

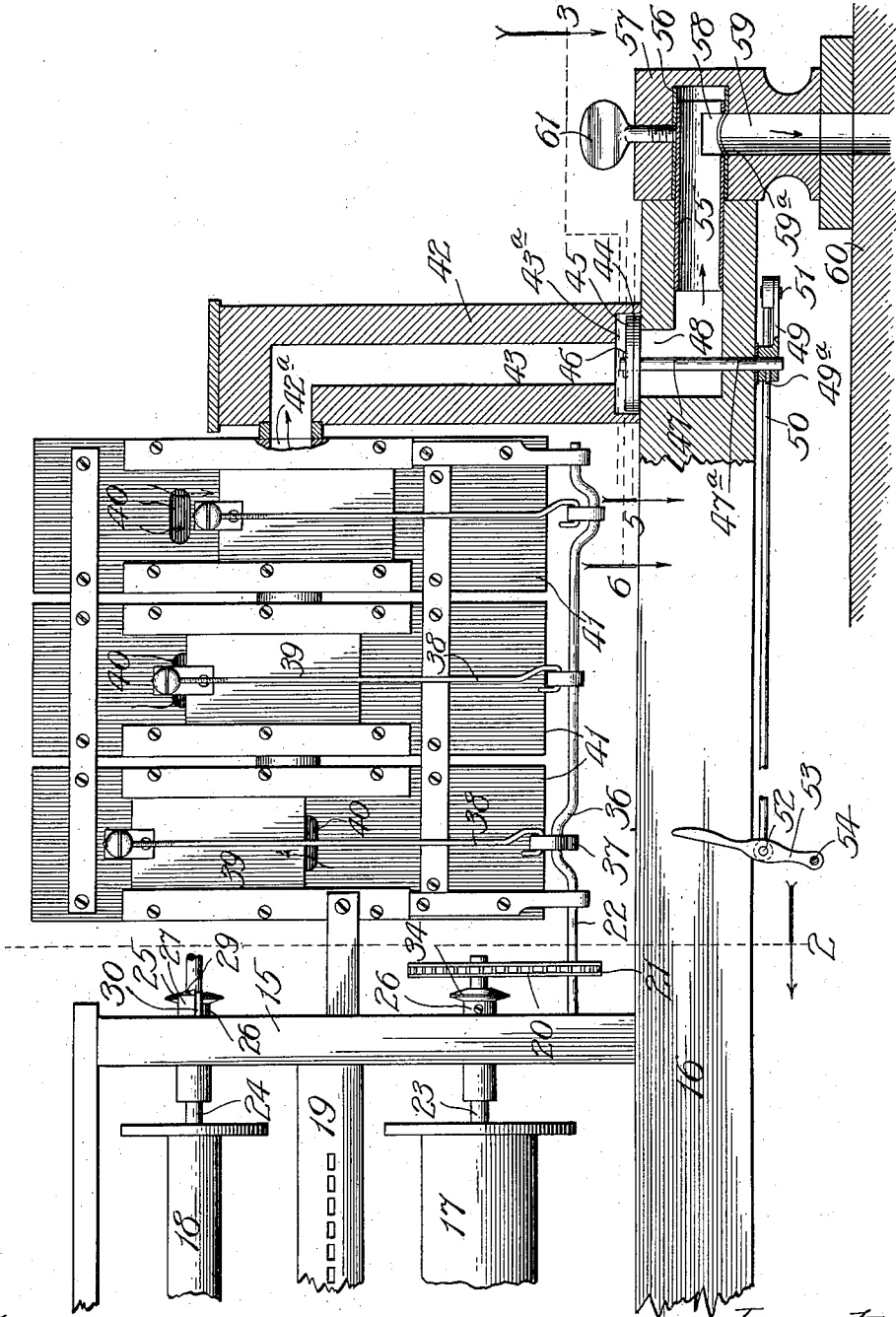
C. FREBORG.
PNEUMATIC PIANO PLAYER.
APPLICATION FILED SEPT. 21, 1909.

