

P. WELIN.
 AUTOMATIC PLAYER FOR MUSICAL INSTRUMENTS.
 APPLICATION FILED JAN. 7, 1907.

957,590.

Patented May 10, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

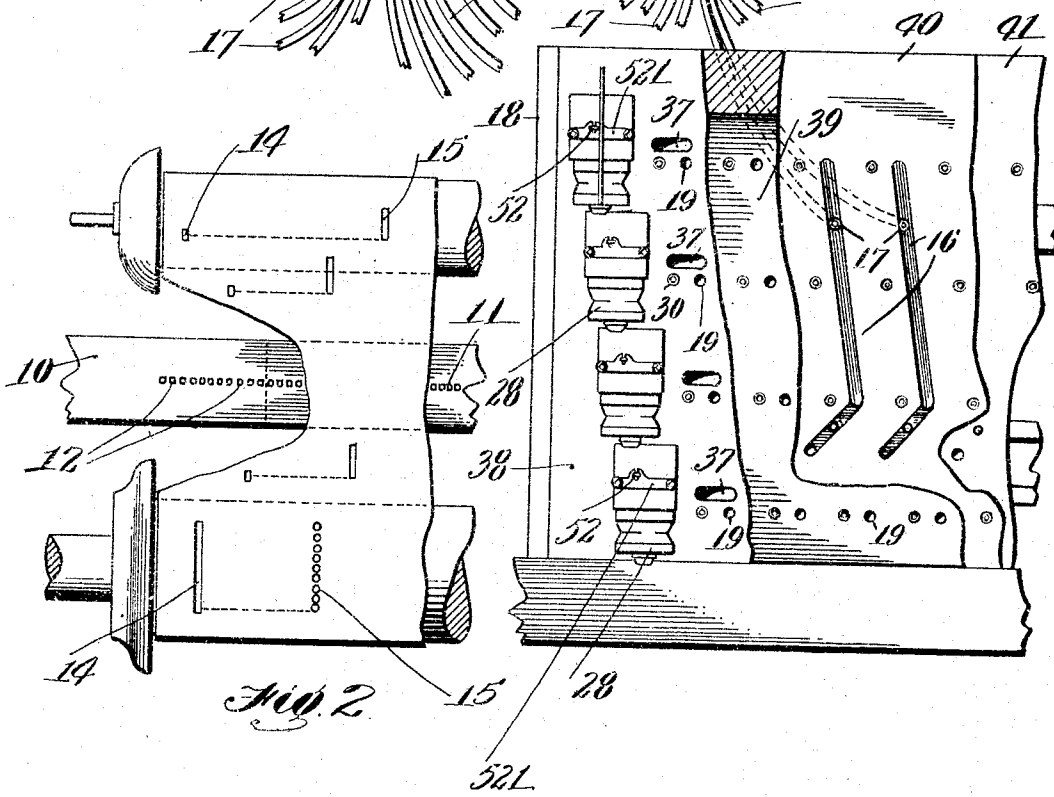
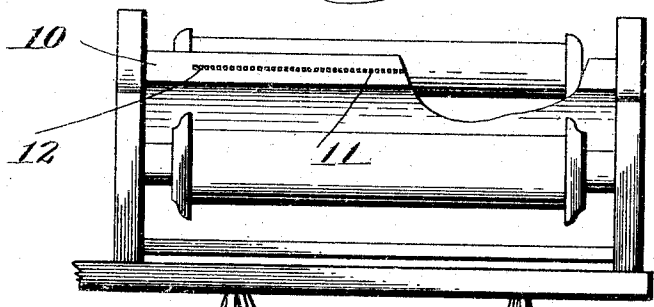


Fig. 2.

