

No. 609,362.

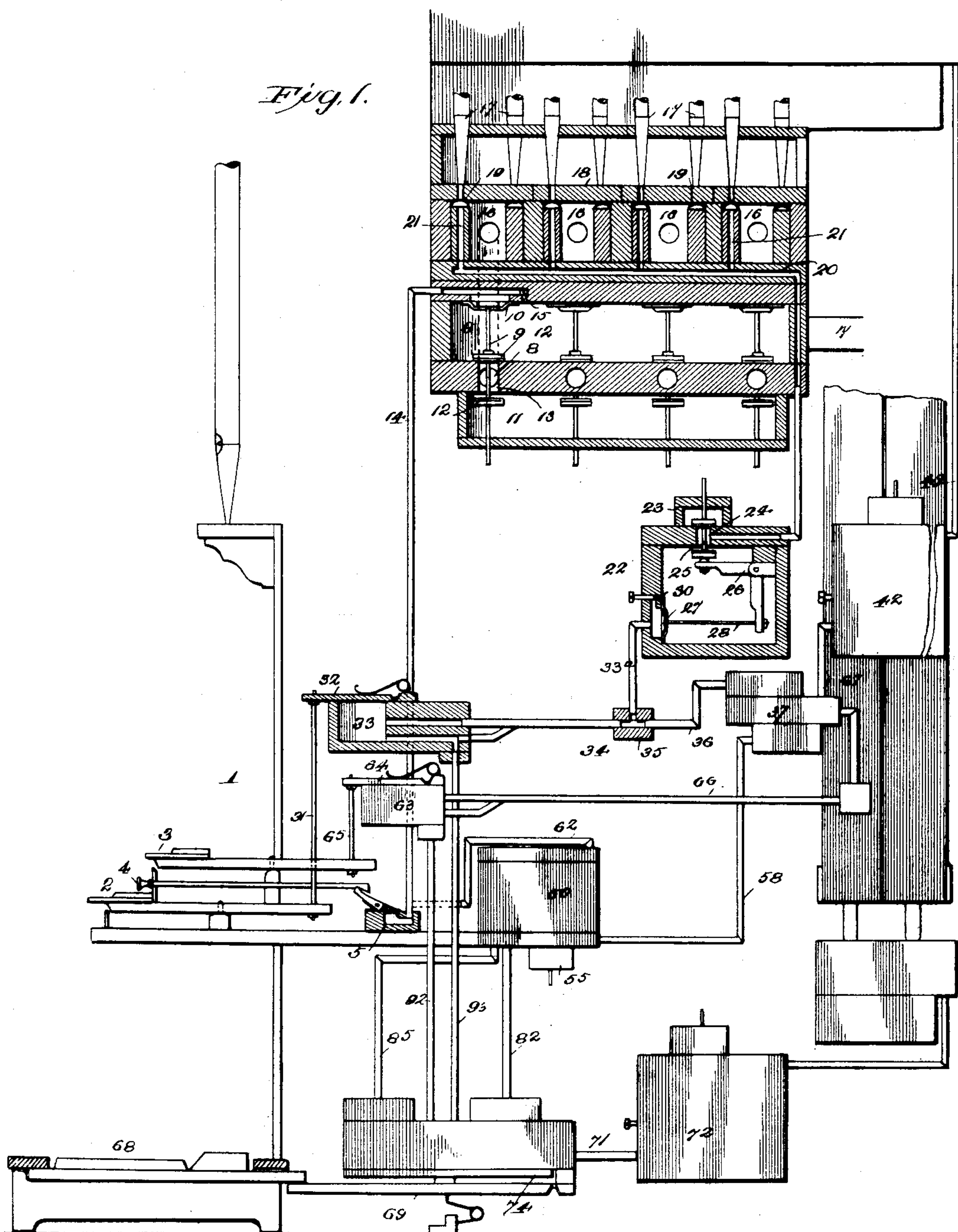
Patented Aug. 16, 1898.

