

W. D. WAMSLEY,
 AUTOMATIC PIANO.
 APPLICATION FILED DEC. 30, 1916.

1,261,329.

Patented Apr. 2, 1918.
 2 SHEETS—SHEET 1.

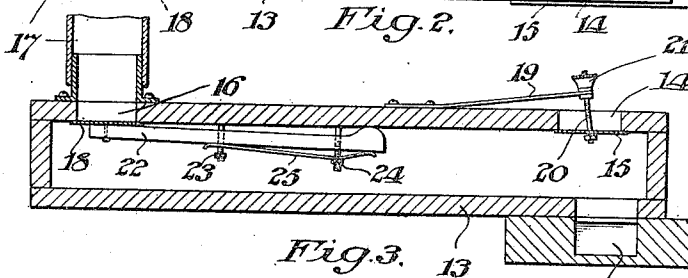
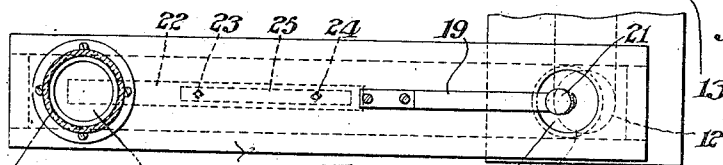
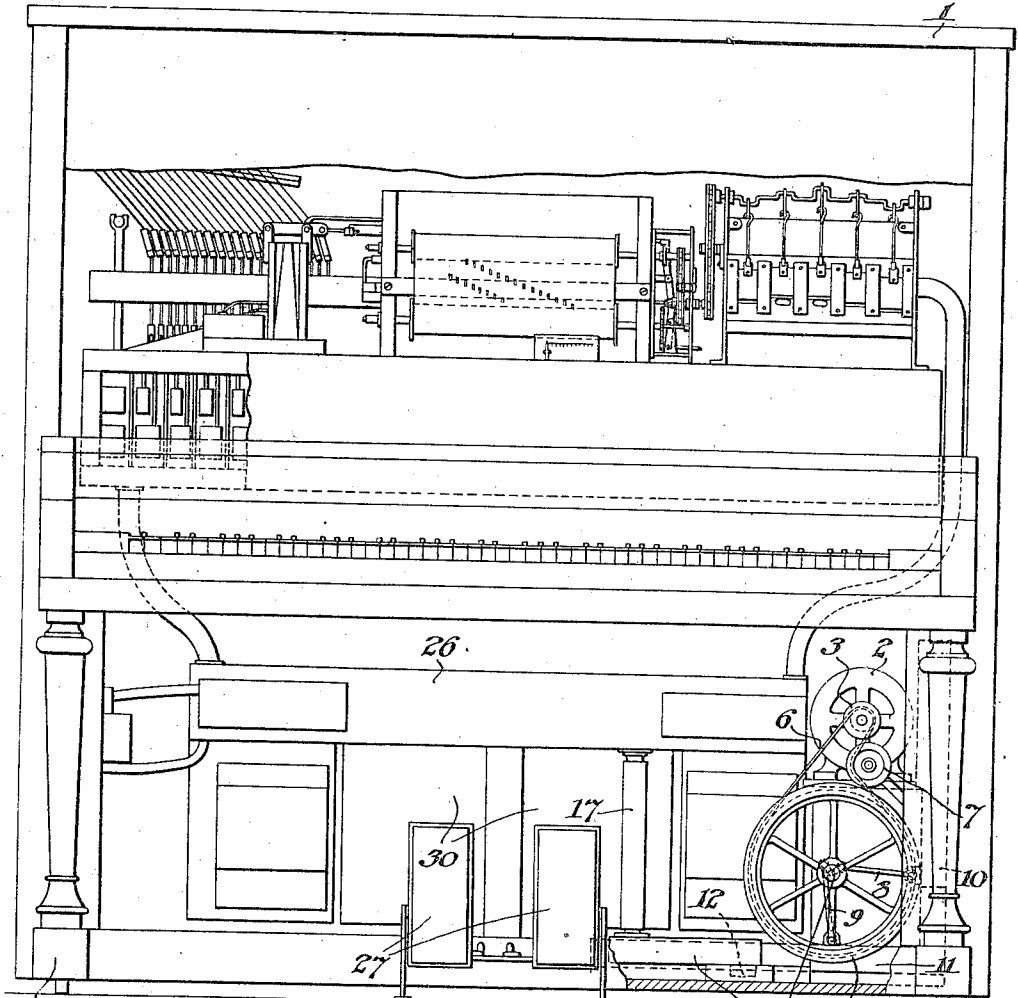