1,025,135.

Patented May 7, 1912.

2 SHEETS-SHEET 1.

Fig. 1.



Witnesses:

Chas. H. Buell
Clyde C. Palmer.

Inventor:

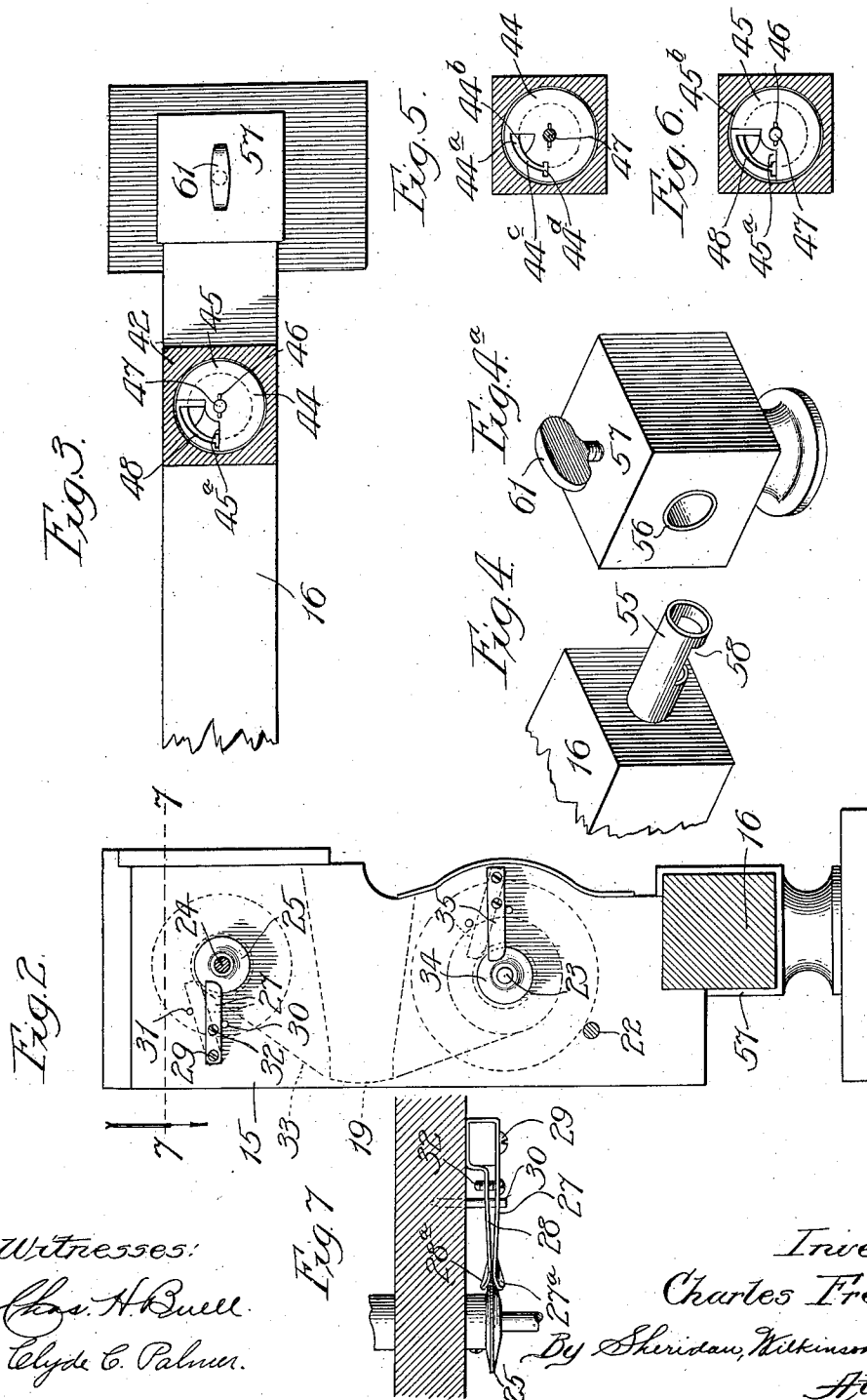
Charles Freborg.
By Sheridan Wilkinson & Scott.
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Inventor:

Charles Freborg.