J. NEEF.
TUBULAR PNEUMATIC ORGAN.

(Application filed June 24, 1897.)

(No Model.)

3 Sheets—Sheet 1.



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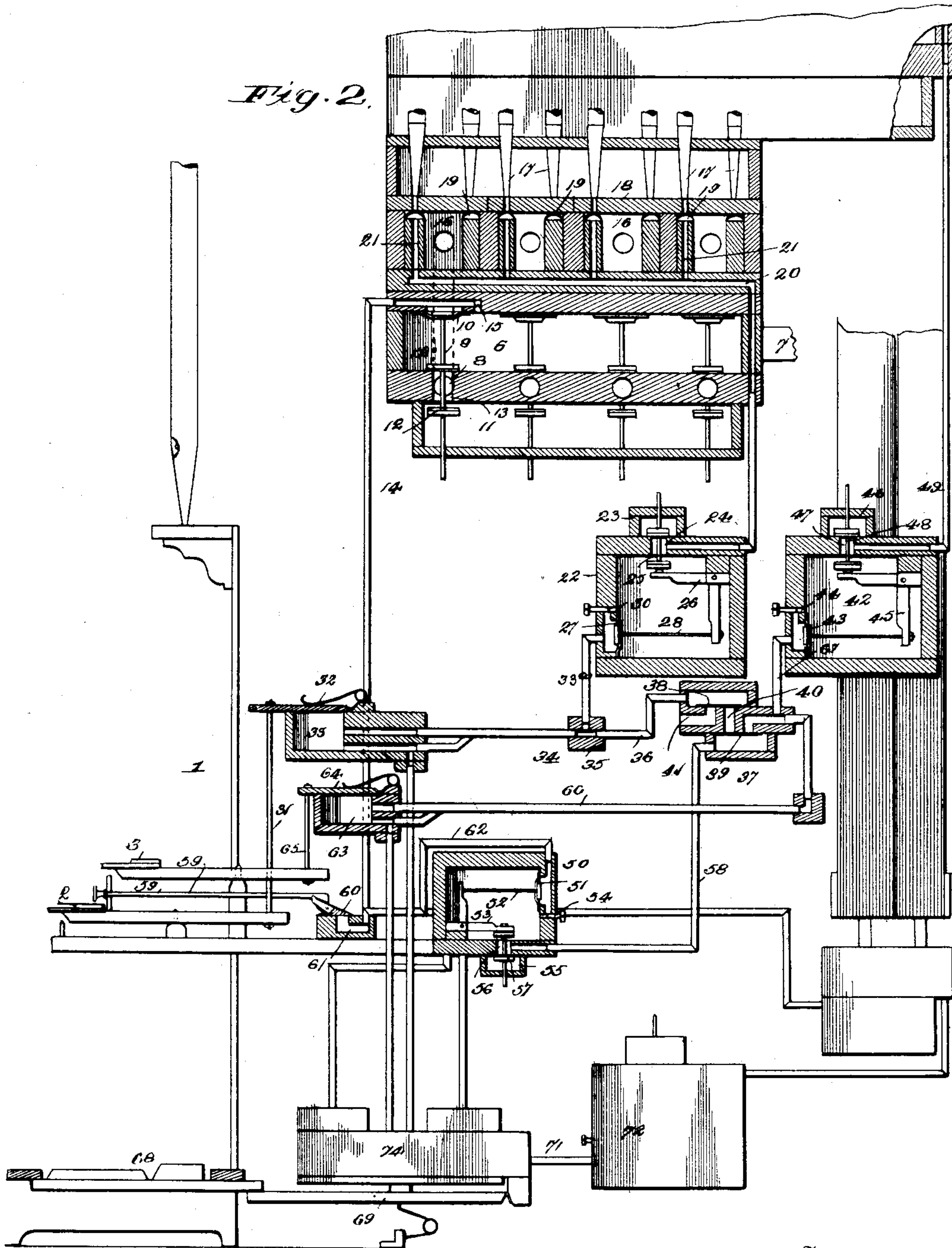
