P. WELIN.

AUTOMATIC PLAYING ATTACHMENT FOR MUSICAL INSTRUMENTS.

APPLICATION FILED NOV. 20, 1903. RENEWED JUNE 15, 1909.

945,885. **Patented Jan. 11, 1910.**

3 SHEETS—SHEET 1.

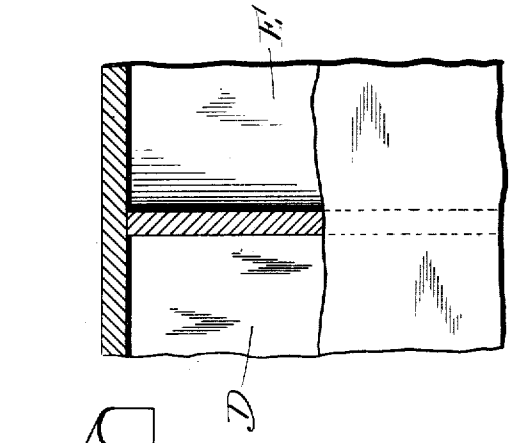

Fig. 2.

Fig. 1.

Witnesses:
E. F. Wesson
A. M. Goddard

Inventor:
P. Welin
By his Attorneys
Southgate & Southgate

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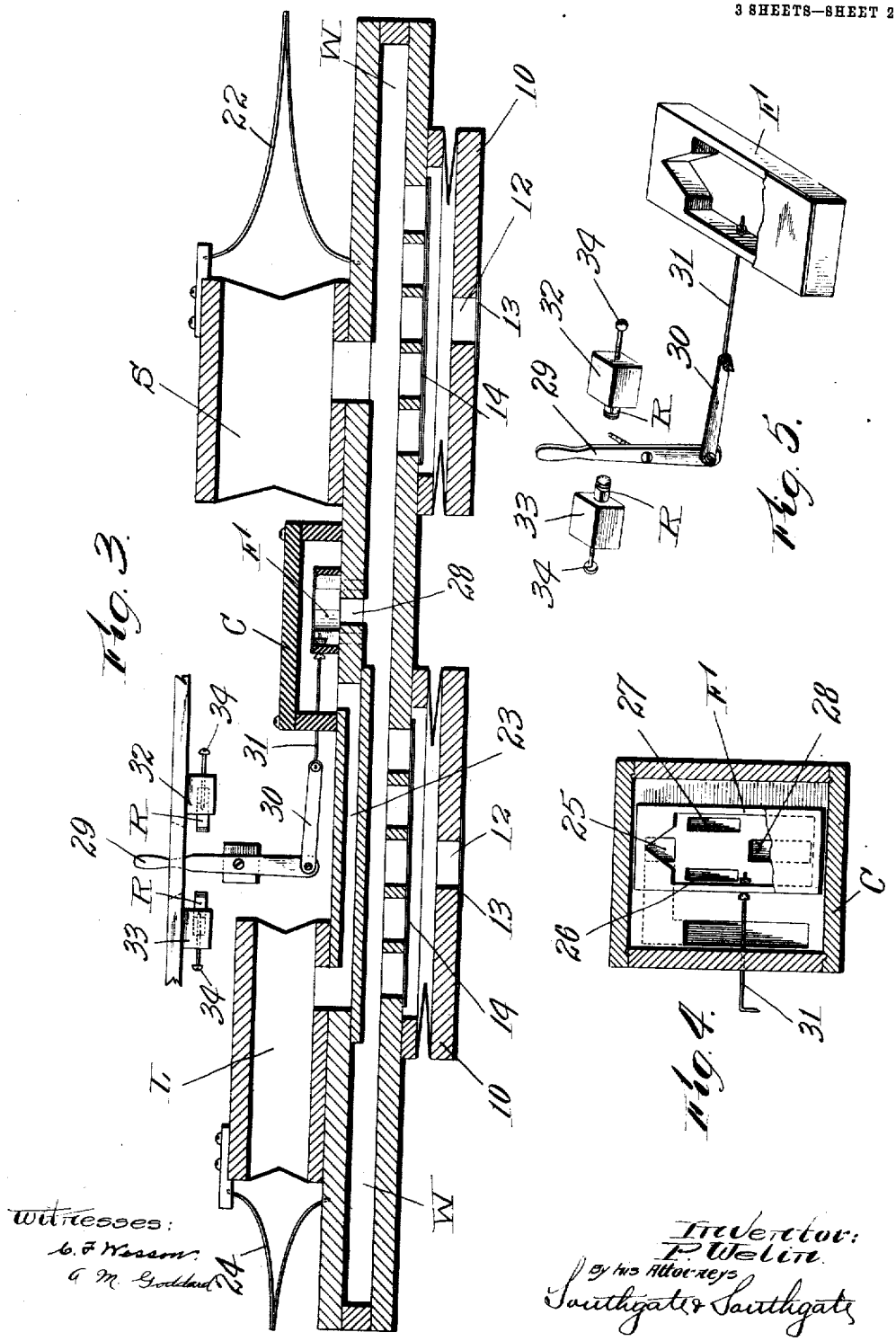

