

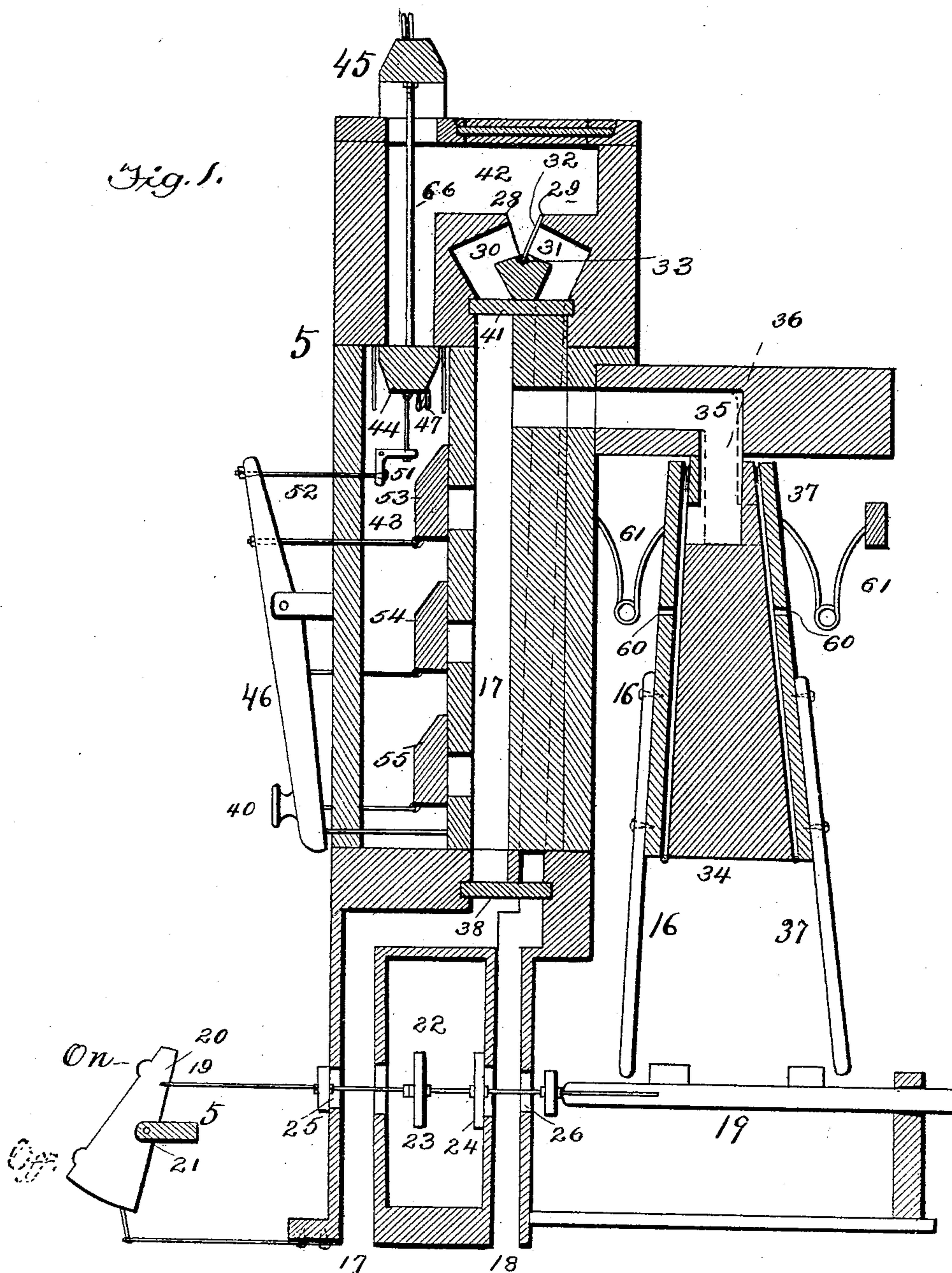
(No Model.)

2 Sheets—Sheet 1.

R. E. PILCHER.
CHURCH ORGAN.

No. 494,593.

Patented Apr. 4, 1893.