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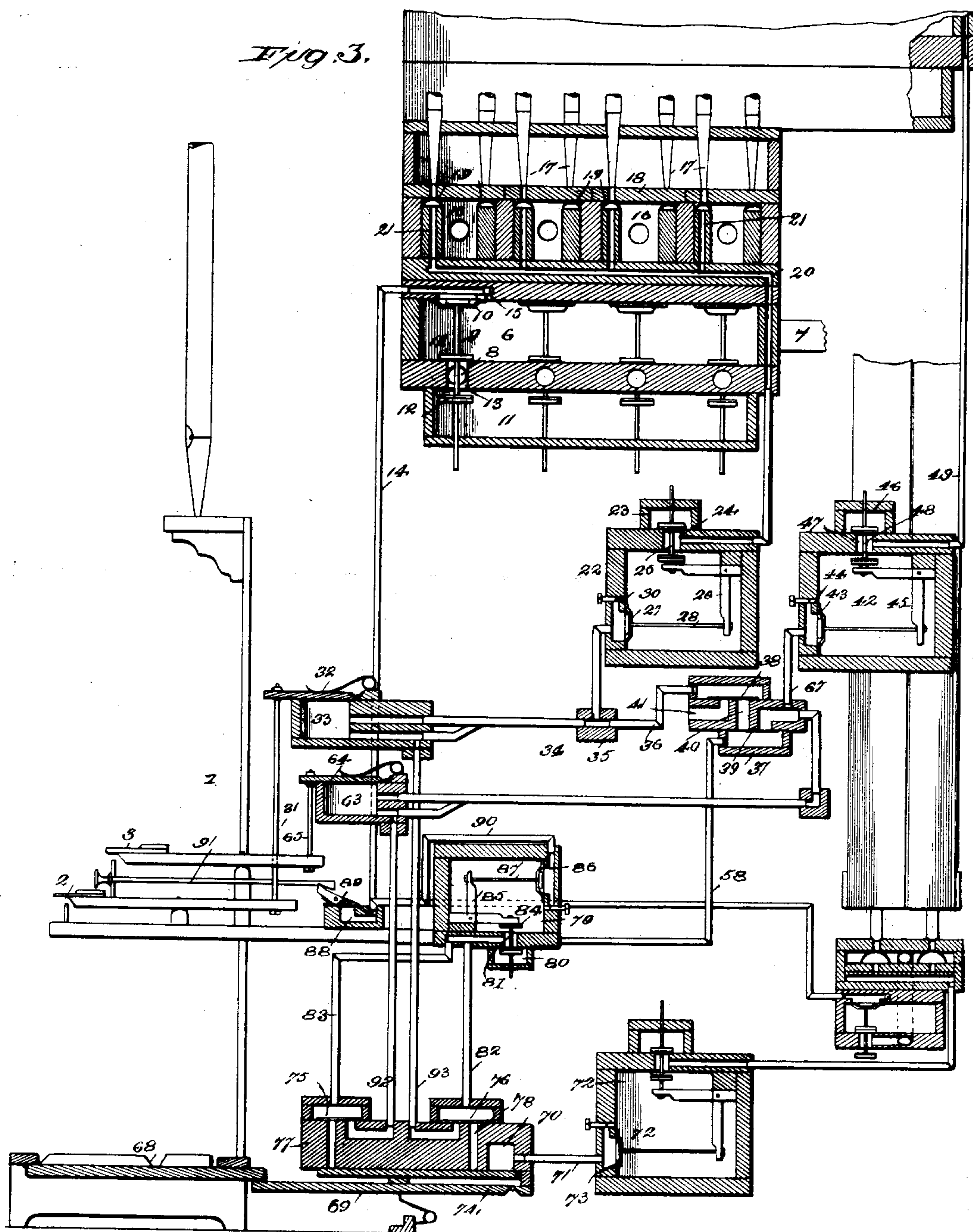
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

JULIUS NEEF, OF PHILADELPHIA, PENNSYLVANIA.

