No. 647,926. Patented Apr. 17, 1900.

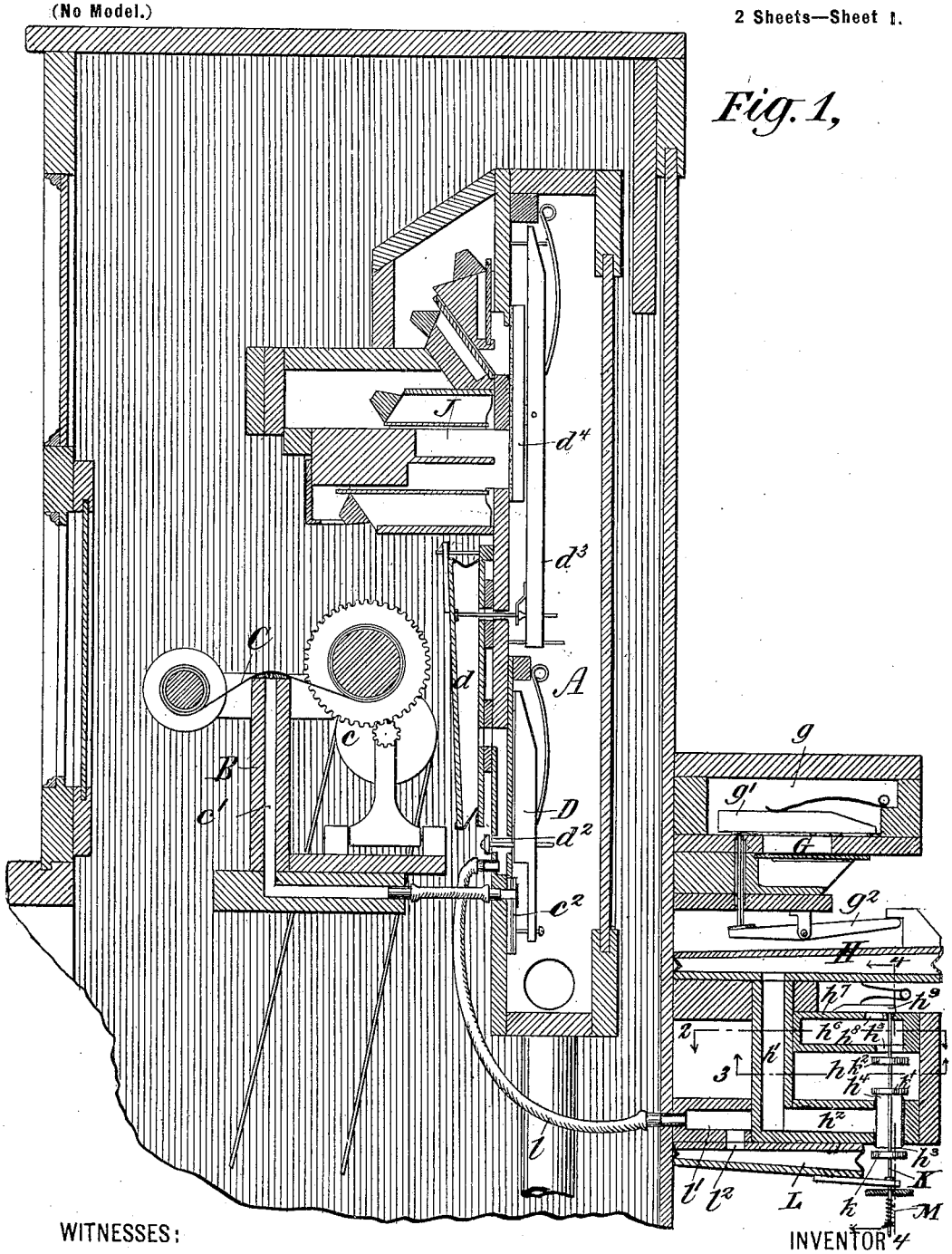
R. W. PAIN.

MUSICAL INSTRUMENT.

(Application filed Apr. 20, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1,



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No. 647,926. Patented Apr. 17, 1900.

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MUSICAL INSTRUMENT.

