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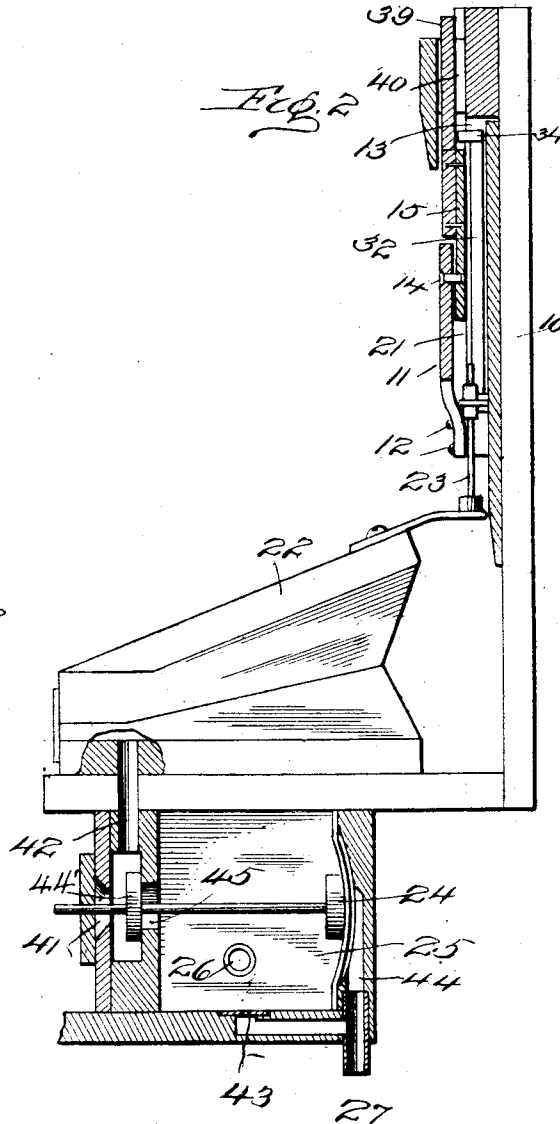
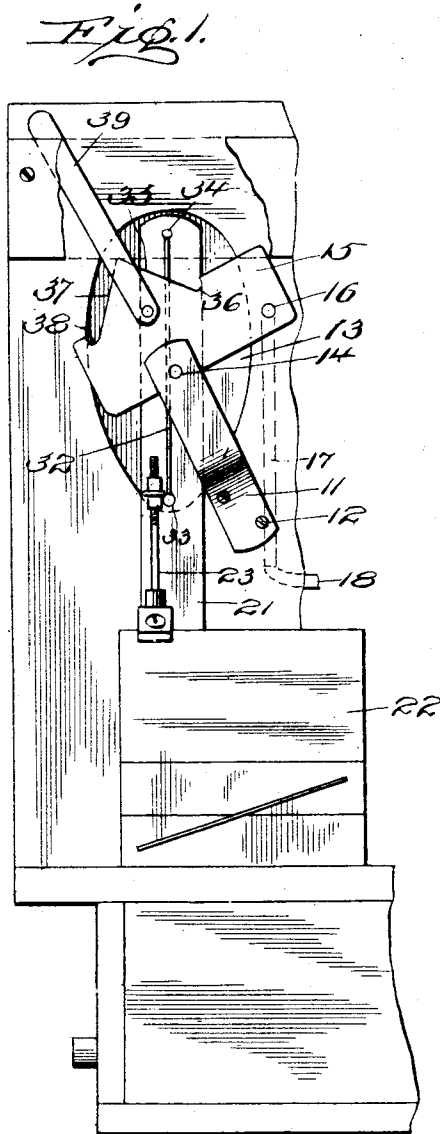
PATENTED OCT. 15, 1907.

E. D. ACKERMAN, C. E. CLINTON & R. N. ELTOM.

AUTOMATIC VALVE MECHANISM.

APPLICATION FILED FEB. 9, 1906.