Fig. 1.

Fig. 2.

Fig. 3.

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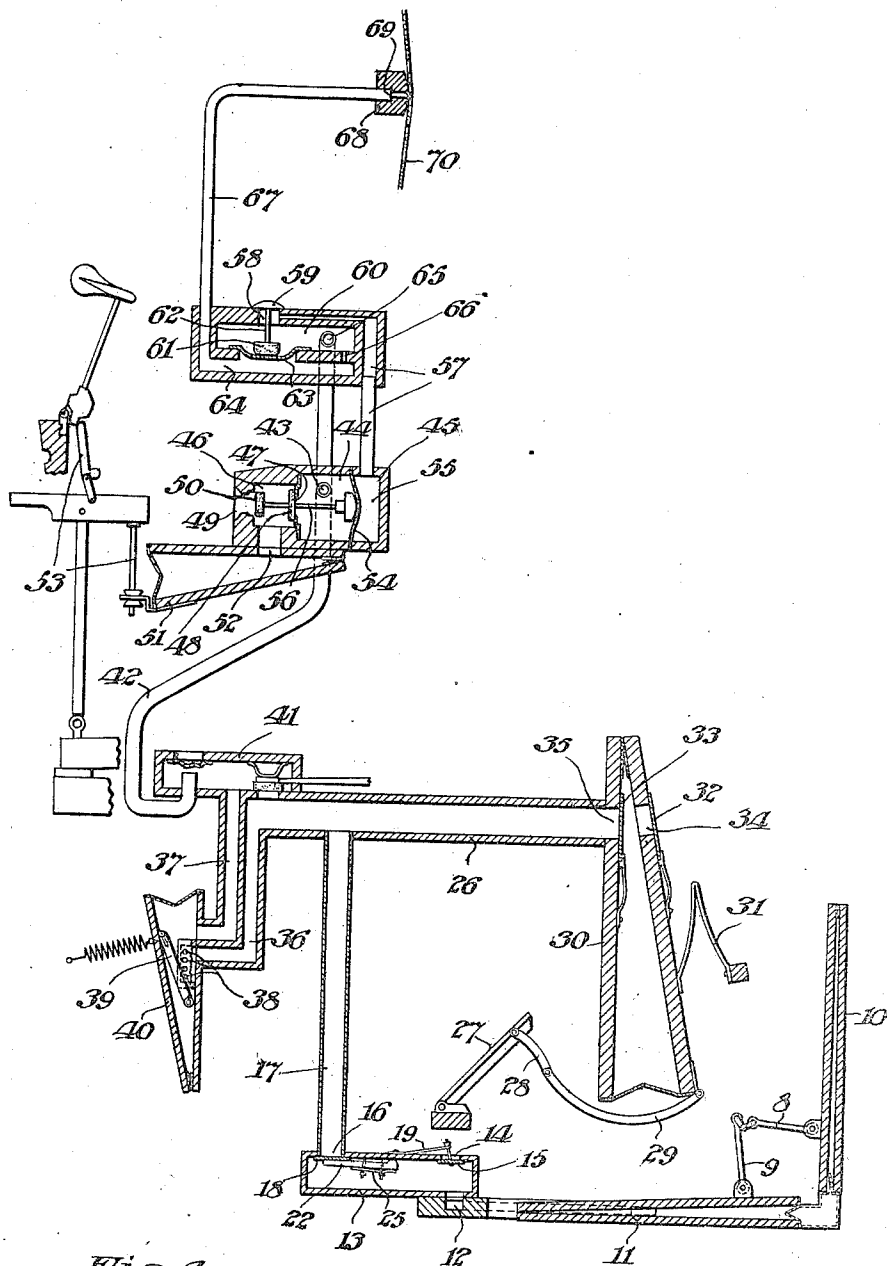


Fig. 4.