TUBULAR PNEUMATIC-ORGAN.

SPECIFICATION forming part of Letters Patent No. 609,362, dated August 16, 1898.

Application filed June 24, 1897. Serial No. 642,117. (No model.)

To all whom it may concern:

Be it known that I, JULIUS NEEF, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain
5 new and useful Improvements in Tubular Pneumatic-Organs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable
10 others skilled in the art to which it appertains to make and use the same.

My invention relates to organs; and its object is to provide an improved pneumatic means for actuating the speaking mechanism of an organ.

15 My invention consists of certain novel features of construction and combination of parts hereinafter fully described and claimed.

In the accompanying drawings, Figure 1 shows a great-organ used with a simple stop.
20 Fig. 2 shows my method of coupling the great and swell organs. Fig. 3 shows my method of coupling the pedal-organ to one or more of the manual-organs.

In the drawings I have not shown the organ-frame and have only shown such parts as
25 form the elements of my invention. Further, it is not intended that these parts shall bear the exact relationship in regard to position that they do in the drawings, as it will be apparent from the description which will follow
30 that my system will permit of a wide separation of the various parts of the organ without detracting from the promptness of the action.

The numeral 1 indicates a portion of the
35 console of an organ.

The numerals 2 and 3 indicate the keys upon the different manuals, and I have herein shown an organ provided with but two manuals, the numeral 2 indicating the great-organ
40 manual.

A draw-stop 4 is here shown as held between the two manuals. This draw-stop actuates a ventil 5.

A wind-chest 6 communicates with the bellows by means of a wind-trunk 7, which wind-chest I preferably connect with all the stops
45 of one of the organs, although, if deemed advisable to have a difference in pressure, the same may be divided. A conveyance leads
50 from said wind-chest to each of the stops, and pallet 9 controls the admission of air thereto.

Pneumatics 10 are adapted to operate the pallet.

The numeral 11 indicates a trunk leading to the atmosphere. The pallet 9 comprises two
55 leatherned closures 12.

An opening 13 communicates from the wind-chest 6 to the air-trunk 11, and the pallet 9 is held to alternately cover either end of this opening. A conveyance 8 opens into this
60 opening and is thus adapted, by means of the alternate position of the pallet, to be connected with either the wind-chest or the air-trunk.

A conveyance 14 leads from the ventil 5 to
65 the pneumatic 10, there being a separate conveyance and separate pneumatic for each stop.

A bleeder 15 serves to admit air slowly from the wind-chest to the back of the pneumatic.
70

When the bellows is worked, air at the desired pressure, obtained in any of the usual ways, fills the wind-chest 6, passes through the bleeder 15, and fills the pneumatic 10, conveyance 14, and the ventil 5, pressure thus being balanced on either side of the pneumatic-diaphragm. The weight of the pallet combined with the pressure of the air will serve to cause the same to cover the wind-chest end
75 of the opening 13, thus cutting off air from the stop. When the draw-stop 4 is drawn, the ventil 5 is opened and the air under pressure permitted to pass out from the pneumatic 10 through the conveyance 14. The pressure of the air upon the diaphragm, which,
80 it should be stated, is made of greater area than the pallet, serves to raise the pallet, cut off the air-trunk, and permit the wind in the inner chest to pass through the conveyance 8 to the proper stop. When the draw-stop is
85 pushed back into place, the ventil is closed, and the wind passing behind the pneumatic through the bleeder can balance the diaphragm and permits the pallet to close the wind-chest end of the opening end thereof.
90 The wind held under pressure in the stop now passes out through the air-trunk. This will sufficiently show the method of operating any one stop in my device.