2 SHEETS—SHEET 1.



Witnesses
W. H. Fowler
R. L. Merrill

Inventors
Edwin D. Ackerman
Charles E. Clinton and
Robert N. Eltom.
By *Mass. Power & Light Co.* Attorneys

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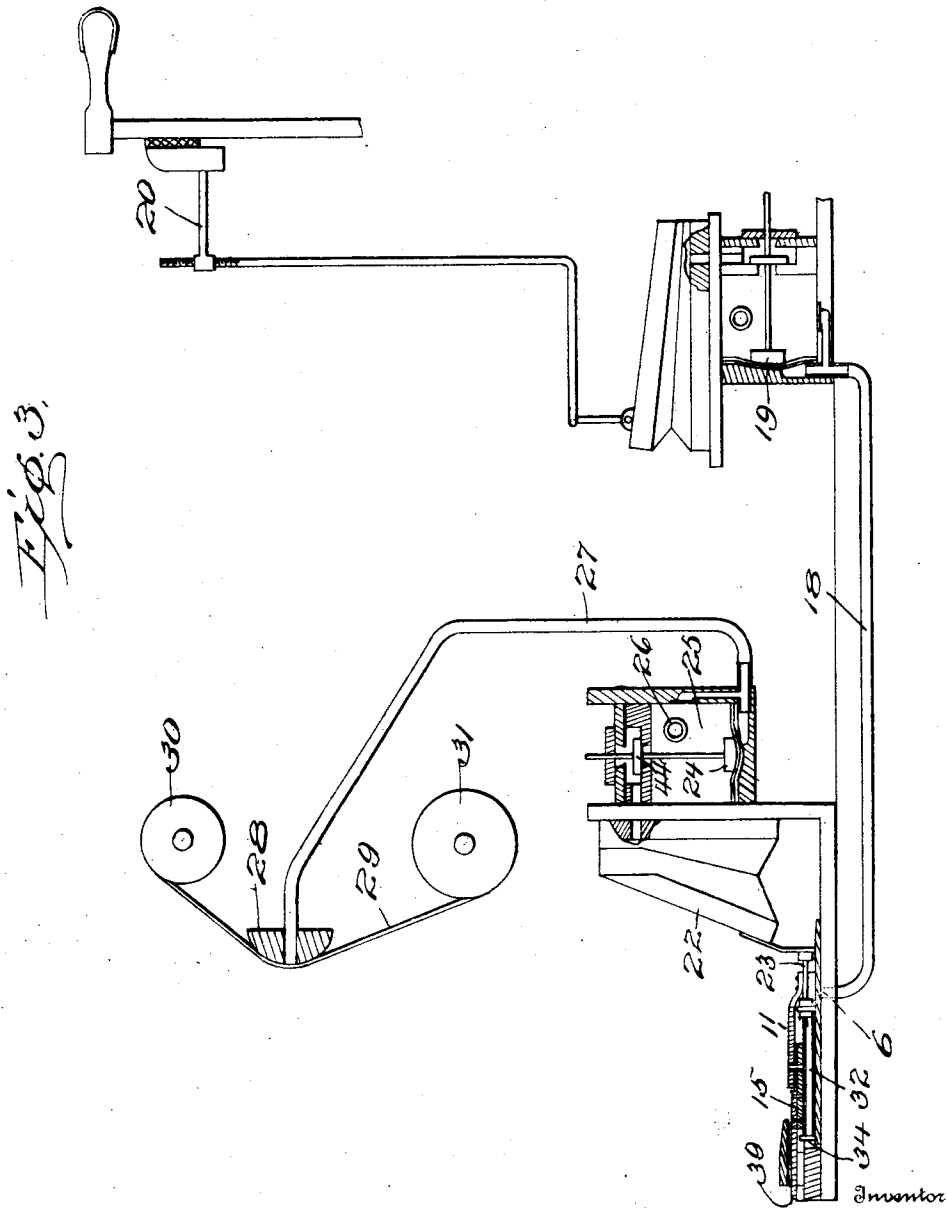
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Witnesses

Wm. Fowler Jr.
L. Merrill

By

Edwin D Ackerman
Charles E Clinton and
Robert N. Eltom
Masafumie Hawmoe
Attorneys

UNITED STATES PATENT OFFICE.

EDWIN D. ACKERMAN, OF NEW YORK, AND CHARLES E. CLINTON, AND ROBERT N. ELTOM, OF CORONA, NEW YORK, ASSIGNORS, BY DIRECT AND MESNE ASSIGNMENTS, TO THE PIANORA COMPANY, A CORPORATION OF NEW YORK.

