

F. J. W. WEISER.
RETARD DEVICE.
APPLICATION FILED MAR. 22, 1909.

976,965.

Patented Nov. 29, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

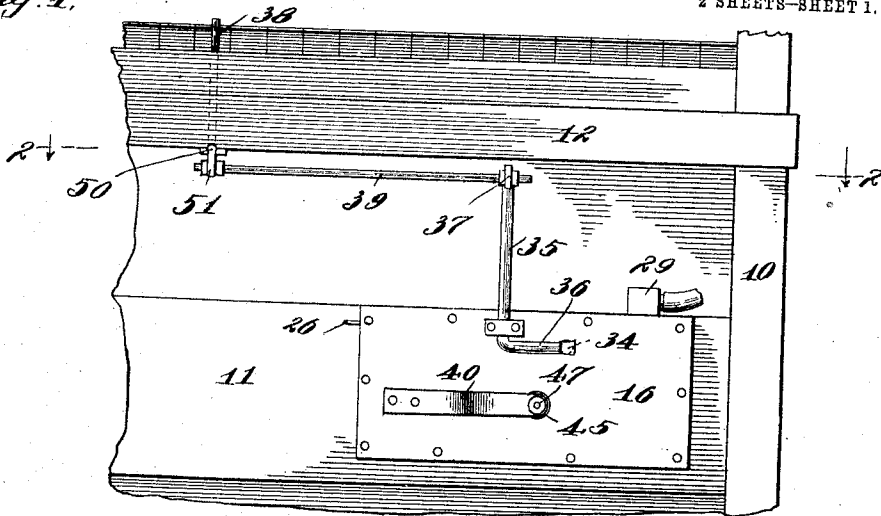


Fig. 2.

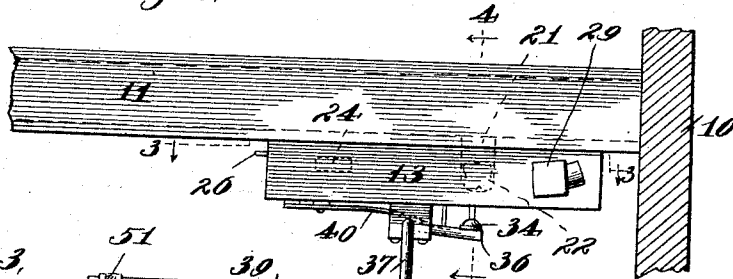
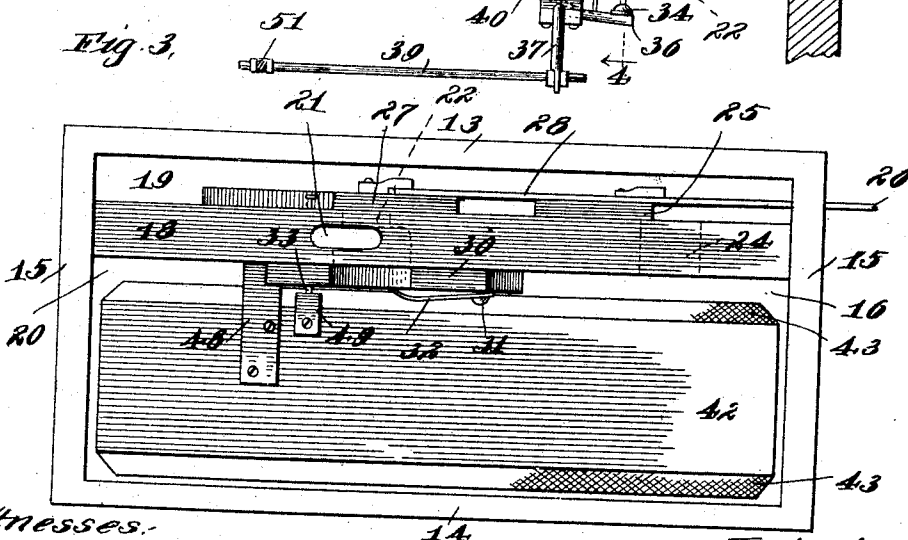


Fig. 3.



Witnesses.