Each stop consists of an auxiliary wind
100 chest or channel 16, formed beneath the pipes pertaining thereto. I may be thus enabled

to arrange my pipes directly over the channel and obviate the necessity for conveyancing off the same.

I will now describe the means by which I operate the notes upon the key being pressed. Pipes 17 are arranged upon a soundboard 18, communicating with the channel 16 by means of pneumatics 19. These pneumatics are made in the form of the diaphragm of flexible material, which is adapted when inflated to close the foot of the pipe and which when deflated will be drawn away therefrom, thus permitting the wind in the channel to pass into said pipes and make them speak.

A conveyance 20 extends beneath each note and communicates with the pneumatics thereof by conveyances 21. The pneumatics 19 are preferably formed of a semispherical piece of leather very flexible in its nature. If the air-pressure in the channel 16 be greater than the air-pressure in the conveyance 21, it is apparent that a greater force would be exerted upon the outside area of the pneumatic than upon the inside area; but these pneumatics may be so adjusted as to size that the interior area will be large compared to the exterior area when it is considered that when closed the exterior area subjected to the pressure of the wind in the wind-chest is the total area less the scale of the tube of the pipe. It is apparent, therefore, that the relative sizes of the pneumatics and the tube of the pipe may be so adjusted that a very slight reduction of the pressure in the conveyance 21 will serve to deflate said pneumatic and permit the pipe thereto connected to speak. A wind-chest 22 is connected to an air-trunk 23 by means of a series of openings 24. The conveyance 20, pertaining to a certain definite note, is connected to one of said openings in the side thereof. A double pallet 25 serves to connect this conveyance with either the wind-chest 22 or the air-trunk 23. A square 26, held in the wind-chest 22, serves to actuate the double pallet 25. A pneumatic 27, provided with the sticker 28, serves to move the square. A bleeder 30 permits the wind in the wind-chest 22 to pass therefrom slowly behind the pneumatic and equalize the pressure upon both sides thereof. The key 2 is provided with a sticker 31. A pallet 32 is adapted to be actuated by the movement of this sticker. A vent 33 is normally held closed by the pallet 32 and communicates with the pneumatic 27 of a conveyance 33^a.

The area of the opening leading from the wind-chest 22 to the air-trunk 23 may be so arranged with reference to the scale of the pneumatics 27 that a very slight change of pressure upon one side or the other will serve to operate the pneumatic and cause the valves to open or close. If the key 2 be depressed, the sticker 31 causes the pallet 32 to open and permit the escape of the wind in the vent 33 to the atmosphere. This reduces the pressure in the pneumatic 27 and by means of the

double pallet 25 closes the opening leading from the wind-chest 22 to the conveyance 20 and opens that leading from the pipe 20 to the air-trunk 23, thus permitting the wind in the conveyance to escape and deflate the pneumatic 19, through which the said conveyance leads. Whatever stops are now drawn will speak for that particular note to which the conveyance 20 leads.

It will be apparent that the conveyance 33^a may be made as large as desired, thus permitting the rapid deflation of the pneumatic 27, and it will be also apparent that the opening in the bleeder 30 may be so regulated as to permit a rapid inflation of the same. This in its turn will cause a rapid deflation and inflation of the pneumatic 19, and the organ will speak promptly.

I will now describe the means by which I couple the octaves and couple the manual-organs. A conveyance 34 is provided with a T 35, from which a conveyance 36 extends. A double pneumatic 37 communicates with the conveyance 36. The pneumatic 37 is provided with diaphragms 38 and 39. A passage 40 affords communication between said diaphragms. A passage 41 communicates from the diaphragm 38 to the atmosphere. A wind-chest 42, similar in construction to the wind-chest 22, is provided with pneumatics 43, bleeders 44, and a square 45. An air-trunk 46 communicates with the wind-chest 42 by means of openings 47. A double pallet 48 serves to close either end of said openings, thus affording communications between said openings and the wind-chest or said opening and the air-trunk. A conveyance 49 communicates from said openings to any desired note in the same or any other organ. In this it is intended to represent a connection to another organ, here shown as the swell.