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UNITED STATES PATENT OFFICE.

WAYNE D. WAMSLEY, OF LESTER, PENNSYLVANIA, ASSIGNOR TO LESTER PIANO COMPANY, A CORPORATION OF PENNSYLVANIA.

AUTOMATIC PIANO.

1,261,329.

Specification of Letters Patent.

Patented Apr. 2, 1918.

Application filed December 30, 1916. Serial No. 139,874.

To all whom it may concern:

Be it known that I, WAYNE D. WAMSLEY, a citizen of the United States, residing at Lester, Delaware county, Pennsylvania, have invented certain Improvements in Automatic Pianos, of which the following is a specification.

This invention relates to automatic pianos operated pneumatically and its primary purpose is to prevent the application of excessive vacuum to the operation of the player action and to obtain tones of proper modulation.

In the operation of pneumatic pianos, different notes or chords require for their production the admission of different amounts of air, and in the use of a constant speed motor, particularly, there has been heretofore excessive pneumatic action, with a resulting too loud sound, when it is desired to play softly. In another condition, where the power applied is properly regulated to produce certain sounds by means of an appropriate vacuum, this vacuum is insufficient to properly produce certain other sounds.

An object of my invention is to control the pneumatic connections of the manually and mechanically or electrically operated motors with which automatic pianos are equipped so that the piano can be played by either in the desired manner without interference by the other.

The characteristic features of my improvements will be fully understood from the following description and the accompanying drawings of a piano embodying the same.

In the drawings, Figure 1 is a part sectional front elevation of a piano embodying my improvements; Fig. 2 is a part sectional plan view of valve mechanism for modifying the effect of the constant speed motor and securing the desired effect from the action of the manually operated pedal mechanism; Fig. 3 is a longitudinal sectional view of the construction shown in Fig. 2; and Fig. 4 is a diagrammatic view of mechanism embodying the invention.

In the form of the invention illustrated in the drawings, the piano 1 is equipped with an electric motor 2 having a pulley 3 which is connected with a wheel 4 and a crank shaft 5 by a belt 6, the latter being kept under proper tension by a tightener 7.

The crank shaft 5 acts through the pit-

men or connecting rods 8 and 9 upon the respective pumps 10 and 11 which are connected with and exhaust a conduit 12.

The conduit 12 is connected with a valve box 13 which is provided with a port 14 adapted to communicate with the atmosphere under control of a valve 15 and with a port 16 adapted to communicate with the conduit 17 under control of the valve 18.

The valve 15 is held closed normally, so as to open at the desired adjustable pressure, by a spring 19 connected with the valve stem 20 by an adjustable thumb nut 21. The valve 18 is also held closed, normally, so as to open at the desired adjustable pressure, by a lever 22 movably supported by the bolts 23 and 24 together with the spring 25, which is adjustable by the bolt 24.

The conduit 17 connects the interior of the valve box 13 with the interior of the vacuum chamber or chest 26.

The pedals 27, connected by links 28 and 29 with the pumps 30, coact with springs 31 in operating these pumps, which are provided with the valves 32 and 33, for controlling the respective ports 34 and 35, the latter being connected with the vacuum chest 26, whereby the latter is exhausted.