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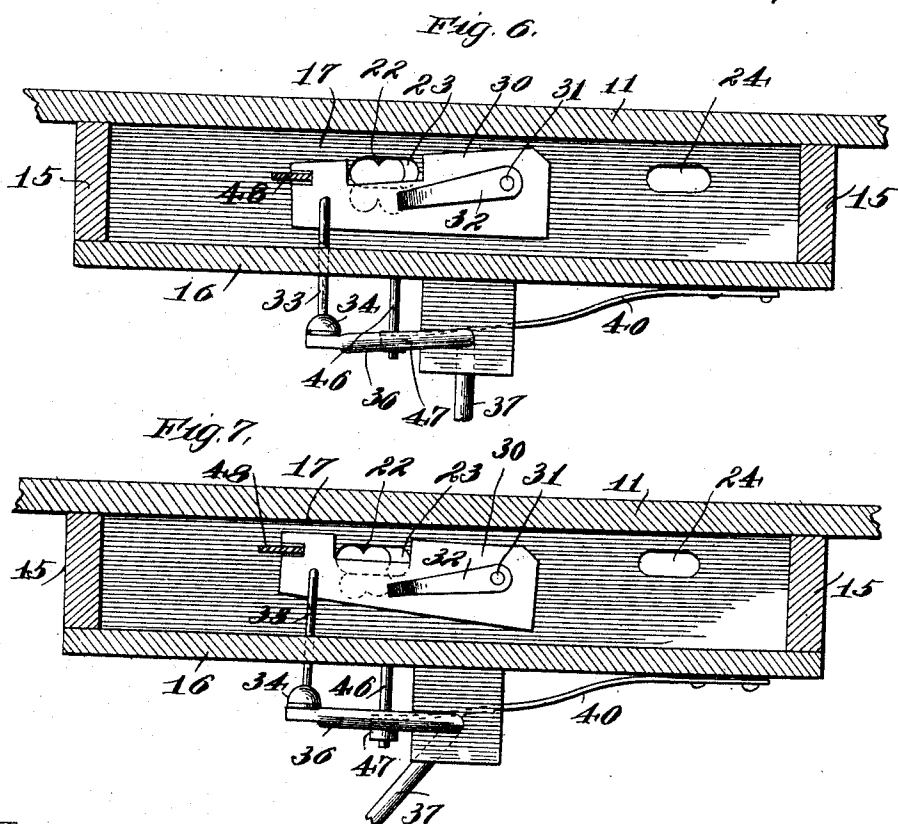
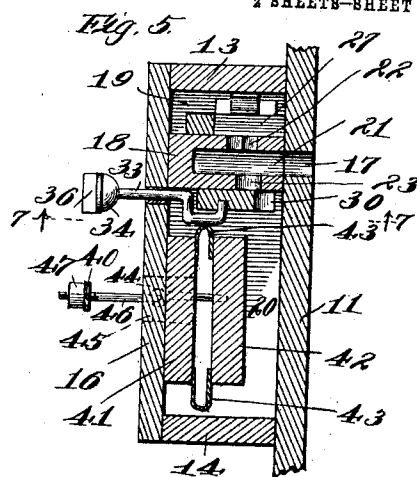
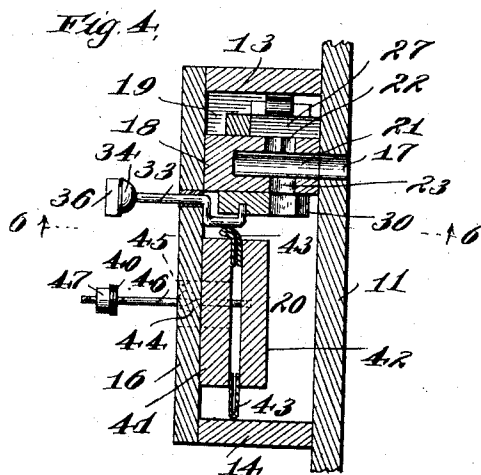
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By *Coburn & McRoberts*
his Attys

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2 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

FRANK J. W. WEISER, OF CHICAGO, ILLINOIS, ASSIGNOR TO GEORGE P. BENT COMPANY,
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RETARD DEVICE.

976,965.

Specification of Letters Patent.

Patented Nov. 29, 1910.

Application filed March 22, 1909. Serial No. 484,899.

To all whom it may concern:

Be it known that I, FRANK J. W. WEISER, 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 Retard Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to pneumatic music-playing instruments, and particularly to a new and useful retarder therefor to regulate the flow of air from the motor to the main wind-chest so that the operator may more or less hold or retard a note or notes.

The illustration herewith shows the retarder applied to an autopneumatic piano but of course it may be employed in pneumatic organs or other like music-playing instruments.