Witnesses

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M. C. Hillyard

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By
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

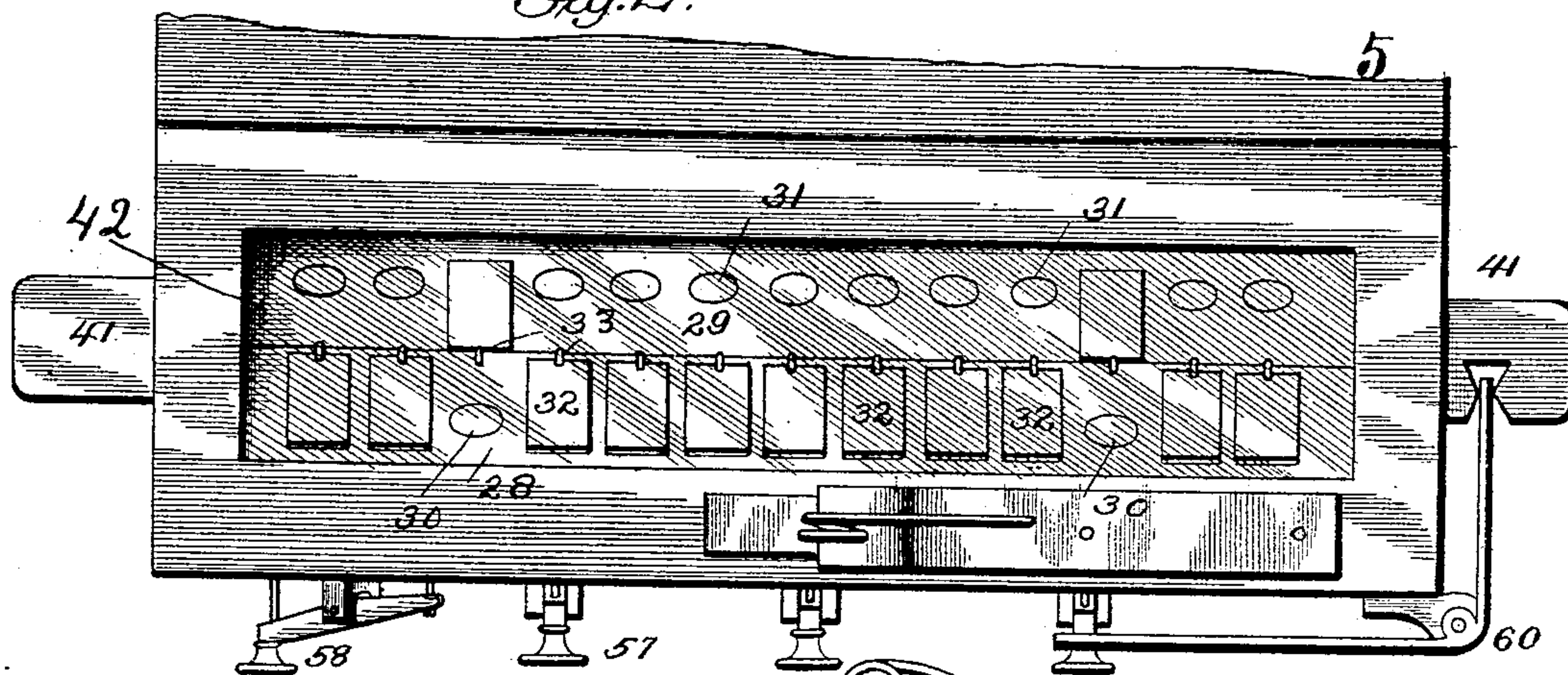


Fig. 4.