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 By Attorneys

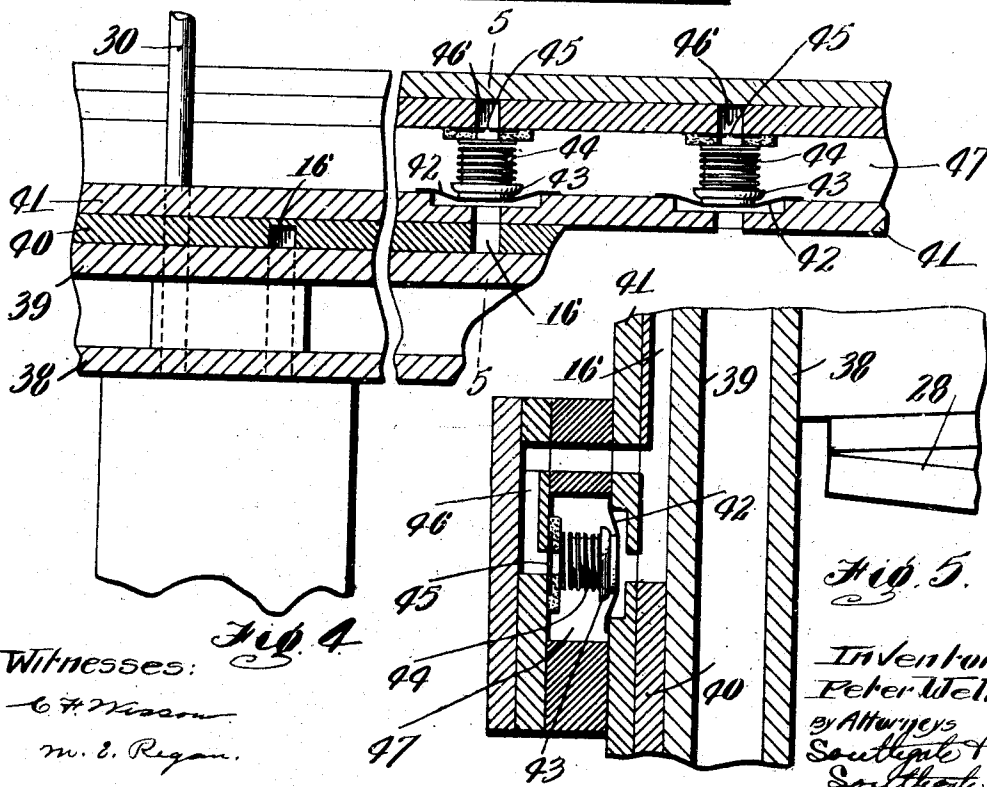
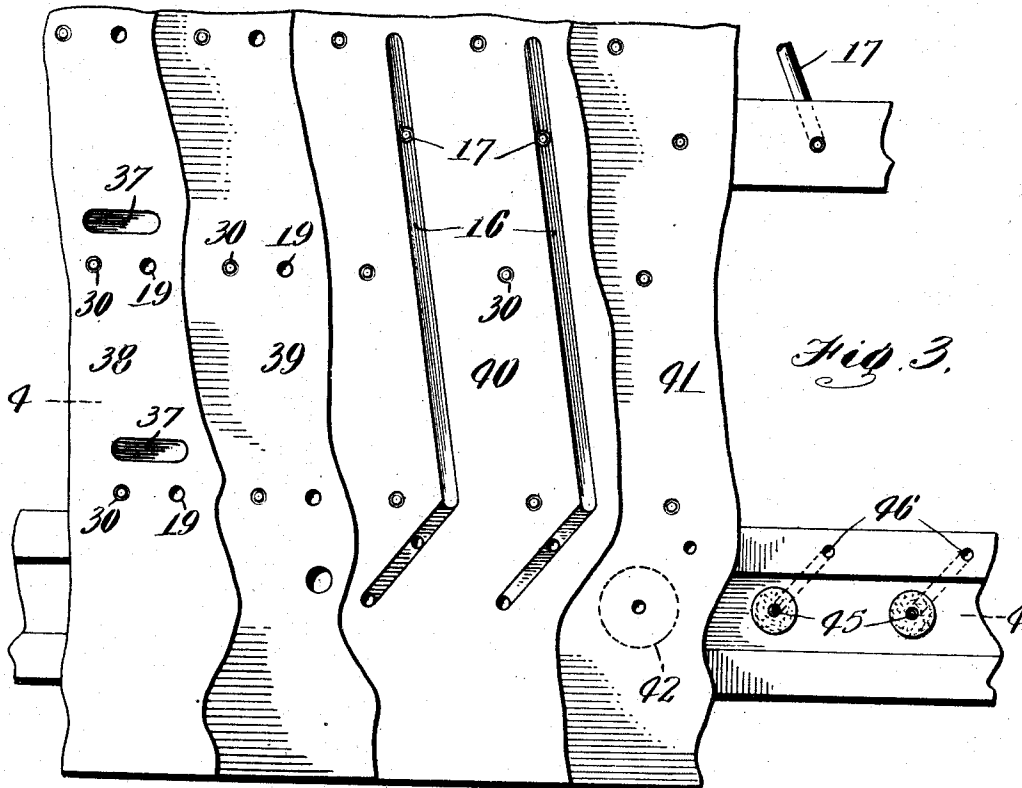
Southgate & Southgate

