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PNEUMATIC SELF PLAYING MUSICAL INSTRUMENT.

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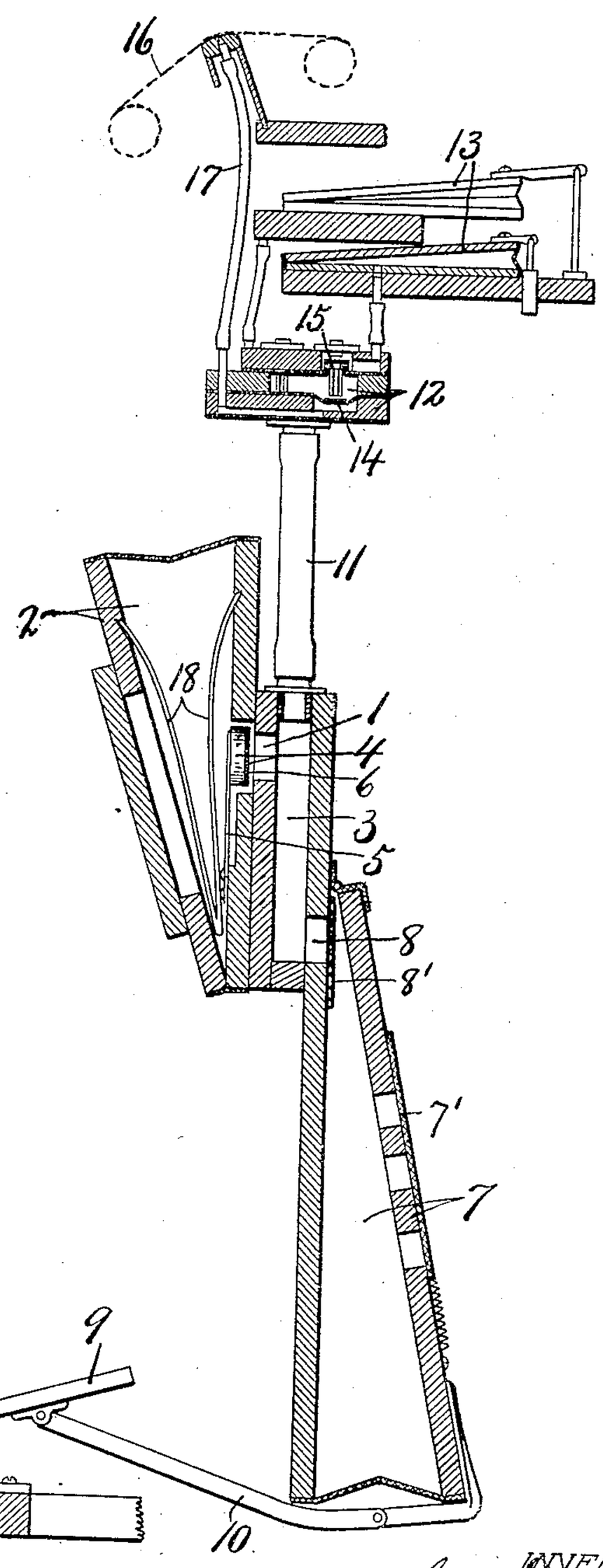

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PNEUMATIC SELF-PLAYING MUSICAL INSTRUMENT.

No. 912,939. Specification of Letters Patent. Patented Feb. 16, 1909.

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To all whom it may concern:

Be it known that I, LEWIS B. DOMAN, of Elbridge, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Pneumatic Self-Playing Musical Instruments, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in pneumatic self-playing musical instruments, and refers more particularly to a pedal accentuating device interposed in the connection between the wind-inducing element and the sound-producing devices whereby a sudden or impulsive action of one or both pedals causes a simultaneous cutting out of a portion of the vacuum chamber normally acted upon, and concentrates the full force of the wind-inducing element through a comparatively small passage to the sound-producing devices.

In this class of piano-players it is desirable to employ what is commonly known, as an equalizer-bellows of sufficient volume to maintain a uniform air tension in the passages leading to the sound-producing pneumatics. This equalizer which is placed in communication with the direct passage between the wind-inducing element and sound-producing devices is always more or less collapsed against the action of a distending spring or equivalent device during the normal action of the pedals and the essential object of my present invention is to provide an auto pneumatic music playing instrument means whereby communication between the direct passage and equalizer may be instantly cut off by a sudden increase of air tension in such passage as produced by a quick impulsive action of the pedal or wind-inducing device connected thereto so that the concentrated and magnified tension may operate instantly upon the sound-producing pneumatics for the purpose of accentuating the notes represented by the apertures in the music-sheet which may be registered with the ducts of the tracker.

In the drawings, I have shown a vertical sectional view of a portion of a self-playing musical instrument embodying the various features of my invention, which consists essentially in providing a communicating port —1— between an equalizer —2— and wind-chest or air passage —3— with a normally open valve —4—, such valve being held in its normal open position by any suitable yielding means consisting in this instance, of a comparatively light spring —5—. This valve —4— is mounted upon the free end of the spring —5— between the port —1— and interior of the equalizer —2—, and is provided with a cushion face —6— adapted to seat against the side of the port facing the interior of the equalizer —2— for the purpose of closing communication between the passage —3— and interior of the equalizer when the air tension in the passage —3— is abnormally increased by a sudden or accelerated action of the pedals acting upon the wind-inducing element. This wind-inducing element may be of any suitable size or construction and in this instance, consists of an ordinary feeder bellows —7— communicating through a suitable port —8— with the passage —3— and adapted to be positively actuated in both directions through the medium of one or more pedals —9— and connecting links —10—.