(Application filed Apr. 20, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 2.

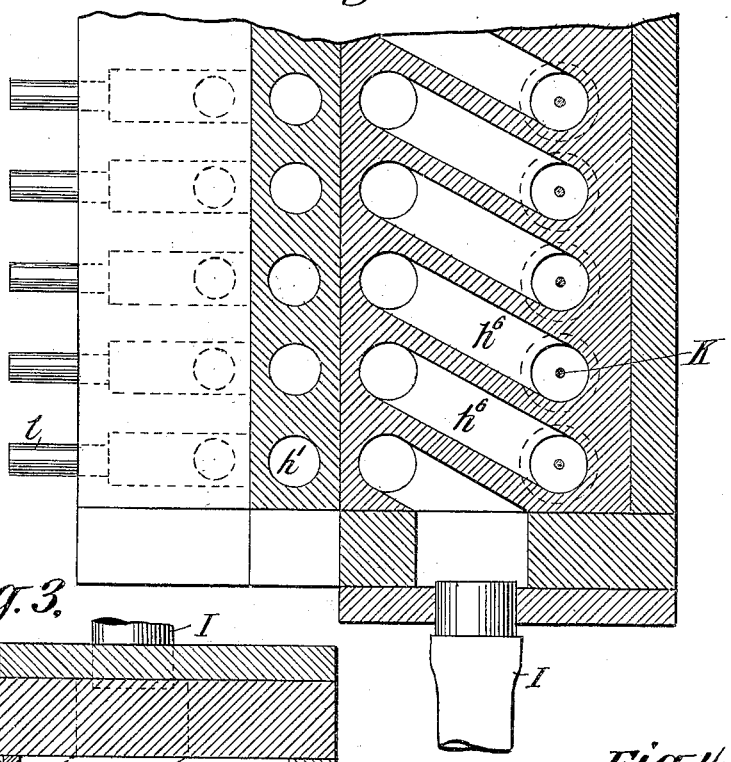


Fig. 3.

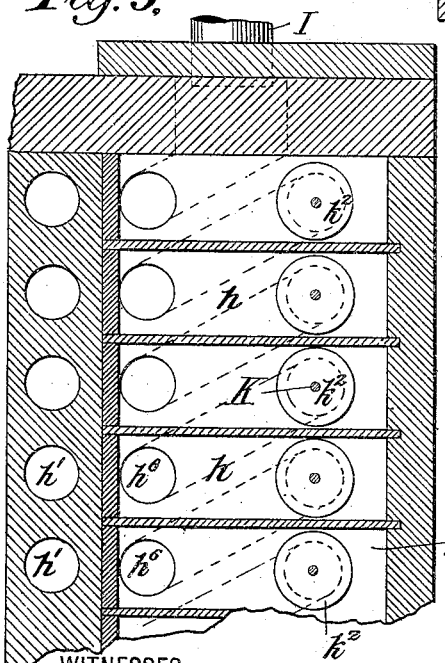
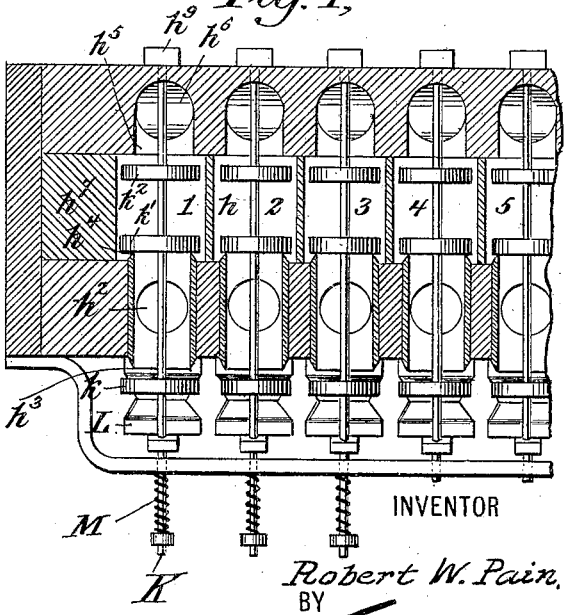


Fig. 4.