A wind-chest 50, having a pneumatic 51, sticker 52, and square 53, is provided with wind under pressure. A bleeder 54 serves to equalize the pressure on both sides of the pneumatic 51. An air-trunk 55 communicates with the wind-chest 50 by means of an opening 56. A double pallet 57 serves to close either end of said opening. A conveyance 58 communicates from said pneumatic 39 to the opening 56. A draw-stop 59 operates a pallet 60. The pallet 60 closes a vent 61. A conveyance 62 affords communication between the said vent 61 and the pneumatic 51. If the draw-stop 59 be now drawn, the pneumatic 51 will be exhausted, which will move the pallet 57 to close the wind-chest 50 and open the pneumatic 39 to the air-trunk 55. The pneumatic 39 will be then deflated. A vent 63 is provided with a pallet 64. A sticker 65, acting in conjunction with the key 3, serves to open said pallet. The conveyance 66 affords communication from the double pneumatic 37 on the front of the pneumatic 39 to the vent 63. A conveyance 67 affords communication between the pneumatic 43 and the double pneumatic 37 and

conveyance 66. If now the key 3 be depressed, the ventil 63 will be exhausted and the pneumatic 43 deflated through the conveyances 67 and 66. The double pallet 48 will be moved to throw the conveyance 49 in communication with the air-trunk 46, when the pipes in the stops which are drawn will speak.

If, however, the key 2 be depressed, the ventil 33 will be open to the atmosphere, thus deflating the pneumatic 27 and producing the result hereinbefore described. Further, through the conveyance 36 the pneumatic 38 is deflated, when the pneumatic 43 will be deflated through the conveyance 67, opening 40, and passage 41, thus operating the pipes in connection with the conveyance 49. The coupler draw-stop 59 having been drawn permits the deflation of the pneumatic 39. With this arrangement and by means of the double pneumatic but one organ will speak if the key 3 be used, while both will speak when the key 2 is depressed if coupler draw-stop 59 be pulled out. It will thus be seen that with this arrangement I am enabled to use the swell-organ separately or to use the great-organ in combination with the swell. It is obvious also that the pipe 49 might be connected to the notes an octave above the note depressed, when the same would act as an octave-coupler. It is necessary to mention that there should be a separate wind-chest of the type of the chest 22 for each coupler and that there should be a separate double pneumatic attached thereto. It is further necessary to state that whatever couplers may be used the ventil 33 should communicate with all those that either control the same note or control the note desired to be connected with the note normally controlled by the ventil 33. It is also necessary that the ventil 63 should be connected in a like manner.

I will now pass to a consideration of the means by which I operate my pedals. The pedals 68 are made of the usual form and occupy the usual position assigned to them. A back fall 69 communicates with each of said pedals. A ventil 70 communicates, by means of a conveyance 71 and a wind-chest 72, of the usual type, with one of the pedal-notes. The wind-chest 72 is provided with a pneumatic 73, and pallet 74 is attached to the back fall 69 and serves to normally hold said ventil closed. When the pedal 68 is depressed, the pallet 74 is moved to open the ventil 70, the pneumatic 73 is exhausted, and the proper pedal-note speaks. Pneumatics 75 and 76 are located upon the block containing the pedal-ventils. A passage 77 extends from the pneumatic 75 to the exterior of the block containing the ventils and is controlled by the pallet 74. A similar passage 78 extends from the pneumatic 76 in the same manner and is also controlled by the pallet 74. Thus when the pedal 58 is depressed the ventil 70 is open to the air, and also the passages 77 and 78 are open. The wind-chest 79 is situated, preferably, above said pneumatics 75 and 76. An