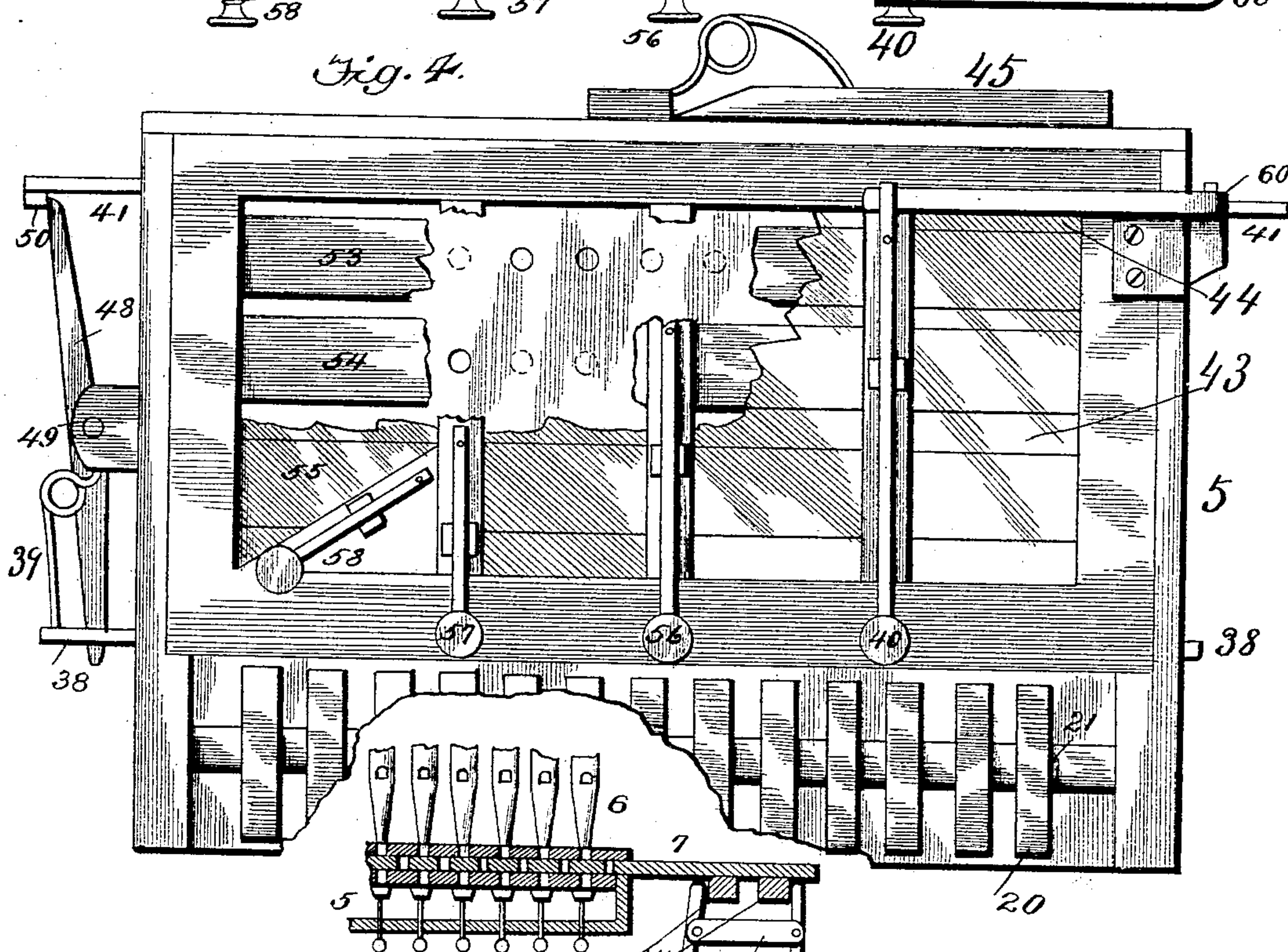