The chest 26 is connected by a conduit 36 with a conduit 37 through the ports 38 controlled by a valve 39 which is operated by the pneumatic governor 40. The conduit 37 is connected with the valve box 41 and this box is connected with the conduit 42 which has the branch 43 connected with the chamber 44 of a box 45. The box 45 contains a chamber 46 which communicates with the chamber 44 through a port 47 controlled by a valve 48, with the atmosphere through a port 49 controlled by a valve 50, and with a bellows 51 through a port 52, the bellows operating the action or striking mechanism 53. A diaphragm 54 separates the chamber 44 from a chamber 55 and is connected with the valve 48 through the stem 56. The chamber 55 is connected by a duct 57 with a port 58 which communicates with the atmosphere under control of the valve 59 and with a chamber 60 under control of a valve 61, these valves being connected by a stem 62 and with a diaphragm 63 which separates the chamber 60 from the chamber 64.

The conduit 42 is connected with the chamber 60 by a port 65, the chamber 60 is

connected with the chamber 64 by a restricted passage 66, and the chamber 64 is connected by the conduit 67 with the tracker bar 68 containing the openings 69 over
5 which passes the perforated music sheet 70.

In operation, the motor 2 acts through the parts 3, 6, 4, 5, 8, and 9 to operate the pumps 10 and 11 which exhaust the conduit 12 and the box 13. The valves 15 and 18 are set
10 so that the former will open only under a vacuum that is in excess of that desired for the operation, and the latter will open freely, under all normal operations of the pumps 10 and 11, to exhaust the vacuum
15 chest 26 through the conduit 17. But when the pedals 27 are used to effect the operation of the pumps 30 and exhaust the chest 26, the pumps 10 and 11 being inactive, the valve 18 is held closed and disconnects the
20 conduit 17 and chest 26 from the box 13, conduit 12 and pumps 10 and 11.

Therefore the desired vacuum can be obtained by operating the pedals, without the modifying influence of the pneumatic
25 mechanism for operation by the motor, and the constant exhausting action of the operating motor pumps cannot produce an excessive vacuum because of the automatic opening of the relief valve 15.

The vacuum in the chest 26 acts in a known manner, through the conduit 36, ports 38 under control of the automatic valve 39, governor pneumatic 40, conduit 37, box 41, conduit 42, chamber 44, chamber
35 60, passage 66, chamber 64, conduit 67 and tracker bar 68, and also through the passage 57 and in chamber 55, the valves 48 and 59 being closed when the sheet 70 closes the tracker bar opening 69.

When the aperture 69 of the tracker bar registers with a perforation in the music sheet 70, there is a rush of air through the conduit 67 to chamber 64 and the diaphragm 63 is elevated, causing the valve 61

to cut off communication between the chamber 60 and conduit 57 and also causing the valve 59 to open communication from the atmosphere through the conduit 57 to the chamber 55. The pressure thus communicated to this chamber acts on the diaphragm
50 54 which opens the valve 48 to connect the vacuum chamber 44 with the chamber 46, thus closing the valve 50 which is fixed to the valve 48. This chamber, with the bellows 51 connected therewith through the
55 port 52, is exhausted and the bellows collapsed to operate the action 53.

It will be evident that, if an excessively high vacuum has been produced, a blow that should be light is struck with too great force by the too sudden collapse of the pneumatic 51. But the relief mechanism described prevents the production of the undesired excessive vacuum, as well as facilitating the production of the desired vacuum by the manual operation of the mechanism when the motor is inactive.

Having described my invention, I claim:

1. In an automatic piano, the combination with a pneumatic system, a manually actuated pump for exhausting said system, a motor operated pump for exhausting said system, a check valve in said system between said pumps, and a relief valve in said system between said check valve and said motor operated pump.

2. In an automatic piano, the combination of a pneumatic system comprising a vacuum chamber, a manually operated pump adapted for exhausting said chamber, a motor operated pump adapted for exhausting said chamber, and a relief valve for limiting the exhausting action of said motor operated pump on said chamber.

In testimony whereof I have hereunto set my name this 28th day of December, 1916.

WAYNE D. WAMSLEY.