19^b on said projection, a lever fulcrumed intermediate of its ends provided with a roller 17^b and adapted to swing said roller in a cylinder at a tangent to the cylinder in which the 120 roller 19^b swings, means for holding said rollers in contact and means for operating said lever, for the purposes described.

18. In pedal mechanism, side arms pivotally supported at their rear ends, treadles 125 hinged to the forward ends of said arms, bellows, vertically disposed levers connected thereto and links pivoted to said treadles

- and to said levers at points forward of the pivotal points of support of said side arms, the distance between the points where said levers and links are pivotally connected and
- 5 the points where the forward ends of said side arms and treadles are pivotally connected being substantially less when in operative or unfolded position than when in inoperative or folded position.
- 10 19. The combination of swinging levers, bellows members adapted to swing upon a vertical axis, bearing surfaces on said levers
- and bellows members, pedals adapted to rock said levers, and tension means adapted to hold said surfaces in operative contact 15 and resist the rocking of said levers by said pedals.

In testimony whereof I hereunto affix my signature in presence of two witnesses.

PAUL BROWN KLUGH.

Witnesses:

J. CLARKE HAGEY,
H. DAVENPORT.