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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 6.

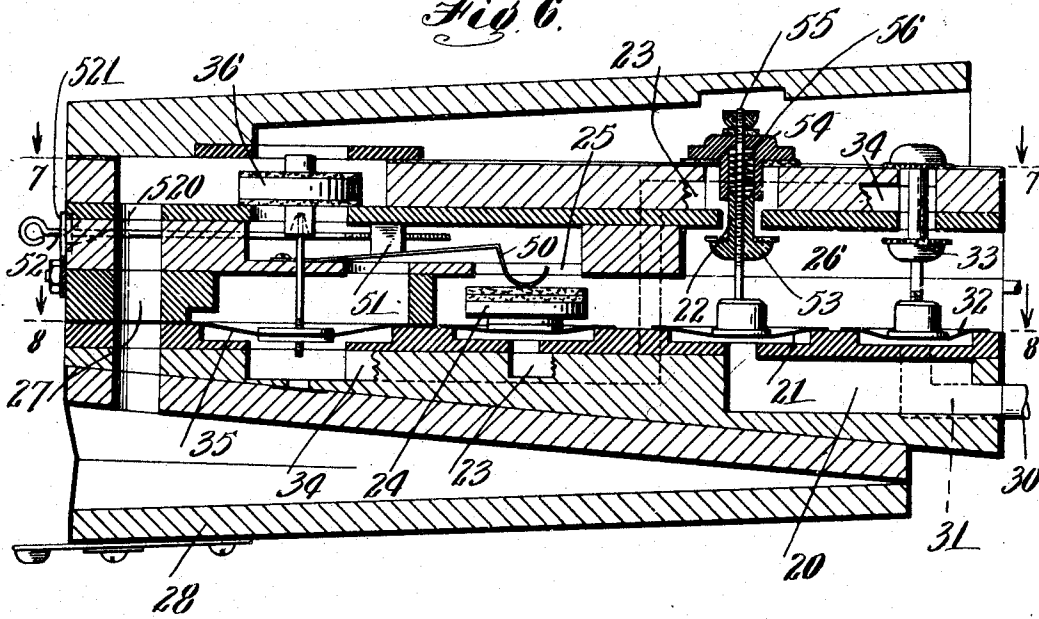


Fig. 7.