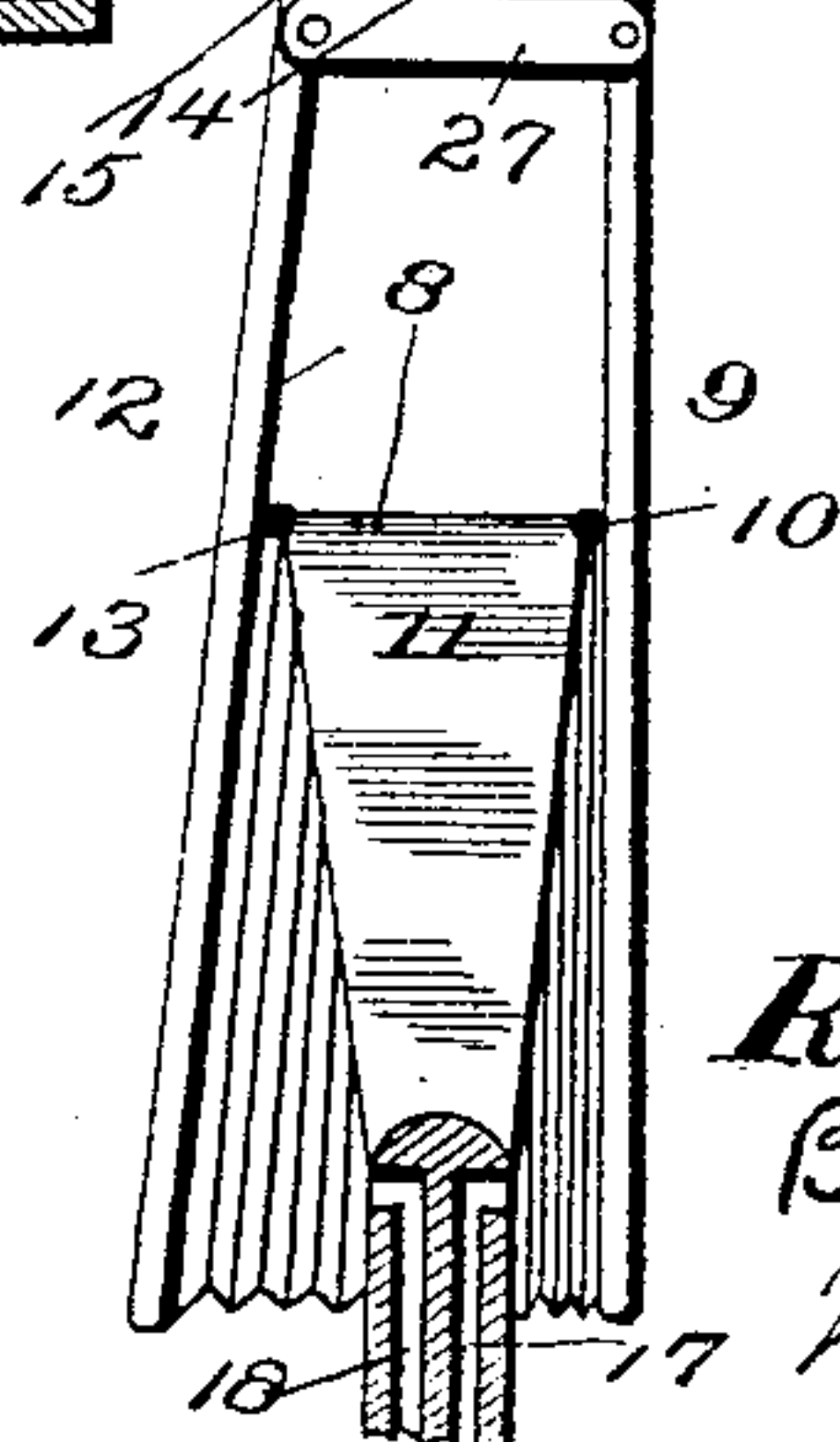