Fig. 3.

Fig. 5.

Fig. 4.

Witnesses:
G. F. Wesson
A. M. Goddard

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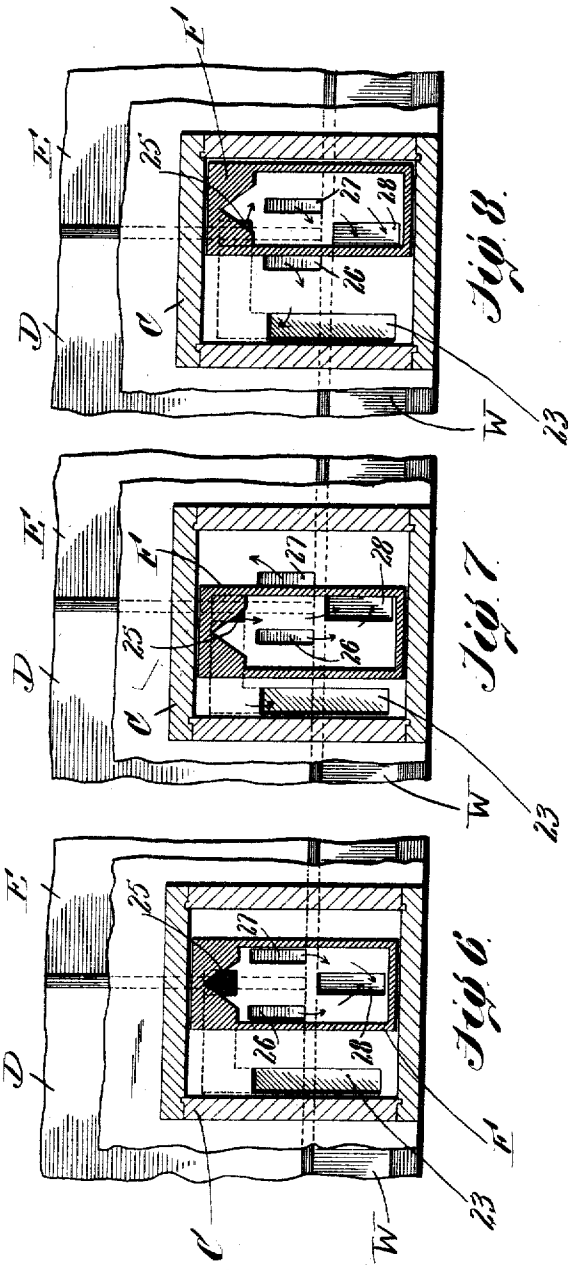

Fig. 8.

Fig. 7.

Fig. 6.

Witnesses:
C. F. Wesson
M. E. Regan.

Inventor:
P. Welin
by Attorneys
Southgate & Southgate.

UNITED STATES PATENT OFFICE.

PETER WELIN, OF WORCESTER, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-HALF TO SIMPLEX PIANO PLAYER COMPANY, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS, AND ONE-HALF TO LAURA A. KRELL, OF NEWCASTLE, INDIANA.

AUTOMATIC PLAYING ATTACHMENT FOR MUSICAL INSTRUMENTS.