In the drawings Figure 1 is a front view showing the frame, wind-chest and retarder of a pneumatic piano embodying my invention; Fig. 2 is a top plan view of the parts of Fig. 1 with the retard-lever in section, the view being taken on the line 2—2 of Fig. 1; Fig. 3 is a rear view of the open side of the retarder or governor box taken on line 3—3 of Fig. 2 and showing the interior arrangement of parts; Fig. 4 is a sectional view on the line 4—4 of Fig. 2 with the parts in position when the governor valve is open; Fig. 5 is a similar view of the same parts in position when the valve is partly closed; Fig. 6 is a sectional view on the line 6—6 of Fig. 4, and Fig. 7 is a sectional view on the line 7—7 of Fig. 5.

In the drawings the numeral 10 indicates the frame, and 11 the wind-chest located below the key-bottom 12, all which with the bellows, music-sheet operating mechanism, pneumatic-motor and other usual parts necessary to provide operative playing means, may be of any desired or well-known construction.

The governor or retarder box comprises a top 13, bottom 14, ends 15, and front side 16, providing a box of suitable rectangular shape which is supported upon the wind-chest as shown in Figs. 1 and 2. The wall of the wind-chest forms the closure for the open side of the box and the wind-chest is provided with a passage 17, whereby communication is established between the interior of the wind-chest and the interior of

the box. The box is divided into upper and lower compartments by the longitudinal partition 18; the upper compartment 19 is relatively shallow to provide a wind-passage and the lower compartment is relatively deep to provide a bellows and valve chamber. The partition 18 is provided with a horizontal passage 21 which registers with the passage 17 from the wind-chest, and the passage 21 is provided with upper and lower extensions or ducts 22 and 23, leading respectively into the upper and lower compartments of the box. The partition 18 is also provided with a vertical passage 24 to establish communication between the upper and lower compartments, this passage being opened and closed by means of slide-valve 25, which gives the general tempo for any particular piece of music played. This valve is suitably controlled by any appropriate means coöperating with its stem 26, being set to the time indicated on the music-roll or note-sheet in the machine. The upper duct 22 is opened and closed by means of a re-roll valve 27 which likewise is moved to open and close the duct by any suitable means coöperating with its stem 28; it is of course understood that this re-roll valve is closed during the playing operation, and is opened for the purpose of rewinding or re-rolling the music sheet upon its roller after the playing operation is completed. The upper compartment is provided with a connecting tube 29, leading to the motor; when the re-roll valve 27 is closed and the tempo valve opened more or less, air is drawn from the motor into the compartment 19, thence through passage 24 into the chamber 20 and through ducts 23, 21 and 17 to the wind-chest to operate the music-winding spool on which the music-sheet is wound and other coöperating parts (not shown).

The winding operation of the music-spool is governed by the supply of air passing through the ducts 23 and 17, and if this supply be diminished the spool will be more slowly rotated, so by closing this passage more or less the operator may hold or retard a note or notes. For this purpose the chamber or compartment 20 is provided with a governor-valve 30 pivoted at 31 upon the under face of the partition 18 and adapted to control and regulate the passage of air through the duct 23. The valve is provided with a retaining-spring 32 attached to its

pivot and bearing on the valve to hold it against the partition. The valve is provided with a stem 33 extending through the front of the box and provided with a flat leather head 34. When it is desired to hold a note or notes the operator moves the stem to shift the valve from the position shown in Fig. 4 more or less to the position shown in Fig. 5, whereby the passage from the chamber 20 to the wind-chest is more or less closed, and the note or notes are held or retarded. Any suitable means may be employed for closing the valve, and in the construction shown, I provide a vertical rock-shaft 35 suitably mounted in bearings upon the box or chest and having a lower angular arm 36 adapted to bear against the head 34, and also having an upper offset angle arm 37 whereby the rock shaft may be oscillated to cause the arm 36 to move the valve 30. The upper end of the rock-shaft may be operated by any suitable means mounted in position above the key-bottom; in the drawings I show a retard lever 38 adapted to be shifted or moved toward the left by the operator to transmit its motion to the angular rock-shaft by means of suitable connecting links 39. When the operator desires to hold a note or notes, he moves this lever to the left and the angle arm 36 bears or presses against the head 34 of the stem of the governor valve which thereby restricts or closes the opening more or less, and holds the note; when the operator releases the retard lever a spring 40 retracts or opens the valve, and the motor resumes its original tempo.