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UNITED STATES PATENT OFFICE.

CHARLES FREBORG, OF KANKAKEE, ILLINOIS, ASSIGNOR TO SCHAEFFER PIANO MFG. COMPANY, A CORPORATION OF ILLINOIS.

PNEUMATIC PIANO-PLAYER.

1,025,135.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed September 21, 1909. Serial No. 518,730.

To all whom it may concern:

Be it known that I, CHARLES FREBORG, a citizen of the United States, residing at Kankakee, in the county of Kankakee and State of Illinois, have invented certain new and useful Improvements in Pneumatic Piano-Players, of which the following is a specification.

The object of my invention is to provide improved means for controlling the speed of automatic musical instruments, and it has particular reference to pianos in which rollers carrying a music sheet are driven by a motor actuated by air pressure.

My improvements are directed to the air valve which controls the flow of exhaust air from the motor, in those instruments which are driven by atmospheric air pressure, when the air is exhausted from the interior of the motor.

My improvements are also directed toward the supporting means for the music roller box, for the motor which drives the music rollers, the valve which controls the speed of the motor, and other parts of the instrument. I have endeavored to mount the said parts upon a rotatable support which permits them to be swung to such positions as will permit more convenient access to parts of the instrument which are commonly more or less out of reach. It has been my endeavor to so mount and construct the parts that they can be moved out of the way without disconnecting them from the instrument or interfering with their operative connection with it.

Another feature of my improvements comprises a tension producing brake or drag for the music rollers, whereby the sheet of music is unwound from said rollers under uniform tension and brought into contact with the tracker board with a uniform pressure.

Other objects and advantages will become apparent in the following specification and claims, taken in connection with the accompanying drawings, in which—

Figure 1 is a front elevation with parts in section, showing a portion of the music roller box, the motor, the supporting bar therefor, and other features of my improvements. Fig. 2 is a sectional view on the line 2 of Fig. 1, showing chiefly the music roller box in side elevation some parts being omitted. Fig. 3 is a plan view on line 3 of Fig.

1, showing the valve and its relation to the rotatively mounted supporting bar. Fig. 4 is a perspective view of one end of the supporting bar. Fig. 4^a is a perspective view of one of the journal bearings for the supporting bar. Fig. 5 is a horizontal section on the line 5, of Fig. 1, showing the valve seat. Fig. 6 is a horizontal section on the line 6, of Fig. 1, showing the valve. Fig. 7 is a horizontal section on the line 7, of Fig. 2, showing a plan view of the tension producing brake or drag.

In the drawings, the side walls 15 of the music roller box are fixed upon and supported by the bar 16. This bar 16 is preferably a square bar of wood and is pivotally supported upon the framework of the piano. The pneumatic motor, of which the pneumatics 41 form the principal part, are also fixed upon and supported by the bar 16. The music rollers 17 and 18 and the tracker board 19 are placed in the music roller box 15 in the usual manner. The music roller 17 is fixed upon the shaft 23, which is supported by bearings in the walls of the box 15. The music roller 17 is driven by gearing, which is sufficiently represented in the present case by the gears 20 and 21. The gear 20 is fixed upon the shaft 23, and the gear 21 which drives it is fixed upon the shaft 22. The roller 18 is carried by the shaft 24, which also is supported by bearings in the walls of the box 15. A flanged collar 25 is fixed to the shaft 24 by the screw 26 and is located on said shaft exterior to the wall of the music roller box. While the music is being played, the sheet of music is being unwound from the roller 18 and wound on to the roller 17. In order to produce a tension in the music sheet and cause it to lie snugly against the tracker board 19, a brake or drag is placed upon the shaft 24 of which the flanged collar 25 forms the principal part. The spring-like fingers 27 and 28 are adapted to press upon opposite sides of the flange of the collar 25, and by their friction with said collar to cause a resistance to its rotation. The ends 27^a and 28^a are flared sufficiently to permit the said fingers to easily become engaged with the flange of the collar 25. It will be noticed that the said flange has a shape which is more or less wedge-like and adapted to enter the space between the ends of said fingers. The tension of the fingers 27 and 28 is adjusted by