air-trunk 80 communicates therewith by an opening 81. Conveyances 82 and 83 afford communication from the opening 80 to the pneumatics 75 and 76. A double pallet 84, actuated by a square 85, is held to close either end of the opening 81. A pneumatic 86 connects with the square 85 by a sticker 87. A ventil 88 is provided with a pallet 89. A conveyance 90 affords communication between said ventil and the pneumatic 86. A draw-stop 91 is adapted to control the pallet 89. A conveyance 92 extends from the under side of said pneumatic to the ventil 63 of the swell-organ, and a conveyance 93 extends from the under side of the pneumatic 76 to the ventil 33 of the great-organ. If the pedal-coupler draw-stop be drawn, the pneumatic 86 will be deflated through the conveyance 90. The pallet 84 will be moved to close the inner chest from the conveyances 82 and 83 upon the air-trunk thereto. The pneumatics 75 and 76 will then be deflated. If now the pedal be depressed, the pallet 74 will fall and permit the passage of the wind from the ventils 33 and 63 through the conveyances 92 and 93 and into the air through the passages 77 and 78 as well as deflate the pneumatic 73 and cause the pedal-pipe to speak. The effect of opening the ventils 33 and 63 to the air has been before explained, and it will be plain therefore that when the pedal is depressed all three organs will speak with this arrangement. It is also plain that either one of the conveyances 82 or 83, with its accompanying pneumatic and conveyance to the manual-ventil 33 or 63, corresponding therewith, may be omitted. When this is done, it is obvious that the pedal will then be connected to but one of said organs. The pedal-organ may be coupled as an octave-coupler in a manner precisely similar to the manner described above for the great-organ.

It is obvious that a simple duplication of parts will enable any one skilled in the arts to construct an organ having any number of manuals and that slight changes in the arrangements of the conveyances will enable any desired method of coupling to be had. I do not, therefore, desire to confine myself to the exact couplings and construction herein described, but wish to include all such as properly come within the scope of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an organ, a double-pneumatic valve comprising a casing having therein a pair of chambers, a central opening extending from one of said chambers to the other, lateral openings through said casing each extending to one of said chambers adjacent said central opening, diaphragms held in said chamber each adapted when inflated to cover the end of the central opening and the end of that lateral opening leading to the chamber in which the diaphragm is located and adapted when

both are deflated to permit the passage of wind from one of said lateral openings under its diaphragm through the central opening under the other diaphragm and through the other lateral opening and means for deflating said pneumatics.

2. In an organ, a double-pneumatic valve comprising a casing having therein a pair of chambers, a central opening extending from one of said chambers to the other, openings through said casing each extending to one of said chambers adjacent said central opening diaphragms held in said chambers each adapted when inflated to cover the end of the central opening and the end of that lateral opening leading to the chamber in which the diaphragm is located and adapted when both are deflated to permit the passage of wind from one of said lateral openings under its diaphragm through the central opening under the other diaphragm and through the other lateral opening, a draw-stop constituting means for deflating one of said diaphragms and a key adapted to deflate the other of said diaphragms.

3. In an organ, in combination with a series of double pneumatics each comprising a casing having a chamber therein, a passage leading from said chamber, a second chamber into which said passage opens a passage leading from the exterior to said first chamber and opening adjacent said first-mentioned passage, a passage leading from the exterior of said casing and opening into said second chamber adjacent said first-mentioned passage, diaphragms held in each of said chambers to surround the openings thereinto and adapted when inflated to close the same and when deflated to form, with the three passages a continuous conveyance, a draw-stop, a ventil operated by said draw-stop, conveyances connecting said ventil with each of the series of first-mentioned chambers, whereby the diaphragms contained in the said first-mentioned chambers are simultaneously deflated when said draw-stop is drawn, a series of ventils each operated by one of said keys, and a series of conveyances each extending from one of said ventils to the second chamber of the double pneumatic corresponding to said key.