Fig. 3.



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UNITED STATES PATENT OFFICE.

ROBERT E. PILCHER, OF LOUISVILLE, KENTUCKY.

CHURCH-ORGAN.

SPECIFICATION forming part of Letters Patent No. 494,593, dated April 4, 1893.

Application filed September 3, 1892. Serial No. 444,953. (No model.)

To all whom it may concern:

Be it known that I, ROBERT E. PILCHER, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Church-Organs; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to church organs, and its object is, first, to provide means whereby the organist may arrange a number of stops to form special combinations and at a future time set any one of these combinations on by a light touch of the finger, and this object being accomplished whether the individual stops of the special combinations have in the mean time been changed or not, thus leaving all the stops free for use in different temporary combinations, and yet always ready to be restored to any one of the special combinations by a slight touch of the organist's finger, and second, to provide means whereby the organist may at any time throw on any one of a number of set combinations which have been arranged in the construction of the organ.

To this end my invention consists in the construction and combinations of parts forming a church organ, hereinafter described and claimed, reference being had to the accompanying drawings, in which:—

Figure I, represents a portion of an organ according to my invention in vertical section from front to rear. Fig. II, is a top view of a valve chamber. Fig. III, represents in front view the pipes of a single stop, the slide valve which is the active element or stop proper, and a double bellows for operating this slide valve. Fig. IV, is a fragmentary front view partly in vertical section.

5 represents the wind chest or body of the organ, 6 a harmonic group of musical pipes, 7 a slide-valve for closing and opening the ports which admit air to the said pipes to sound them, and 8 a bellows to be expanded by compressed air at the will of the operator, whereby the said slide-valve is operated. Thus far the device may be of any common or known construction, but the means con-

necting the bellows with the valve I prefer to make as follows: The bellows 8 is double, the lever 9 of one-half thereof being hinged at 10 to the central board 11, and the lever 12 of the other half being hinged at 13 to the same board.

27 is a link connecting the two levers whereby the opening of one bellows of a pair will close the other.

14 and 15 represent lugs fixed upon the stem of the slide-valve 7, and 17 and 18 represent air conduits leading respectively into the sides 9 and 12 of the bellows, each conduit being provided with a discharge valve through which the contents of its bellows will be forced out when compressed air is stopped from this bellows and let into the opposite bellows. If air under pressure be admitted through passage 17 the lever 9 will act against the lug 14 to slide and open the valve 7 and thus all the pipes 6 controlled by that valve will be ready for service, and if air under pressure be let into passage 18 the lever 12 will be operated to act against lug 15 and close the valve 7 thus throwing the group of pipes 6 out of action. The organ may have any number of harmonic groups such as flute, dulciana, open diapason, &c., each group being controlled by a valve 7 and bellows 8.

19 is a valve-stem and 20 a stop register key connected therewith and pivoted at 21 to the organ frame.

22 is a chamber supplied with compressed air from any usual source.

23 is a valve upon the stem 19 and it is fitted to open or close a port connecting the passage 17 with the said air chamber 22, and 24 is a similar valve upon the same stem fitted to open or close a port communicating between the passage 18 and the same chamber 22.

25 and 26 are exhaust ports in the passages 17 and 18 respectively and their valves are operated by the same rod 19. Now if the top of the key 20 be pushed in as shown it will register "on" for the stop controlling the group 6 of pipes, the valves 23 and 26 will be opened and the valves 24 and 25 be closed so that air from chamber 22 will enter passage 17 and actuate the bellows 8 to open the valve 7, thus setting the group 6 "on" in accord-

ance with the registry of key 20. Then if the lower end of key 20 be pushed back the positions of all the valves above described will be reversed and air will be let into passage 5 18 to operate bellows 8 to shut off the valve to correspond with the "off" registry of the key 20, and the air in passage 17 will be allowed to be pressed out at port 25. As each stop key 20 controls one harmonic group of 10 pipes I will now describe how these keys may be used to select any desired arrangement of such groups to act in combination at a future time.

42 is a chamber having walls 28, 29 at its 15 lower side, forming angles of about thirty degrees with a central vertical line, and a series of opposite ports in pairs 30, 31 in these walls communicate with air conduits leading respectively to the pairs of conduits 17, 18 of 20 a series of stops, each stop being provided with an "on" conduit 17, and an "off" conduit 18. The two ports 30 and 31 of each stop are directly opposite to each other so that a single leaf-valve 32, pivoted at its lower edge 25 33, will swing over to close either port.

34 is a double bellows operating upon the valve-stem 19 exactly as the bellows 8 operates upon the valve 7, and it is similarly actuated by air received through conduit 35 into 30 one side 16 from conduit 17, and through a similar conduit shown in dotted lines 36 communicating between conduit 18 and its other side 37. The bellows 34 is further provided with small discharge ports 60 from which the 35 air may slowly leak out, and with springs 61 which act upon the bellows to hold them normally closed.

38 is a slide-valve connected with the knob 40 and adapted to close all the conduits 17, 40 18 between the air ports 23, 24 and the combination-works, and a spring 39 tends to hold this valve normally closed; but when the knob 40 is pulled out this valve will open the ports in all the conduits of both 17 and 18.