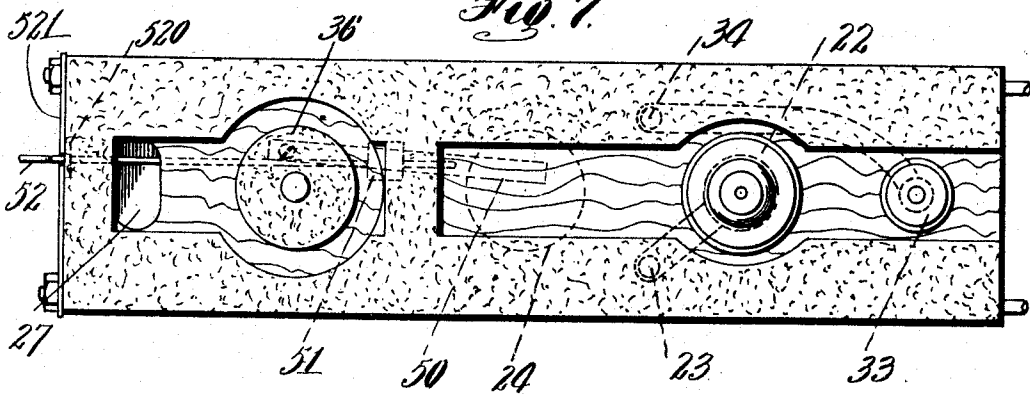
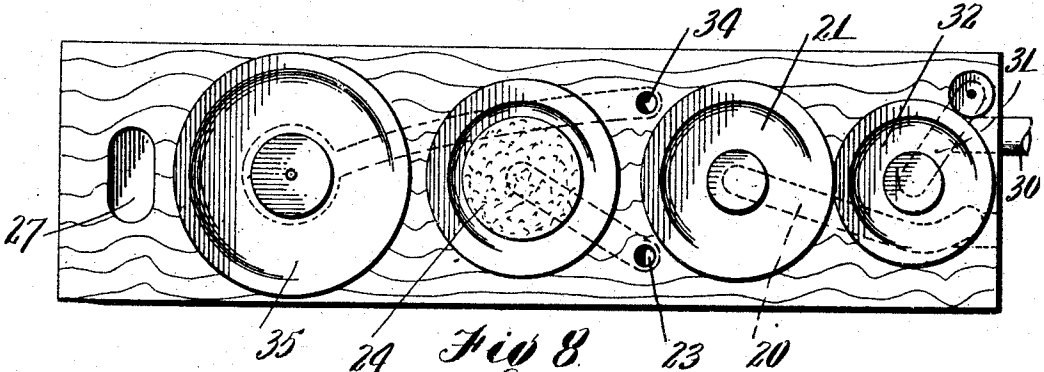


Fig. 8.



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UNITED STATES PATENT OFFICE.

PETER WELIN, OF NEWCASTLE, INDIANA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE KRELL AUTO-GRAND PIANO CO. OF AMERICA, OF CONNERSVILLE, INDIANA, A CORPORATION OF INDIANA.

AUTOMATIC PLAYER FOR MUSICAL INSTRUMENTS.

957,590.

Specification of Letters Patent. Patented May 10, 1910.

Application filed January 7, 1907. Serial No. 351,088.

To all whom it may concern:

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

This invention relates to that class of music playing devices in the form of separate players for operating ordinary musical instruments, and which are controlled entirely from the music sheet and the tracker-bar.

The bleeder and valve box shown herein constitute a part of and are claimed in my co-pending applications, Serial Nos. 351,086 and 351,087, filed Jan. 7, 1907, and are not intended to be claimed in this case.

The principal objects of the invention are to provide such piano players and the like with improved modulating means controlled automatically from extra channels in the tracker-bar, to accomplish this result in a simple and convenient manner, to provide for operating such means to modulate the notes individually or in sections; to provide means for setting the throttling valve in advance of the sounding of the note; and generally, to improve and simplify pneumatic actions for piano players in which the operation of the entire modulating device is controlled from the tracker-bar.