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MUSICAL INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 647,926, dated April 17, 1900.

Application filed April 20, 1898. Serial No. 678,228. (No model.)

To all whom it may concern:

Be it known that I, ROBERT W. PAIN, a citizen of the United States, residing at New York, in the county and State of New York, have invented certain new and useful Improvements in Musical Instruments, of which the following is a specification.

My invention relates to musical instruments, and more particularly to a melody-stop for automatic musical instruments.

I will describe a musical instrument embodying my invention and then point out the novel features thereof in the claims.

In the accompanying drawings, Figure 1 is a sectional elevation of a portion of a musical instrument embodying my invention. Fig. 2 is a horizontal sectional view taken on the line 2 of Fig. 1. Fig. 3 is also a horizontal sectional view taken on the line 3 of Fig. 1. Fig. 4 is a vertical cross-section taken on the line 4 4 of Fig. 1.

Similar letters and numerals of reference refer to corresponding parts in all the figures of the drawings.

In the following my invention is described in connection with an automatic organ the reeds of which are caused to speak by an exhaust. It will be understood, however, that the same results could be accomplished by forced air, the operation of the parts being opposite to that described in connection with an exhaust.

A represents an exhaust chest or chamber, B a tracker-board, and C a perforated sheet movable over the tracker-board.

c represents a motor for moving the perforated sheet over the tracker-board. The passages in the tracker-board are in communication with an equal number of passages c', and at the other end of each passage c' is a pneumatic c^2. As the perforations in the sheet pass over the passages in the tracker-board air is admitted to the pneumatics c^2, which then operate to move a train of parts to open the reeds to the exhaust, and thus cause them to speak. The same arrangement of parts is had for each reed, so that the following description of one train of parts will apply equally to all:

D represents a pallet which when it is moved by a pneumatic c^2 opens a pneumatic d to the exhaust A and closes a vent d^2 of the pneumatic to the atmosphere. The pneumatic d in turn moves a lever d^3, carrying a pallet d^4 to open a reed J to the exhaust A, which causes it to speak.

In addition to the set of reeds J of the organ I provide a second or supplemental set or series of reeds of preferably a higher pitch, which I term "solo" or "melody" reeds. These reeds are caused to speak by an exhaust, though forced air may be employed, and they are controlled by the perforated sheet C.

G represents one of the series of solo or melody reeds, g an exhaust chamber or chest, and g' a pallet normally closing the reed G to the exhaust. Each reed G is provided with a pallet g', which is moved by a train of parts. The same arrangement is had for each pallet, so that the following description of one arrangement will apply to all.

H represents a pneumatic, which when it is operated moves a lever g^2 to raise the pallet g'. Passages h' h^2 form a communication between the pneumatic H and a chamber h, which is connected with an exhaust. A valve k', carried by a stem K, normally closes the vent h^4 of the passage h^2 to the chamber h, while a valve k permits a vent h^3 from the passage h^2 to the atmosphere to be normally open. When the valve-stem K is shifted, the vent h^3 will be closed and the vent h^4 opened, so that the exhaust through chamber h will operate the pneumatic H.

L represents a pneumatic for moving the stem K. This pneumatic is in communication with the exhaust A through port l^2, passage l', and tube l, the end of which is closed by a pallet D to the exhaust. Thus the sounding of a reed G is controlled by the perforated sheet C, for when the pneumatic c^2 is allowed to operate a pallet D the pallet D opens a tube l to the exhaust to operate its pneumatic L. As the pneumatic shifts its valve-stem K a pneumatic H will be opened to the exhaust in a chamber h and operated to lift a pallet g'.

In operating the melody-reeds it is prefer-

able that only one reed thereof be sounded at a time, which reed should sound the air or melody note. This I accomplish by having all the chambers h in communication and exhausting through all of them the current passing from the chamber of the lowest note of the bass or subbass through the intermediate chambers to that of the highest note of the treble—that is, the exhaust will be from the chamber h, with which the pneumatic H of the lowest note of the bass is in communication through the chamber h belonging to the pneumatic H of the next lowest note, and so on to the chamber h of the highest note in the treble, with which chamber the exhaust is connected. Thus if the exhaust is broken in its passage through the chambers the pneumatic H belonging to the chamber h next to the chamber h from which the exhaust is cut off will be operated to open its reed to the exhaust through chamber g.