945,885. Specification of Letters Patent. **Patented Jan. 11, 1910.**

Application filed November 20, 1903, Serial No. 181,969. Renewed June 15, 1909. Serial No. 502,323.

To all whom it may concern:

Be it known that I, PETER WELIN, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Automatic Playing Attachment for Musical Instruments, of which the following is a specification.

This invention relates to that class of automatic playing attachments for musical instruments which are controlled by strips or sheets of perforated paper.

The especial objects of this invention are to provide simple and efficient means for controlling an automatic playing attachment for musical instruments of the class referred to so that certain notes of a musical composition may be played softly, while other notes are accented or played more loudly; to provide a single controlling mechanism which when shifted to one position will subdue the bass or lower notes, and when shifted to another position will subdue the treble or higher notes; and to provide adjustable stops coöperating with the controlling mechanism, and which may be adjusted to different positions to suit the stiffness of the action of the keys of the instrument in connection with which the playing attachment is to be used.

To these ends, this invention consists of the automatic playing attachment for musical instruments, and of the combinations of parts therein as hereinafter described and more particularly pointed out in the claims at the end of this specification.

In the accompanying three sheets of drawings, Figure 1 is a sectional view of sufficient parts of an automatic playing attachment for musical instruments to illustrate the application of my invention thereto. Fig. 2 is a fragmentary view of a portion of the two separate wind trunks which control the bass and treble notes respectively. Fig. 3 is a sectional view taken on the line 3—3 of Fig. 1. Fig. 4 is a detail view of the valve-box showing the arrangement of ports therein. Fig. 5 is a perspective view of the slide-valve and connections for operating the same. Fig. 6 is a horizontal sectional view showing the controlling valve in normal or central position, Fig. 7 is a similar view showing the controlling valve shifted to the position it occupies when the treble notes are to be subdued or played lightly, and Fig. 8 is a similar view showing the valve in the position it occupies when the bass notes are to be subdued or played lightly.

In an automatic playing attachment for musical instruments constructed according to this invention, the ordinary feeders or foot-operated bellows are connected to exhaust the air from a main wind chest, the main wind chest being provided with the ordinary storage bellows. In addition to this main wind chest, I provide a low-tension wind chest which is normally connected with the main wind chest, and which is provided with a small light tension storage bellows having springs which are of less power than the spring of the main storage bellows.

The operative parts which constitute the action of an automatic playing attachment for musical instruments constructed according to this invention may be of the usual or ordinary construction.

The air tension for the action of the instrument is furnished through two separate wind trunks or air passages. One of these wind trunks is connected to operate the bass or lower notes, while the other wind trunk is connected to operate the treble or higher notes.

The especial object of this invention is to provide simple, inexpensive and efficient means for connecting either one of the wind trunks or air passages either with the main wind chest when the notes controlled thereby are to be struck with full force, or for connecting it with the low tension wind chest when the notes controlled thereby are to be subdued or struck more softly.

The construction which I preferably employ for this purpose consists essentially of a single slide-valve which not only serves the purpose of connecting either wind trunk to the desired source of air tension, but which also serves the purpose of throttling or restricting the connection between the main wind chest and the low tension wind chest. The extent to which this valve may be shifted is preferably limited by adjustable stops, so that the extent of throttling which can be accomplished by this valve may be adjusted

according to the stiffness of the action of the piano keys or other keyboard to which the construction is applied.

Referring to the accompanying drawings for a detail description of an automatic playing attachment for musical instruments constructed according to this invention, as shown in Fig. 1, B designates the ordinary feeders or pedal-operated bellows. Each of these feeders comprises a bottom section 10 which is hinged at its forward end and is provided with valve-openings 12 controlled by the ordinary flap valve 13. The feeders B are each connected with the main wind chest W through a series of ports controlled by a flap-valve 14. At the rear of the wind chest W are the two main wind trunks or passages D and E which are shown most clearly in Fig. 2. The air tension in the wind trunk D controls the striking devices for sounding the bass or lower notes, and the air tension in the wind trunk E controls the striking devices for sounding the treble or higher notes. The operative train for striking each note, as shown in Fig. 1, comprises a channel 15 which may be connected with a tracker-board channel in the ordinary manner. The air is exhausted from the channel 15 through a pin-hole or restricted passage 16. Whenever the tracker-board hole connected with the channel 15 is opened by reason of a perforation in the paper, atmospheric air is admitted to the channel 15, raising the primary valve 17 and admitting atmospheric pressure to the channel 18. The admission of atmospheric pressure to the channel 18 raises a puppet or controlling valve 19 to open a connection between the striking bellows 20 and the wind trunk D. The air tension in the wind trunk D is thus permitted to collapse the striking pneumatic 20 which operates a hammer 21 to depress a key K. This form of pneumatic playing action is of well-known construction, and while I have illustrated my invention applied to control this particular form of playing action, it is to be understood that my invention is equally applicable for regulating or controlling other actions.