the screw 32, which is threaded into one of the fingers 28 and has its head bearing upon the other finger 27. By adjusting the screw 32, the desired pressure of the fingers upon the flange of the collar can be produced, and the desired frictional resistance can be easily brought about. The fingers 27 and 28 are pivotally mounted upon the framework by means of the screw 29. The pin 30 acts as a stop to limit the movement of the fingers in one direction. This pin 30 prevents the fingers being swung too far and becoming disengaged from the flange of the collar 25. The pin 31 limits the movement of the fingers in the opposite direction. It will be seen that a rotation of the flanged collar 25 in one direction causes the fingers to be drawn into engagement with said flange, while the movement in the opposite direction causes them to be disengaged with said flange.

The sheet of music 33 moves downwardly from the roller 18 to the roller 17 while the music is being played. The roller 17 is driven by the motor and therefore a tension is produced in the sheet 33. The fingers 27 and 28 act as a brake or drag on the roller 18 and prevent it from whirling around and allowing the slack in the sheet 33 to occur. Upon the shaft 23 is placed a similar drag, which is so placed as to resist movement of the roller 17 in the direction opposite that of the roller 18. This prevents a whirling action in the roller 17 when the sheet is being unwound from said roller. This drag comprises the flanged collar 34, spring fingers 35, &c., similar to the drag applied to the roller 18.

The motor which drives the above described music rollers is in all respects the same as that commonly employed in pianos of this character and comprises the main shaft 36, connecting rods 37, valve stems 38, slide valves 39, pneumatics 41, air inlet ports 40, &c. The vertically disposed air pipe 42 is fixed to and mounted upon the bar 16 at its lower end and is attached to the motor at its upper end at the exhaust opening 42^a of said motor. The duct 43 in the pipe 42 leads to the chamber 43^a above the valve 45. This valve 45 is fixed to the shaft 47 by the pin 46. The valve 45 is circular in form and rests upon the circular seat 44. The valve 45 is provided with an angular opening 45^a which leads to a port 44^a in the seat 44. The seat 44 is provided with a port 44^a which has a larger portion 44^b and a smaller elongated portion 44^c which terminates in a right angularly disposed portion 44^d. The larger portion 44^b first becomes covered by the edge 45^b of the valve 45 when restricting the flow of air. The elongated portion 44^c is next covered and gives a much more restricted and graduated effect.

The valve stem or shaft 47 has a bearing

47^a in the bar 16. The arm 49 is fixed to said shaft by the set screw 49^a and is pivotally attached to the connecting rod 50 by the pin 51. The connecting rod 50 is at its opposite end pivotally attached to the lever 53 by the pin 52, and said lever is pivotally attached to the frame by the pin 54.

The supporting bar 16, upon which all the above described parts are mounted, is rotatively supported by the bearings 57, which are supported by and fixed to the main frame 60 of the instrument. The rotative mounting of the bar 16 is such as to permit a flow of air through the duct 48 and through another duct 59 in the bearing 57, in the various rotated positions of said bar 16. This is accomplished by inserting a hollow metal sleeve 55 in the duct 48 at the end of the bar 16. This hollow sleeve 55 is allowed to project beyond the end of the bar 16 and serve as a journal. Another sleeve 56 serving as a bushing is carried by the body of the bearing 57, and thus serves as a journal bearing for the sleeve 55. The thumb screw 61 is threaded through the body 57 of the bearing and also through the sleeve 56 and bears at its end upon the sleeve 55. This provides a means for holding the bar 16 in any desired angular position. This sleeve 55 is tightly driven into the end of the bar 16 or may be otherwise fixed thereto.