4. In an organ, in combination with a series of double pneumatics each comprising a casing having a chamber therein, a passage leading from said chamber a second chamber into which said passage opens, a passage leading from the exterior to said first chamber and opening adjacent said first-mentioned passage, a passage leading from the exterior of said casing and opening into said second chamber adjacent said first-mentioned passage, diaphragms held in each of said chambers to surround the openings therein and adapted when inflated to close the same, and when deflated to form, with the three passages a continuous conveyance, a draw-stop, a ventil operated by said draw-stop, conveyances connecting said ventil with each of the series

of first-mentioned chambers, whereby the diaphragms contained in the said first-mentioned chambers are simultaneously deflated when said draw-stop is drawn, a series of ventils each operated by one of said keys, a series of sets of pipes, a wind-chest and air-trunk, a series of openings between said wind-chest and said air-trunk, a series of double pallets each arranged to close either end of one of said openings, a series of pneumatics held in said wind-chest means for connecting each of said pneumatics to a separate double pallet, a conveyance leading from each of said openings between said wind-chest and said air-trunk, branches formed upon said conveyance corresponding in number to the number of pipes in the set to which said conveyance leads, diaphragms held upon said branches to close the lower end of said pipes when inflated and a series of conveyances each leading from one of said pneumatics to the passage extending from the exterior of the casing and opening beneath the diaphragm in the first-mentioned chamber of the double pneumatic corresponding to the set of pipes above referred to.

5. In an organ, in combination with a series of double pneumatics each comprising a casing having a chamber therein, a passage leading from said chamber a second chamber into which said passage opens, a passage leading from the exterior to said first chamber and opening adjacent said first-mentioned passage, a passage leading from the exterior of said casing and opening into said second chamber adjacent said first-mentioned passage, diaphragms held in each of said chambers to surround the openings thereinto and adapted when inflated to close the same, and when deflated to form, with the three passages a continuous conveyance, a draw-stop, a ventil operated by said draw-stop, conveyances connecting said ventil with each of the series of first-mentioned chambers, whereby the diaphragms contained in the first-mentioned chambers are simultaneously deflated when said draw-stop is drawn, manual-keys, a series of ventils each operated by one of said keys, a series of sets of pipes, a wind-chest, an air-trunk, a series of double pallets each arranged to close either end of one of said openings, a series of pneumatics held in said wind-chest means for connecting each of said pneumatics to a separate double pallet, a conveyance leading from each of said openings between said wind-chest and said air-trunk, branches formed upon said conveyance corresponding in number to the number of pipes in the set to which said conveyance leads, diaphragms held upon said branches to close the lower end of said pipes when inflated and a series of conveyances each leading from one of said pneumatics to the passage extending from the exterior of the casing and opening beneath the diaphragm in the first-mentioned chamber to the double pneumatic corresponding to the set of pipes above referred to, pedal-

keys, a series of ventils each adapted to be
separately operated by one of said pedal-keys,
a series of conveyances each extending from
a separate one of the first-mentioned manual-
5 ventils to the corresponding pedal-ventil, a
series of pedal-organ pipes, a pedal wind-
chest, a pedal air-trunk, a series of openings
corresponding in number to the number of
pedal-notes extending from said wind-chest
10 to said air-trunk, a series of double pallets
each held to close either end of a single open-
ing, a series of pneumatics, a series of con-
veyances each leading from a separate one of
said pneumatics to the corresponding pedal-

ventil, a series of conveyances each leading 15
from a separate one of said openings between
said wind-chest and said air-trunk and a se-
ries of pneumatics held upon said convey-
ances and adapted when inflated to close the
pedal pipe or pipes belonging to the pedal- 20
key operating said pneumatics.

In testimony whereof I have signed this
specification in the presence of two subscrib-
ing witnesses.

JULIUS NEEF.

Witnesses:

THOMAS FOWLER,
CHARLES H. DONNING.