The regulating devices which I employ for controlling the air tensions in the two separate wind trunks D and E of the bass and treble of the action, respectively, are most clearly illustrated in the second sheet of drawings. As shown in Fig. 3, I provide a low tension wind chest 23 which is partitioned off from the main wind chest W. Connected with the low tension wind chest 23 is a low tension storage bellows L which has a comparatively light spring 24 tending to expand the same. The spring 24 is preferably considerably weaker than the spring 22 of the main storage bellows S, which is connected with the main wind chest W. On top of the main wind chest W, I provide a valve-box C, and inside the valve-box C, I provide a regulating slide-valve or frame F. The ports which are controlled by the slide valve F are most clearly illustrated in Fig. 4. As shown in this figure, the slide-valve F controls ports 26 and 27 which are connected with the wind trunks D and E respectively before referred to, and a port 25 which connects with the low tension wind chest 23, as shown by dotted lines. The wind trunks D and E have a horizontal partition between them lying immediately at the rear of the main wind chest W, and the wall separating the wind trunks D and E from the main wind chest W in that part of the construction which is below the valve-box is located in front of the ports 26 and 27 and behind the port 28 to be hereinafter referred to as shown by extensions of such partition in Figs. 6 and 7. Also opening inside the frame of the slide valve F is the port 28 which always forms an open connection between the inside of the slide-valve F and the main wind chest W.

The operating connections for the slide-valve F are most clearly illustrated in Fig. 5. As shown in this figure, 29 designates a pivoted lever which is connected by a link 30 to the stem 31 of the slide-valve F. At opposite sides of the lever 29 are blocks 32 and 33. Threaded into the blocks 32 and 33 are screws 34 carrying regulating stops R for limiting the extent to which the lever 29 may be moved in either direction. As hereinafter explained, the regulating stops R are regarded as an important feature of the construction, as by means of these stops, the extent to which the connection between the main wind chest W and the low tension wind chest 23 may be throttled or restricted may be limited according to the stiffness or lightness of the piano action or other keyboard in connection with which the playing attachment is to be used.

The operation of the controlling devices for an automatic musical instrument as thus constructed is most clearly illustrated in the third sheet of drawings. As shown in Fig. 6, when the slide valve F occupies its normal or central position, the main wind chest W will have unobstructed connection through the ports 26 and 27 with the wind trunks D and E before referred to, and through the port 25 the main wind chest W will also have unobstructed connection with the low tension wind chest 23. When the slide-valve is moved from normal position, for example, when moved to the left as illustrated in Fig. 7, the valve passes over the port 27, and will cut off direct connection of the main wind chest therewith, and at the same time, one side of the tapering or V-shaped end of the slide valve will serve to throttle or restrict the port 25. That is to say, when

the valve is shifted to this position, connection will be opened from the low tension wind chest 23 to the wind trunk E which controls the treble notes, and at the same time, the normally opened connection 25 between the main wind chest W and the low tension wind chest 23 will be partly cut off or throttled, the extent of such restriction being limited by one of the regulating stops R before referred to. When the parts occupy this position, the bass notes will be sounded with full force, while the treble or high notes will be subdued and played softly. In the same manner, when the slide-valve F is shifted in the opposite direction, the port connecting with the wind trunk or passage D which controls the bass notes, will be connected with the low tension wind chest, and the opposite side of the V-shaped end of the slide valve F will cut off or restrict the port 25, so that the bass or lower notes will be played softly, while the treble or higher notes will be struck with full force.