The several chambers h are in communication with each other through channels h^6. As shown in Figs. 2, 3, and 4, the channels are arranged diagonally, so that the opposite ends of adjacent chambers will be connected. The direction of the current through the chambers h and channels h^6 (see Fig. 4) may be described as follows: Beginning for convenience at chamber 3, the current passes up through the port over the front end of chamber 3 into the third diagonal channel, down through the port over the rear end of chamber 2 into chamber 2, through chamber 2 to the front thereof, through the port over the front end of chamber 2, through the second diagonal channel, through the port over the rear end of chamber 1, through chamber 1, through the port over the front end of chamber 1, and through the first diagonal channel to pipe I, so that should the exhaust be interrupted through any one of the chambers the pneumatic H belonging to that chamber would be caused to operate.

On the valve-stem K in each chamber h I have provided a valve k^2 for closing the port between its chamber and the diagonal channel leading from the adjacent chamber in a direction opposite to the direction of the exhaust. I also provide a port or vent for each channel to the atmosphere, which is closed by a pallet h^9. This pallet is moved by an extension of the valve-stem K.

M represents springs on the valve-stems K for returning the valves carried thereby to their normal positions.

The air or melody note is generally the topmost note of a chord, and the perforation of that note is made in the sheet near that edge which passes over the passages in the tracker-board leading to the treble reeds of the organ.

The operation, briefly stated, is as follows: As the perforation indicating the air-note passes over a passage in the tracker-board air is admitted in that passage to operate the pneumatic c^2 at the end thereof to set in operation the train of parts to cause the air-reed of the organ to speak. Simultaneously as the pallet D of that reed is opened the exhaust A operates through the tube l opposite it to collapse the pneumatic to shift the valves on the stem K, connected with it. For example, should the valves in chamber 3 be shifted valve k^2 therein would close the passage h^6, leading from chamber 4 and vent that passage to the atmosphere. The exhaust would then start from chamber 3 and cause the pneumatic H belonging to that chamber to operate and open its reed to the exhaust through chamber g. As long as the valve k' leaves the port h^4 open its pneumatic H will be held collapsed. As soon as the perforation of the melody in the paper has passed over the passage in the tracker-board the air will be shut off from its pneumatic c^2, which will then collapse and allow all the parts to return to normal position.

What I claim as new is—

1. In a musical instrument the combination of a set of reeds or analogous devices, a special set of reeds for emphasizing the air or the bass, each special reed corresponding to one of the first-named set, a pneumatic chamber for each special reed, passages by which an air-circuit may be caused to pass in succession, through pneumatic chambers, a valve for each pneumatic chamber adapted when opened to effect the speaking of the corresponding special reed, a second valve for shutting off the passage connecting with the succeeding chamber, a pneumatic motor for simultaneously operating both the said valves, a second pneumatic motor for causing the speaking of the corresponding reed of the first-named series, a third pneumatic motor controlled by a corresponding channel in a tracker-range, and means operated by said third motor for simultaneously actuating the said first and second motors, whereby when two or more channels of the tracker-board are opened all of the corresponding reeds of the first-named set are sounded, but the first only of the corresponding reeds of the special set is sounded.

2. In a musical instrument the combination of a set of reeds or analogous devices, and an apparatus for emphasizing the lowest or highest of the said reeds sounded, said apparatus comprising a second or special set of reeds, a set of pneumatic chambers, a port for each chamber normally closed by a valve which may be opened to effect the sounding of the corresponding reed of said special set through a pneumatic, a port for connecting each chamber with the next in order and provided with a valve normally open, a port for connecting said pneumatic with the atmosphere and provided with a valve normally open, means for producing an air-current through said pneumatic chambers, and a contrivance for actu-

ating simultaneously the three before-named valves, operated from the first-named set of reeds, whereby when one of those reeds is sounded the corresponding special reed may be sounded, and the air-current cut off from all the succeeding reeds of the said special set.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT W. PAIN.

Witnesses:
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J. EUGENE SONNER.