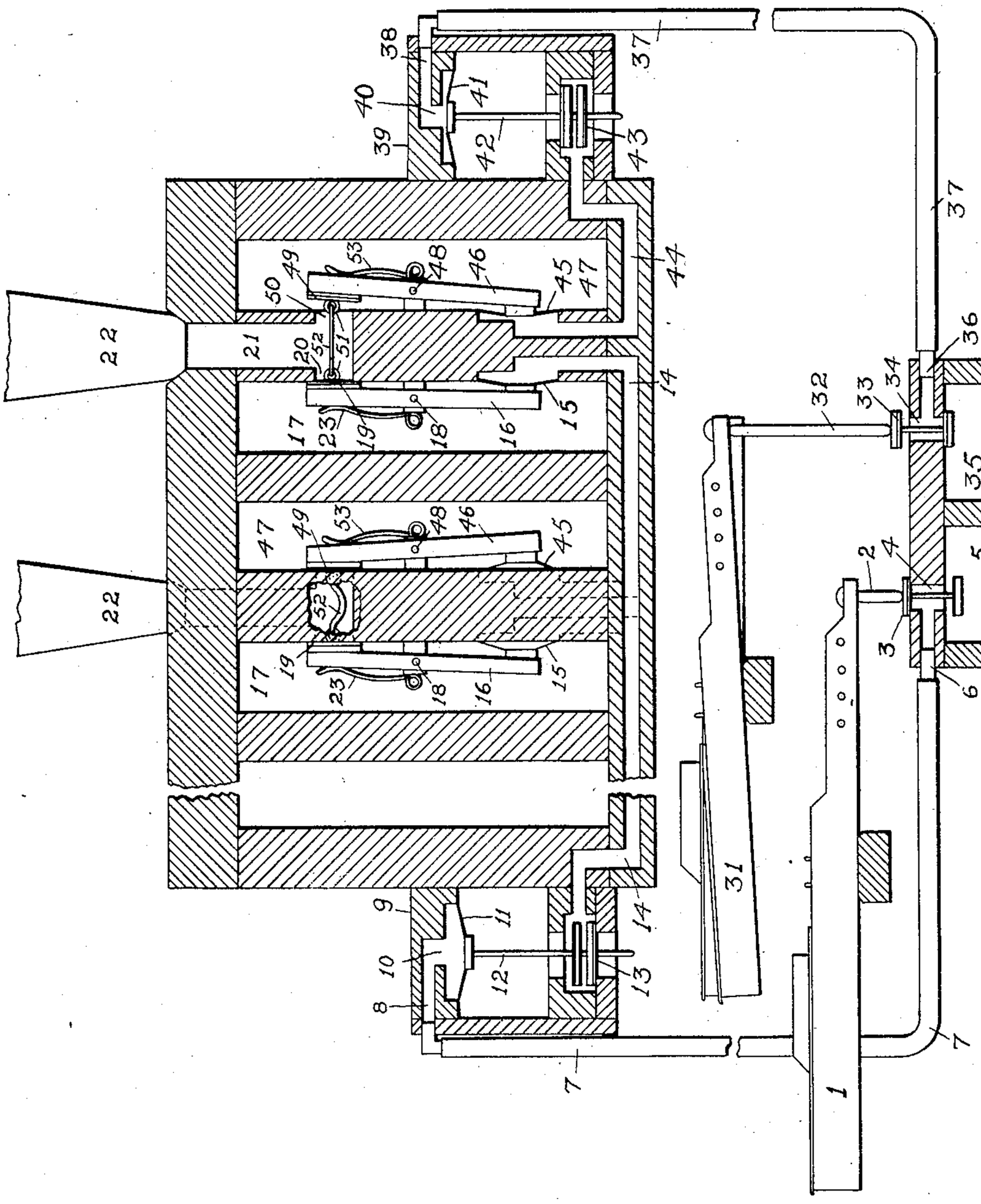
No. 850,635. PATENTED APR. 16, 1907.

A. W. FLEGEL.

PNEUMATIC VALVE FOR MUSICAL INSTRUMENTS.

APPLICATION FILED OCT. 18, 1906.



WITNESSES:

A. K. Schneider

A. L. O'Brien

INVENTOR.

August W. Flegel

BY Dickerson, Brown, Raegener & Binney,

ATTORNEYS.

UNITED STATES PATENT OFFICE.

AUGUST W. FLEGEL, OF CRANFORD, NEW JERSEY, ASSIGNOR TO THE AEOLIAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF CONNECTICUT.

PNEUMATIC VALVE FOR MUSICAL INSTRUMENTS.

No. 850,635. Specification of Letters Patent. Patented April 16, 1907.

Application filed October 18, 1906. Serial No. 339,439.

To all whom it may concern:

Be it known that I, AUGUST W. FLEGEL, a citizen of the United States, and a resident of Cranford, county of Union, and State of New Jersey, have invented certain new and useful Improvements in Pneumatic Valves for Musical Instruments, of which the following is a specification.

My invention relates to pneumatically-actuated musical instruments, and particularly to the valves used therein for controlling the speaking of the sounding devices. Its object is to enable each of the sounding devices to be operated by a plurality of independent means, as banks of keys, sets of ducts in a tracker, or the like.

A further object of the invention is to prevent any opening or fluttering or improper movement of the valve or valves not in operation at any particular moment.

Further objects of the invention will appear in the specification and be pointed out in the claims.

I have illustrated my device as applied to a pipe-organ; but it is of course obvious that it is not so limited nor is it limited to a manually-controlled instrument.