The chamber is provided with a pneumatic regulator device which is connected to the valve 30 and transmits the force of the spring 40 to retract the valve. This device comprises a bellows having a fixed front-piece 41 secured on the inner face of the side 16, a movable back-piece 42 pivoted to the front-piece, and a flexible bellows-fold 43. The hinged member or back-piece 42 is provided with a screw-eye 44 which passes freely through an opening 45 in the front-piece 41 and the side 16, and which is detachably connected to a second screw-eye 46 passing out to the front of the box where it is provided with an adjustable washer 47 bearing against the spring 40 which preferably is in the form of a leaf spring attached at one end to the outer face of the side 16 and being bent outwardly at its free end so that it is put under tension as the back-piece 42 of the bellows is moved from the position indicated in Fig. 4. The movable back-piece 42 of the bellows is provided with a standard or post 48 projecting approximately to the under face of the partition 18, and the valve 30 is provided at its free end with a fork or yoke embracing the upper end of the post 48 whereby as the

valve is moved inwardly by its stem 33 the movable back-piece 42 of the bellows is moved with it against the tension of its spring 40. By this construction the valve is operated in one direction by the spring 40 through the intermediate back-piece 42 and its connections with the valve, and in the opposite direction by the stem 33 and its cooperating retard lever.

The valve 30 is preferably in the form of a pivoted blade or shutter oscillating over duct 23, and for economy of space it may be cut-away adjacent the duct 23. The inner end of the stem 33 rests on a block 49 on the bellows to prevent the stem from becoming displaced.

When the player is operating the wind is drawn from the motor by the pumping-bellows (not shown) through the compartment 19 and through the tempo-valve opening 24 to the lower chamber 20 and thence through the ports 23 and 17 to the wind-chest to operate the music-roll and the co-operating parts of the player; the passage of the air creates more or less exhaust or vacuum in the chamber 20, the more pressure exerted on the pumpers or pedals (not shown) the greater being the exhaust in 20, and the bellows, open to the atmosphere from its interior by port 45 tends to open or expand and to close the opening 23 by the governor-valve; this tendency or effect is resisted by the governor spring 40 which always tends to open the valve 30 to allow the air to pass freely through the port 23. When the operator desires to retard or hold a note or notes he presses on the retard lever or button 38 to cause the angular end 36 to move the valve to more or less close or restrict the opening or port 33, thereby decreasing the exhaust from the motor to the wind-chest and causing the music-roll to wind the music-sheet more slowly over the tracker-board (not shown). When the operator releases the lever or button, the spring 40 causes the valve to fully open the port 23 and the original tempo is restored. The advantage of the normally open connection between the retard-lever and the governor-valve, illustrated in the present embodiment by the arm 36 separate from or disconnected from the stem 33, is that when the operator does not hold or retard a note, the governor-valve is not working all the parts necessary to operate it for retarding notes and which would cause friction and unevenness in the working of the motor. That is to say, if the operating levers and parts were connected positively to the valve, they would be moved by the movement of the regulator-device which is more or less constant as the pumpers are worked faster or slower, and their movement would create friction and resistance to the motor and would cause it to work unevenly.

In the operation of retard devices as heretofore constructed the governor valve is positively connected to its operating key or other device in the key board and as these parts are necessarily quite widely separated the valve is moved by intermediate connections and levers, and consequently when the operator releases the key the spring employed to return the valve to its original position to restore the general tempo is obliged to overcome the friction of these intermediate connections and their mountings; as this friction varies under varying conditions of temperature, dampness, humidity etc., it consequently changes the tempo or affects its adjustment, this defect increasing as the spring loses more or less of its power by use and wear. By my construction there is no friction of intermediate connections and their mountings to be overcome by the spring 40 in returning the governor valve to restore the original tempo, the valve returns to its predetermined adjusted position with certainty and is not influenced by any such opposing forces, so that the adjustment of the tempo is not affected and the original tempo is restored without any variation or change. Any suitable means may be provided for thus operating the governor-valve; the part 38 may of course be in any desired form or arrangement such as a button, key, etc.; in the form shown it is a lever connected at its lower end to the front end of a bell-crank lever 50

mounted in a groove on the underside of the key-bottom and extending rearwardly being provided at its rear end with a depending crank-arm 51 connected to the link 39. When the lever is rocked or moved to the left, the arm 51 transmits motion to move the arm 36 against the head 34 to shift the valve 30.

Having described my invention, I claim:—

In a device of the class described, a box having a partition providing a compartment and a communicating chamber, a tempo valve on the partition controlling the communication from the compartment to the chamber, a wind-chest communicating with the chamber, a retard valve comprising a blade pivoted on the partition and controlling the latter communication, a pneumatic regulator device in the chamber comprising a bellows having a movable back-board, a spring for collapsing the bellows, connections between the retard valve and the back-board to open the valve, a retard lever and means intermediate the lever and valve and having an element normally disconnected from the latter to operate the valve against the tension of the spring by the lever.

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

FRANK J. W. WEISER.

Witnesses:

GEORGE R. HARBAUGH,
J. McROBERTS.