In applying my invention to piano players or similar constructions, it will be seen that changes are not required in the operative parts of the action; that a single controlling valve is used to subdue either the bass or treble as desired; and that the degree of throttling or restriction may be controlled by the regulating stops so as to adapt the construction to piano actions of different stiffness.

I am aware that numerous changes may be made in practicing my invention by those who are skilled in the art without departing from the scope thereof as expressed in the claims. I do not wish, therefore, to be limited to the construction I have herein shown and described, but

What I do claim and desire to secure by Letters Patent of the United States is:—

1. In a playing attachment for musical instruments, the combination of key-actuating pneumatics, a wind trunk for the key-actuating pneumatics which sound bass or lower notes, a separate wind trunk or passage for the key-actuating pneumatics which sound treble or higher notes, a main wind chest, a low tension wind chest having a storage bellows connected therewith, both of said wind chests being exhausted from a common set of feeders, and means for connecting either of said wind trunks to either the main wind chest or the low tension wind chest as desired.

2. In an automatic playing attachment for musical instruments, the combination of key-actuating pneumatics, a wind trunk for the key-actuating pneumatics which strike bass or lower notes, a separate wind trunk for the key-actuating pneumatics which strike treble or higher notes, a main wind chest, a low tension wind chest, a normally open connection between said wind chests, and a single controlling device for opening connection between one of said wind trunks and the low tension wind chest and for simultaneously restricting the normally open connection between the main wind chest and low tension wind chest.

3. In an automatic playing attachment for musical instruments, the combination of key-actuating pneumatics, a wind trunk for the key-actuating pneumatics which strike bass or lower notes, a separate wind trunk for the key actuating pneumatics which strike treble or higher notes, a main wind chest, a low tension wind chest, and a single controlling device which when shifted to one position will open connection between one of the wind trunks and the low tension wind chest and simultaneously restrict the connection between the main wind chest and the low tension wind chest, and which when shifted to a different position will open connection between the other wind trunk and the low tension wind chest and also simultaneously restrict the connection between the main wind chest and the low tension wind chest.

4. In a playing attachment for musical instruments, the combination of a main wind chest, a low tension wind chest, separate wind trunks for the striking pneumatics which sound bass and treble notes respectively, and a slide valve controlling ports for connecting either wind trunk to the main wind chest, or to the low tension wind chest, and having a V-shaped end section controlling a port forming a normally open connection between the main wind chest and low tension wind chest.

5. In a playing attachment for musical instruments, the combination of striking pneumatics, separate wind trunks for the striking pneumatics which sound bass and treble notes respectively, a main wind chest, a low tension wind chest, a normally open connection between the main wind chest and low tension wind chest, a slide valve for connecting one wind trunk with the low tension wind chest, and for simultaneously restricting the connection between the main wind chest and low tension wind chest, and an adjustable stop for limiting the extent of such restriction.

6. In a playing attachment for musical instruments, the combination of key-actuating pneumatics, separate wind trunks for the key-actuating pneumatics which sound bass and treble notes respectively, a main wind chest, a low tension wind chest, a slide valve connecting one wind trunk to the low tension wind chest when shifted to one position, and simultaneously throttling the connection between the main wind chest and the low tension wind chest, and connecting the other wind trunk to the low tension wind chest, and also simultaneously throt-

tling the connection between the main wind chest and the low tension wind chest when shifted to another position, and two adjustable stops for limiting the throttling action of the slide-valve.

7. In an automatic playing attachment for musical instruments, the combination of key actuating pneumatics, separate wind trunks for the key-actuating pneumatics which sound bass and treble notes respectively, a main wind chest, a low tension wind chest, a slide valve for throttling a normally open connection between the main wind chest and the low tension wind chest, and for connecting either of said wind trunks to the low tension wind chest; a lever operating the slide valve, and an adjustable stop for limiting the motion of said lever in either direction to thereby limit the extent of throttling between the main wind chest and low tension wind chest to adapt the construction for use with piano or other actions of varying stiffness.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

PETER WELIN.

Witnesses:
PHILIP W. SOUTHGATE,
JOHN F. CROWELL.