41 is a slide-valve adapted to close all the 45 conduits 17, 18 between the chamber 42 and the conduits 35, 36, and having ports to open all the said conduits at once, and this valve is also opened by the same movement of knob 50 40 which opens valve 38.

43 is a compressed air chamber communicating with the air chamber 42 by means of a valve 44 which is connected with the knob 40 to be opened by a push thereof, and 45 is an escape valve for the chamber 42 and connected by a rod 66 with the valve 44 to be closed by the motion which opens valve 44, and vice-versa, and 47 is a spring acting on valve 44 to hold it normally closed.

60 The connections between the three valves 38, 41 and 44 and their one operating knob 40 are peculiar in the following described particulars. The knob 40 is attached to a lever 46 which is connected with the slide-valve 41 65 by an elbow lever 60 so that the valve may be slid forward by pulling the knob or be slid backward by pushing the knob. The normal

position of this valve 41 holds all the conduits 17, 18 closed but when slid either forward or backward it opens them all. 70

48 is a lever pivoted at 49, and bearing against a lug 50 upon the valve 41 and connected with the valve 38 so that when knob 40, being pulled, slides the valve 41 to the right the valve 38 will be opened, but when 75 the knob 40 is pushed in beyond its normal position the sliding of valve 41 to the left moves the lug 50 away from lever 48 and the valve 38 is not affected thereby. The valve 44 is connected with the lever 46 by an elbow- 80 lever 51 and a pull-rod 52. The rod 52 is free to play through either the lever 46 or 51 so that the valve 44 is not affected by pulling the knob 40 but is opened by pushing it.

53, 54 and 55 are valves, each covering ports 85 opening into a different series of conduits 17, 18 and forming different combinations to be operated by knobs 56, 57 and 58, and these are termed set combinations. There may be any number of chambers 42 with their acces- 90 sories, each chamber having any number of set combination valves in one organ.

The operation will now be described. Before the organist begins his performance he may select various stops 20 and set them on 95 or off to arrange such combinations as he wishes to sound at once when he arrives at certain passages in the music, and then by pulling knob 40 a puff of wind will be sent up the conduits 17, 18 that have thereby been 100 opened and the leaf valves 32 will be blown away from the selected conduits closing all others. The above may be done relative to each chamber 42 on the organ. Now the organist may proceed to play upon the organ, 105 using any of the individual stops that he desires, or any of the set combinations by use of valves 53, 54, 55, for present effect, without disturbing his arranged combinations, because the valve 41 remaining closed, pre- 110 vents the leaf valves 32 from being changed; but at any time he may throw on any one of his combinations by pushing the knob 40, thus admitting a puff of air through valve 44 115 into chamber 42, and opening valve 41 to permit the air to pass down such conduits 17, 18 as are left open by the set leaf-valves 32, into the bellows 34 whereby all stops of the combination which are not right will be set right. It will now be understood that the same stops 120 may be operated singly, or by the set combinations controlled by the knobs 56, 57 and 58, or by my combination valves 32 each without interfering with the functions of the other. It will also be understood that each of the 125 valves 53, 54 or 55 may be connected when the organ is built, with the conduits 17 of all the stops to be thrown on by that valve, and with all the conduits 18 of the stops to be thrown off, and the wind will immediately 130 act through the corresponding conduits 35 and 36 on the bellows 34 to set right all those valve stems 19 which were not right for that combination, and the bellows 8 will be the

medium of opening or closing all the stops called for as before described, a plurality of air conduits controlled by a single valve being the main characteristic. The keys 20 will be set or left by the action of bellows 34 to register before the eye the condition of the stops, showing which are on and which are off in any combination. By this means the experienced organist may judge of the musical effect which will be produced by any set stop without sounding the organ; and as the same registry of the keys 20 takes place whenever any selected combination is thrown on, the organist may see at a glance the condition of the stops and thereby decide what change if any, he would like to make in their arrangement.

I am aware that other styles of valves, and other styles of connections between them and the knobs or stop keys may readily be substituted for those described and perform similar service, and I do not confine my claim exclusively to them.