AUTOMATIC VALVE MECHANISM.

No. 868,386

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed February 9, 1906. Serial No. 300,341.

To all whom it may concern:

Be it known that we, EDWIN D. ACKERMAN, CHARLES E. CLINTON, and ROBERT N. ELTOM, citizens of the United States, residing at New York and Corona, respectively, in the counties of New York and Queens, respectively, and State of New York, have invented certain new and useful Improvements in Automatic Valve Mechanism; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to valve operating means for use in connection with self-playing musical instruments, and has for an object to provide a device of the class embodying new and improved features of reliability, quickness of action, convenience and efficiency.

A further object of the invention is to provide means for operating a valve which, in turn, may operate the expression device of the piano, a re-winding mechanism or other similar parts, and embodying improved construction, actuated through the instrumentality of air admitted through perforations in the perforate music sheet passing over the tracker bar in the usual manner.

Specifically it is the object of the invention to provide means for governing the expression of the piano and brought into action by means of perforations properly spaced along one edge of the music sheet, a number of devices being employed to produce forte and pianissimo effects.

In governing the re-winding of the music sheet, the valve operating mechanism is actuated by air admitted through a perforation at the extreme ends of the sheet so that when the final end of the sheet reaches, the tracker bar air is admitted to automatically actuate the valve to throw in operation the re-winding mechanism and to re-wind the sheet into position and condition for repeated use, and when so re-wound, a second perforation is brought to register with the opening in the tracker bar to restore the valve operating device to normal position.

With these and other objects in view the invention comprises certain novel constructions, combinations and arrangements of parts, as will be hereinafter fully described and claimed.

In the accompanying drawings:—Figure 1 is a view of the valve operating device in side elevation. Fig. 2 is a view of the valve operating mechanism with the reciprocating bar and associated parts in vertical section and the pneumatic in end elevation. Fig. 3 is a diagrammatic view of the improved valve operating mechanism in operative position.

Like characters of reference designate corresponding parts throughout the several views.

In its preferred embodiment, the improved valve operating mechanism forming the subject-matter of this application, may be secured to any convenient portion of the instrument as the bar 10, by means of the bracket 11 rigidly connected as by the screws 12 and extending in an inclined position over the recess 13. To the upper end of the bracket 11, as at 14, is pivoted the port closure 15 arranged to cover the port 16, which communicates by means of a passage 17 and pipe 18 with the pneumatic 19 or a like valve for operating the several parts, as the expression controlling means 20.

For operating the port closure 15 to cover and uncover the port 16, a bar 21 is mounted within the recess 13 to reciprocate vertically being actuated by means of a pneumatic 22 to which it is connected by means of an adjusting bolt 23. The pneumatic 22 is controlled by means of a pneumatic 24 mounted within an exhaust chamber 25, which communicates by means of opening 26 with the main wind chest or exhaust chamber of the instrument. By means of the pipe 27 communication is established between the pneumatic 24 and the tracker bar 28 over which is slidably moved, in the usual manner, the perforated music sheet 29 wound upon the rollers 30 and 31.

The bar 21 is provided upon its surface with a resilient arm 32, rigidly secured thereto, as at 33, at its lower end, and carrying at its upper and free end a lug 34 positioned to engage the inclined edge 35 and the notch 36 of the port closure 15, when the closure is in the position shown in Fig. 1, and the inclined edge 37 and notch 38, when the closure has been rotated about its pivot 14, to open the port 16. For manually operating the closure 15, a lever 39 is rigidly secured thereto with its extremity protruding through a slot 40 in any convenient portion of the instrument case, as directly in front of the keyboard within easy reach of the operator.

When the device is used for actuating the rewind mechanism, the pneumatic 22 is normally held in an open position and the bar 21 in an elevated position by means of an internal spring, air being admitted thereto through the opening 41 and passage 42. The exhaust chamber 25, by reason of its communication through the pipe 26 with the main exhaust chamber, is maintained continually in an exhausted condition and the exhaustion upon both sides of the valve 24 maintained equal by means of a bleeder 43 communicating with the passage 44 which forms a part of the pipe 27. When a perforation of the music sheet 29 passes over the opening in the tracker bar 28, communicating with