Reference is to be had to the accompanying drawings constituting part of this specification in which,

Figure 1 is a front elevation of a portion of a piano player constructed in accordance with this invention with parts broken away and in section. Fig. 2 is a detail elevation of a part of the tracker-bar and music winding rolls also showing a way in which the music sheet may be cut to produce the modulating effects. Fig. 3 is a front view of the channel board thereof broken away to show portions of each of the plates of which the same is made up. Fig. 4 is a sectional view on the line 4—4 of Fig. 3, showing a bleeder box connected with the channel board. Fig. 5 is a sectional view on the line 5—5 of Fig. 4. Fig. 6 is a longitudinal section of one of the valve boxes for the striking pneumatics, and Figs. 7 and 8 are plans of certain portions of the device shown in Fig.

6 with the parts appearing above the lines 7—7 and 8—8, respectively, removed.

A general description of the construction and operation of a player constructed according to the invention, will first be given.

The tracker-bar 10 is provided with the usual note channels 11 and with an additional series of modulating channels 12. These additional modulating channels may be of the same shape and size as the note channels 11, or likewise. The number of additional channels 12 may be varied within wide limits, according to the manner in which the modulating action is to take effect. In the present instance 22 of these channels are employed, 11 at each end of the tracker-bar, but they may be scattered through the tracker-bar at regular or irregular intervals, as desired.

In order to operate from the perforated music sheet the devices which are connected with the note channels 12, the sheet is shown in Fig. 2 as provided with modulating perforations 14 which are adapted to pass over the several modulating channels. These perforations are preferably made slightly in advance of the regular note perforations 15, provided the note and modulating channels 11 and 12 are in alinement with each other. If the forward edges of the two sets of perforations in the music sheet are in alinement, then the modulating channels 12 are offset slightly from the note channels 11. This is to provide for giving the throttling action a little time to place the parts in position prior to the sounding of the note.

Each of the channels 12 is connected with a modulating channel 16 by means of a pipe or tube 17. The modulating channels 16 are located in the channel board 18 and each one of them is connected with one or more perforations 19. In the present instance, as twenty-two channels 16 are used, each one is shown as being connected with three of the perforations 19 communicating through a channel 20 with a pneumatic 21. (Fig. 6.) This pneumatic operates a valve which controls a channel 23. When the pneumatic is in ordinary position, the valve connects this channel with the suction chamber and when raised it connects it with the outside air, so as to raise a throttling pneumatic 24 to throttle a passage 25 through

which connection is made from a suction chamber 26 through a downwardly extending passage 27 to the striking pneumatic 28 below. Therefore, when one of the channels 12 is opened, the corresponding number of throttle valves are lifted ready to throttle the corresponding striking pneumatics, no other action, however, will take place until a perforation in the music sheet comes over one of the corresponding passages 11. Then an impulse will pass from the channel 11 through a pipe 30 to a passage 31 connected with a primary pneumatic 32 which operates a primary valve 33 to cut off a connection 34 from a suction chamber in which the primary valve is located and connect the passage with the outside air. This sends an impulse to a secondary pneumatic 35 which opens a valve 36 to permit the striking pneumatic 28 to be connected with the suction chamber 26 through the throttled opening 25, at the same time shutting the pneumatic 28 off from the outside air.

It is to be noted that the upper side of the pneumatic 35 is in the chamber which communicates with the suction chamber 26, only through the opening 25. The purpose of this construction is to prevent a thumping action which takes place on the part of the secondary valve in those constructions in which the latter is located in the main suction chamber 26. By having this passage throttled in the same manner as the passage to the striking pneumatic, this thumping action is avoided during the striking of the modulated notes. The suction chambers 26 are connected with a suction chamber in the channel board 18 by means of passages 37, as shown in Fig. 1.

From this general description, it will be seen that the above mentioned objects are accomplished in a simple and efficient manner by the application of the principle of this invention to a piano player.

A more particular description of the apparatus which has been chosen for illustrating the invention, will now be given.