In the drawings, 1 designates a bank of keys, which may be the ordinary great or swell manual of a reed or pipe organ. At the rear end of each key 1 is a rod 2, bearing upon a double valve 3, which passes through a port 4, leading into a pressure-chamber 5. From the duct 4 a passage 6 connects, by means of a flexible tube 7, with a passage 8 in a valve-chest 9, the passage 8 leading to a recess 10, which is closed by a diaphragm 11, connected by a stem 12 to a double diaphragm or puppet-valve 13, which is adapted to alternatively admit air under pressure from the chest 9 or atmospheric air into a passage 14, the inner end of which is closed by a diaphragm 15. The diaphragm 15 bears against a lever 16 in a wind-chest 17, into which either pressure or atmosphere are admitted at will, as usual, the lever 16 being pivoted at 18 and carrying at its other end a valve 19, which acts to open and close a lateral port 20, leading into a passage 21, the upper end of which connects with an organ-pipe 22. As shown, the valve 19 is normally held in its closed position by a spring 23.

31 designates an independent bank of keys from the rear end of each of which depends a rod 32, acting upon a double valve 33, which passes through a port 34 in the wall of a pressure-chamber 35. A lateral passage 36 connects, by means of a tube 37, with a passage 38 in a valve-chest 39, the passage 38 terminating in a recess 40, closed by a diaphragm 41, connected by a stem 42 to a puppet-valve 43, which controls the admission of air under pressure or atmospheric air through a passage 44 to a diaphragm 45. This diaphragm is connected with a lever 46, mounted in a chamber 47, into which pressure or atmosphere are admitted at will, as usual. Lever 46 is pivoted at 48 and carries at its free end a valve 49, closing a lateral passage 50, which opens into the passage 21, leading to the pipe 22.

It will be understood that the pressure-chambers 5, 35, 9, and 39 are common to all the notes of the instrument of the same bank and that each of the keys in the bank 1 has its individual valve 3, connection 7, valve 12, passage 14, diaphragm 15, lever 16, &c., which parts are duplicated in connection with the keys of the bank 31. Also the chambers 17 and 47 are each common to a series of pipes, as is usual. It will also be noted that the lateral ports 20 and 50 are opposite each other.

Each of the valves 19 and 49 is provided with an eye 51, which eyes are connected by a flexible cord 52 or its equivalent.

The operation of the device is as follows: In the position of rest the key—for example, key 1—is raised, and the valve 3 admits pressure from the chamber 5, through the tube 7, to the recess 10 above the diaphragm 11. The pressure being equal on the two sides of the diaphragm 11, the double valve 13 is in its lower position, admitting pressure through the passage 14 to the diaphragm 15. Whether there is pressure or atmosphere in the chamber 17, the valve 19 will be held closed by the spring 23. When the key is depressed, it results in opening the space beneath the diaphragm 15 to the atmosphere. This action is illustrated in connection with the key 31, which is shown depressed, thereby connecting the tube 37 to the atmosphere, causing the valves 43 to be raised and the atmosphere admitted to the duct 44 whereupon if there be pressure in the chamber 47 the diaphragm

45 will be forced to the left, actuating the lever 46 to open the valve 49 and admit pressure to the passage 21 and pipe 22. If, on the other hand, there be no pressure in the chamber 47, the lever 46 will of course remain inoperative. Whenever one of the valves—as, for example, 49— is open, it draws on the cord 52 and insures the opposing valve 19 remaining seated, preventing it from opening and from fluttering under the pressure admitted from the chamber 47 to the passage 21. It will be seen that this flexible cord 52 does not prevent the alternative opening of each of the valves 19 or 49, but is so constructed and fitted that the opening of one valve operates to hold the other in its closed position.

It is obvious that certain mechanical changes may be made in my device without departing from the spirit of the invention.

It is also obvious that there may be any desired number of sets of pipes 22 such as are well known in organs of this description and that each set of pipes is provided with two pressure-chambers 17 and 47 and with the complete valve equipment for each pipe, as already described.

What I claim is—

1. In a musical instrument, a sounding device, two valves for controlling said device, independent means for opening each of said valves, and a connection between said valves whereby the opening of one valve operates to hold the other in its closed position.

2. In a musical instrument, a sounding device, two oppositely-disposed normally closed valves for controlling said device, independent means for opening each of said valves, and a flexible connection between said valves whereby the opening of one valve operates to hold the other in its closed position.

3. In a musical instrument, a sounding device, two air-chambers, an air-passage leading from said sounding device to both said chambers, two oppositely-disposed normally closed valves, one for cutting off said sounding device from each of said chambers, independent means for opening each of said valves, and a connection between said valves whereby the opening of one valve operates to hold the other in its closed position.

4. In a musical instrument, a sounding device, two air-chambers, an air-passage leading from said sounding device to both said chambers, two oppositely-disposed normally closed valves, one for cutting off said sounding device from each of said chambers, and a flexible connection between said valves whereby the opening of one valve operates to hold the other in its closed position.

5. In a musical instrument, a sounding device, two air-chambers, an air-passage leading from said sounding device and having oppositely-disposed lateral openings, one into each of said chambers, a diaphragm forming part of the wall of each of said chambers, a lever in each of said chambers carrying a valve for closing an opening in said passage and operatively connected to the diaphragm in said chamber, and independent means for actuating said diaphragms for opening said valves.

6. In a musical instrument, a sounding device, two air-chambers, an air-passage leading from said sounding device and having oppositely-disposed lateral openings, one into each of said chambers, a diaphragm forming part of the wall of each of said chambers, a lever in each of said chambers carrying a valve for closing an opening in said passage and operatively connected to the diaphragm in said chamber, independent means for actuating said diaphragms for opening said valves, and a flexible connection between said valves whereby the opening of one valve operates to hold the other in its closed position.

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

AUGUST W. FLEGEL.

Witnesses:

OLIN A. FOSTER,

HAROLD BINNEY.