The wind-passage —3— is connected by a conduit —11— to the wind-chest, as —12—, of the sound-producing devices, as a series of pneumatics —13— which may be arranged to act directly upon the keys of a piano, or may be adapted to operate directly upon the hammer-action, or upon other music-producing devices.

The port —8— is provided with a suitable check-valve 8′ similar to the valve 7′ of the wind-inducing pneumatic —7— to prevent reëntrance of air from the latter bellows.

The sound-producing devices, as the pneumatics —13—, are controlled by suitable primary pneumatics —14— and valves —15— in the wind-chest —12—, the valves —15— being controlled by the primary pneumatics —14—, which, in turn are controlled by a perforated music-sheet —16—, and co-acting tracker-ducts —17— leading to their respective primary pneumatics —14—.

The action of the primary pneumatics —14— and their valves —15— as controlled by the perforated music-sheet and tracker-ducts to alternately connect the sound-producing devices, as the pneumatics —13—

with the wind-inducing element and atmosphere is well understood by those skilled in this art and it is, therefore, unnecessary to enter into a further description of such action.

It will be seen, upon reference to the drawing, that the wind-inducing device —7—, which is actuated by the pedals —9— is in direct communication through the medium of the passage —3— and conduit —11— with the exhaust chamber of the wind-chest —12—, and that the equalizer —2— communicates through the port —1— with the wind-way between the wind-inducing device —7— and wind-chest —12— so that practically the same air tension in the wind-way —3— and wind-chest —12— is maintained in the equalizer —2—, thereby tending to collapse the equalizer against the action of a distending spring —18—. This partial collapse of the equalizer being opposed by the distending spring —18— operates to maintain a more uniform air tension in the wind-chest —2—, and to compensate, in a measure, for excessive demands upon the wind-inducing device as well as for the variable action of such device. It is now obvious that under the normal steady action of the wind-inducing device, a comparatively high tension or strong vacuum may be maintained in the equalizer —2—, wind-way —3— and air-chest —12— without affecting the closing of the valve —4— against the action of its spring —5—, which is adjusted to resist the action of the valve under a normal or predetermined tension, but is sufficiently light or resilient to yield under the action of an excess air-tension tending to close the valve —4—. This excess tension may be produced by impulsive or quick powerful action of the foot upon the pedals, and wind-inducing devices connected thereto, which, in turn, acts upon the valve —4— to draw it against its seat, thereby temporarily closing the port —1— and cutting out or nullifying the effect of the equalizer —2—, and at the same time, diverting the full force of the increased tension directly into the wind-chest and sound-producing pneumatics —13—, which may be in communication therewith. As soon as the excess tension of the air in the wind-way —3— and wind-chest —12— is relieved by the normal action of the wind-inducing device the spring —5— returns the valve —4— to its normal open position.

By cutting out the equalizer —2— by the closing of the valve —4— it is evident that the volume of air to be exhausted by the wind-inducing device is materially reduced and that the full force of the wind-inducing device is brought to bear upon the sound-producing pneumatics —13— which may be in communication therewith for accenting the notes which these pneumatics represent, and that immediately upon reduction of the air tension the valve —4— recedes from its seat, and the action of the sound-producing pneumatics —13— is correspondingly less forcible.

What I claim:

1. In a pneumatic self-playing instrument, a wind-inducing device and a sound-producing device communicating therewith, an air chamber in the connection between said devices, a single yielding valve controlling communication between said air chamber and connection, said valve being normally open under a predetermined air tension and adapted to be closed by a sudden increase of the air tension, whereby said air chamber is cut out of communication with said connection.

2. In a self-playing musical instrument, the combination with a wind-inducing device and an equalizer communicating therewith, a single valve controlling such communication, yielding means normally holding the valve open, said valve being adapted to be closed by a sudden increase of air tension from the wind-inducing device, whereby the equalizer is cut off from communication with the wind-inducing device.

3. In a self-playing musical instrument, the combination of a wind-inducing device and a sound-producing device, including an air chest connected to the wind-inducing device, an equalizer communicating with the wind-inducing device and air chest, a single valve controlling such communication and normally open under a certain air tension, said valve being adapted to be closed by a sudden increase of air tension by the wind-inducing device.

4. In a self-playing musical instrument, a pedal-accenting device comprising a wind-inducing element and its pedal actuating means, an equalizer communicating with the wind-inducing device, an air chest also communicating with the wind-inducing device and equalizer, a single normally open valve controlling communication between the equalizer and wind inducing device and adapted to be closed by quick impulsive action of the foot upon the pedal and consequent increase of air tension by the wind-inducing device.

5. In an auto-pneumatic music playing instrument, a wind-chest or its equivalent, a feeder bellows for exhausting air therefrom, means for manually operating the latter, an equalizer or its equivalent, comprising a single valve for permitting the operator to instantly secure by the abnormal action of the feeder bellows a higher tension in the wind-chest than in the equalizer.

6. In an auto-pneumatic music playing instrument, an action or wind-chest, a feeder

bellows in communication therewith, means for normally equalizing the degree of exhaustion in the wind-chest when the feeder bellows is operating normally, and comprising a single valve controlled by the abnormal action of the feeder bellows for practically nullifying the action of the equalizer.

In witness whereof I have hereunto set my hand this 27th day of February, 1906.

LEWIS B. DOMAN.

Witnesses:
M. E. ELLIOTT,
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