The channel board 18 is preferably made up of a series of plates 38, 39, 40 and 41. In the front board 38 are the perforations 19, 30 and 37, each set of these three perforations being connected with one of the striking pneumatic valve boxes. The section 39 contains the suction chamber which has been referred to, and which is connected with the passage 37. The section 40 contains the channels 16. The back board section 41 is perforated to receive the pipes 17 and also to connect the channels 16 with a bleeder valve box, the object of which is to restore the pneumatics 21 to their normal condition under suction after they have been disconnected from the outer air. The manner in which this is brought about will be seen by

reference to Figs. 4 and 5. Each of the modulating channels is directly connected with a pneumatic 42 on which rests a valve 43 provided with a spring 44 for assisting in returning it to the position which it occupies when there is no air under the pneumatic. At the end of the valve 43 is a perforation 45 connected with a channel 46 which communicates with the modulating channel. The chamber 47 in which the valve is located communicates with the suction chamber and is always under suction. When the end of the modulating channel in the tracker-bar is closed, the chamber 47 communicates through the passage 45 and channel 46 with the modulating channel. When an impulse of air passes into the modulating channel it operates the pneumatic 42 to close the valve and cut the modulating channel off from communication with suction and permits the impulse of air to act on the pneumatics 21 in the manner above described. As soon as the modulating channel in the tracker-bar is closed, the spring 44 tends to push the valve 43 away from its seat and restore the elements to normal condition when the channel 46 will again be connected with the suction so as to bleed the chamber 16. One of these valves is of course used for each of the channels 16.

In Figs. 6, 7, and 8 a construction and arrangement of the primary, secondary, modulating and throttling valves is shown and also their connections with the striking pneumatic and the other elements. Each throttling valve 24 is shown as being normally forced from its seat by a regulating spring 50. As this spring is liable to lose some of its resiliency after some use, it is made with means for adjusting it. In the form shown the spring is mounted so that the stationary arm of it is at an angle with respect to the adjacent wall of the passage in which it is located and between this inclined arm and the wall is located a sliding block 51 which obviously will regulate the spring to give more or less pressure to the throttle valve. For the purpose of moving the block back and forth and adjusting its position, a screw 52 is provided extending outside of the pneumatic so that it can be readily reached for operation. The screw is held in adjusted positions by a nut 520 which in turn is secured by a clamping plate 521 held by the bolts which secure the valve-boxes in position.

The valve 22 is shown as of a differential character. That is, its two valve members, 53 and 54, are movable independently of each other although they are movable together also. The member 53 is adjustably mounted on the valve stem 55 but the member 54 is freely slidable thereon. A spring 56 movably holds said members apart. The action is first to positively close the valve

member 53 and later open the valve member 54 so that connection of the passage 23 with the suction will be closed before the passage is connected to the outside air. Such a
 5 valve may be used in place of valve 33 and in various other places. It will be seen therefore that the construction shown constitutes a practical, efficient and simple embodiment of the principles, as applied to a
 10 piano player.

While I have illustrated and described a particular form in which my invention may conveniently be embodied, I am aware that modifications may be made therein without departing from the spirit of the invention
 15 as expressed in the claim. Therefore, I do not wish to be limited to the particular form shown but

What I do claim and desire to secure by
 20 Letters-Patent is:—

In a piano player, the combination of a tracker-bar having modulating channels and

note channels, a striking pneumatic, means controlled from one of the note channels for operating said pneumatic, a modulating
 25 valve, means controlled from one of the modulating perforations of the tracker for operating said valve, and a music sheet having lines of note perforations, the note perforations which are to be modified, and those
 30 which are not to be modified being in transverse alinement when the corresponding notes are to be sounded simultaneously, and lines of modulating perforations, adapted to travel over the tracker, the modulating perforations being slightly in advance of the
 35 note perforations.

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

PETER WELIN.

Witnesses:

ALMA E. YAGER,
 EDWIN B. PFAU.