In order to provide a free channel for the air from the duct 48 to the duct 59, an elongated aperture 58 is provided in the sleeve 55, and is so proportioned as to remain in communication with the circular aperture 59^a in the bushing 56, in the different angular positions of the bar 16. This aperture 59^a opens into the duct 59.

The operation of my improvements will doubtless be clear from the above description. The person using the instrument controls the time of the music by moving the lever 53 to the right or left and thereby causing the valve 43 to take positions in which the port 44^a is more or less closed by the edge 45^b in the valve 45. The chamber 43^a is thus placed more or less fully in communication with the opening 48 and the flow of air is thus restricted to any desired extent. The flow of air when thus restricted causes the motor to operate more slowly.

When it is desired to reach any part of the instrument which lies behind the motor or music roller box for adjustments or repairs, the said motor and music roller box may be swung forward out of the way. This may be done by first loosening the set screws 61 in the bearings 57. The journals 55 are then free to rotate in the bearings.

The operation of the drags on the shafts of the rollers has already been referred to. By turning the screw 32, any desired tension in the spring fingers 27 and 28 may be pro-

duced and any degree of frictional resistance to rotation of the collar 25 which slides between them may be produced. The friction between the fingers and the flange automatically draws the fingers into engagement with the flange and the pin 30 holds them in the proper relative position to the flange for the best effect. A reversed rotation pushes the fingers out of engagement with the flange. The pin 31 prevents their becoming pushed out of range of the flange.

While I have described more or less precisely the details of construction, I do not wish to be understood as limiting myself thereto, as I contemplate changes in form and the proportion of parts and the substitution of equivalents as circumstances may suggest or render expedient without departing from the spirit of my invention.

I claim:

1. In a musical instrument, the combination with a motor and a music roller box, of a rotatively mounted supporting bar for said motor and said box, bearings for said bar, an air duct in said bar leading from said motor, and a valve in said bar adapted to control said duct.

2. In a musical instrument, a motor, a music roller box, a rotatively mounted supporting bar for said motor and said box, bearings for said bar, an air duct in said bar leading from said motor, a valve in said bar for controlling said duct and an air duct in one of said bearings communicating with said air duct in said bar.

3. In a musical instrument, a motor, a music roller box, a rotatively mounted supporting bar for said motor and said box, bearings for said bar, an air duct in said bar leading from said motor, a valve in said bar for controlling said duct, an air duct in one of said bearings, and means for maintaining communication between said air ducts in the different rotated positions of said bar.

4. In a musical instrument, a motor, a music roller box, a rotatively mounted supporting member for said motor and said box, an air duct in said member, and a hand operated rotary valve carried by said bar for controlling the flow of air through said duct.

5. In a musical instrument, a motor, a music roller box, a rotatively mounted supporting member for said motor and said box, bearings for said member, an air duct in said member leading from said motor, an air duct in one of said bearings open to said duct in said member and a hand operated rotary valve carried by said bar controlling the flow of air through said ducts.

6. In a musical instrument, a motor, a music roller box, a rotatively mounted supporting member for said motor and said box, an air pipe leading from said motor to said member, an air duct in said member leading from said pipe, and a valve in said member controlling said duct.

7. In a musical instrument, a motor, a music roller box, rotatively mounted supporting means for said motor and said box, an air duct in said supporting means, a valve carried by said supporting means, and hand operated means for controlling said valve.

8. In a musical instrument, a motor, a music roller box, a rotatively mounted supporting member for said motor and said box having a journal, a bearing for said journal, means engaging said journal for holding said member in its different rotated positions, an air duct in said journal leading from said motor, and a valve carried by said member adapted to control said air duct.

In testimony whereof, I have subscribed my name.

CHARLES FREBORG.

Witnesses:

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HENRY A. PARKS.