the pipe 27 air is admitted therethrough to the passage 44 in the rear of the pneumatic 24 and operating in opposition to the exhaust upon the opposite side raises the valve 44' to open the port 45 and close the port 41 5 whereby the passage 42 is thrown into communication with the exhaust chamber 25 and the air contained in the pneumatic 22 exhausted therefrom. When the air is exhausted from the pneumatic 22 the external atmospheric pressure closes the said pneumatic against 10 the tension of the contained spring and carries downward with it the bar 21 and flexible arm 32 rigidly secured thereto. The lug 34 of the flexible arm 32 engaging the inclined surface 35 moves slidably into engagement with the notch 36 and by a continued downward movement rotatably moves the port closure 15 about its pivot 14 to uncover the port 16. When the perforations in the music sheet have passed the opening in the tracker bar the exhaust chamber 44 is again neutralized by means of passage of the air in the pipe 27 20 through the bleeder 43 and by reason of the atmospheric pressure at the port 41, the valve 44' is again closed, closing the port 45 and admitting air through the port 41 and passage 42 into the pneumatic to permit the pneumatic to open under the tension of its spring 25 to raise the bar 21 to the position shown in Figs. 1 and 2.

The opening of the port 16 admits air to the pipe 18 to operate the valve 19 and its associated pneumatic in the manner described for the operation of the valve 44' and the expression, pianissimo or other mechanism are 30 thereby in operation until either perforation in the music sheet 29 passes the opening in the tracker communicating with the pipe 27 upon which happening, the bar 21 is again and similarly actuated, but this time the lug 34 engages the inclined edge 37 and slides into 35 the notch 38 and the continued movement moves the port closure upon its pivot back to normal or closing position as shown in Figs. 1 and 2, whereupon the pneumatic 22 is again relieved, as above described.

What I claim is:—

- 40 1. In a mechanical player for musical instruments, a valve controlling device provided with a port and comprising a duct terminating at the port, a reciprocating bar, a resilient arm carried by the bar and provided with a lug, a pivoted closure for the port provided with means 45 for engagement with and to be alternately opened and closed by the lug, and means for reciprocating the bar.

2. In a mechanical player for musical instruments, a valve controlling device provided with a port and comprising a duct terminating at the port, a reciprocating bar, a resilient arm carried by the bar and provided with a 50 lug, a pneumatic adapted to reciprocate the bar, means to exhaust air from the pneumatic, and a closure for the port embodying means for engagement with and to be alternately opened and closed by the lug.

3. In a mechanical player for musical instruments, a 55 valve controlling device provided with a port and comprising a duct terminating at the port, a reciprocating bar, a resilient arm carried by the bar and provided with a lug, a pneumatic arranged to reciprocate the bar, a tracker bar provided with an opening in communication 60 with the pneumatic, means to move a perforated music sheet across the tracker bar to a position for the perforations to register with the opening, and a pivoted closure for the port embodying means for engagement with and to be alternately opened and closed by the lug. 65

4. In a mechanical player for musical instruments, a valve-controlling device provided with a port and comprising a duct terminating at the port, a closure for the port comprising a plate pivoted intermediate its ends and 70 positioned with one end normally closing the port and having reversely inclined cam faces, a bar mounted to reciprocate, a resilient member carried by the bar, and means carried by the resilient member for alternately engaging opposite inclined cam faces at alternate reciprocations. 75

5. In a mechanical player for musical instruments, a valve-controlling device provided with a port and comprising a duct terminating at the port, a plate pivoted intermediate its ends and with one end positioned to normally 80 close the port, reversely inclined guides formed upon opposite sides of the plate and terminating substantially in a point, a resilient member mounted to reciprocate, means carried by the resilient member for alternately engaging opposite inclined guides at alternate reciprocations, and means to actuate the reciprocating member. 85

6. In a mechanical player for musical instruments, a valve-controlling device provided with a duct terminating in a port, a pivoted closure for the port, a resilient member mounted to reciprocate adjacent the closure, means 90 carried by the resilient member for engaging the closing member alternately upon opposite sides of the pivot, means to actuate the resilient member, and means carried by the closure to facilitate manual operation of the closure.

In testimony whereof we affix our signatures in presence of two witnesses.

EDWIN D. ACKERMAN.
CHARLES E. CLINTON.
ROBERT N. ELTOM.

Witnesses:

SAMUEL A. LECHTENSTEIN,
HUGO MOCK.