As this invention can only be applied to such organs as are operated by air as a medium and is not exclusively limited to church organs I prefer in the claims to use the words "pneumatic organ" instead of "church organ."

The walls 28, 29 may be set at a different angle than sixty degrees the only requirement being that of the leaf-valve when blown away from one port shall gravitate to close the opposite port.

Having thus fully described my invention, what I believe to be new, and desire to secure by Letters Patent, is the following:

1. The combination in pneumatic organs of a stop registry key; one or more air conduits each provided with two valves the one communicating with a compressed air chamber and the other with an exhaust port; a valve-stem connecting the said key and valves and provided with one or more lugs; one or more bellows communicating with the said one or more air conduits, and levers upon the bellows adapted to engage the said lugs, substantially as described.

2. The combination in a pneumatic organ of two air conduits each having an inlet and an exhaust port; a rod having four valves upon it to engage the said ports and further having two lugs; a double bellows the two sides of which are connected respectively with the said air conduits, one side of the bellows having a lever to engage one of the said lugs and the other side of the bellows having a lever to engage the other lug, substantially as described.

3. The combination in a pneumatic organ of an air chamber having ports in pairs along its sides the two ports of a pair being opposite each other; a valve hung between each pair of ports and adapted to close either port of its pairs; a pair of conduits leading from each pair of ports to means for pneumatically setting a stop on or off; means for admitting

compressed air to either conduit of each pair whereby its port in the said chamber will be opened and the opposite port closed, and an independent inlet to said chamber whereby compressed air may be sent through all the ports and conduits thus opened, substantially as described.

4. The combination in a pneumatic organ of an air chamber having opposite ports along its sides; a valve for each port adapted to be opened by air pressure from that port; devices for pneumatically shifting stops; conduits from the said ports to the said stop shifters; a separate inlet for compressed air to each conduit and a valve for each inlet, connected with a stop whereby the valves in the chamber may be set; and an independent inlet for air to the chamber, substantially as described.

5. The combination in a pneumatic organ of a series of stop on-and off operating air conduits entering a common chamber in pairs; a valve for each conduit adapted to be opened by air pressure therefrom; independent means for admitting air to each conduit to set the valves at will; and means for admitting compressed air into the conduits through the chamber by the valves opened, substantially as described.

6. The combination in a pneumatic organ of an air chamber having ports with valves along its sides; conduits from the ports to stop-operating mechanism; inlets for compressed air to the conduits whereby puffs of air may be directed to open certain of the said valves, and an independent inlet for compressed air to enter the chamber whereby it may also enter the open conduits, compressed air from one source first passing backward from the conduit to open its valve, and then from another source passing forward through said opened valve and conduits to actuate the stop-operating mechanism, substantially as described.

7. The combination of an air chamber; a series of valves along its sides adapted to be opened each by a puff of air from without and an independent inlet for compressed air to the chamber substantially as described whereby puffs of air first pass inward to open certain valves and then air passes out of said opened valves to do other work.

8. The combination in a pneumatic organ of a series of stops; a valve and a double bellows connected therewith for each stop; a series of air conduits leading in pairs to the said bellows; an air chamber, and two or more valves each communicating between the air chamber and two or more of the said air conduits substantially as described.

9. The combination in a pneumatic organ of a series of stops; a compressed-air chamber; a series of conduits some of which have ports in the said chamber whereby they are actuated in combination; pneumatic devices adapted to set the said stops and communicating with the said conduits; and valves for

the said ports having one operating knob or key common between all whereby the whole combination may be set substantially as described.

- 5 10. The combination in a pneumatic organ of a compressed air chamber; two or more stops each having a valve to open and close it; a pneumatic device for operating each valve; conduits communicating between the
10 said air chamber and certain of the pneumatic devices forming combinations; and valves operating each as a unit between the said conduits of each combination and the common chamber substantially as described.

11. The combination in a pneumatic organ 15 of a registry action having a plurality of air conduits, two or more of which have ports in a common chamber, and a valve fitted to open or close the said ports collectively, substantially as described. 20

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT E. PILCHER.

Witnesses:

W. S. JONES,

W. M. CHARLTON.