(No Model.) 2 Sheets—Sheet 1.

J. BINNIG.

ORGAN.

No. 516,181. Patented Mar. 13, 1894.

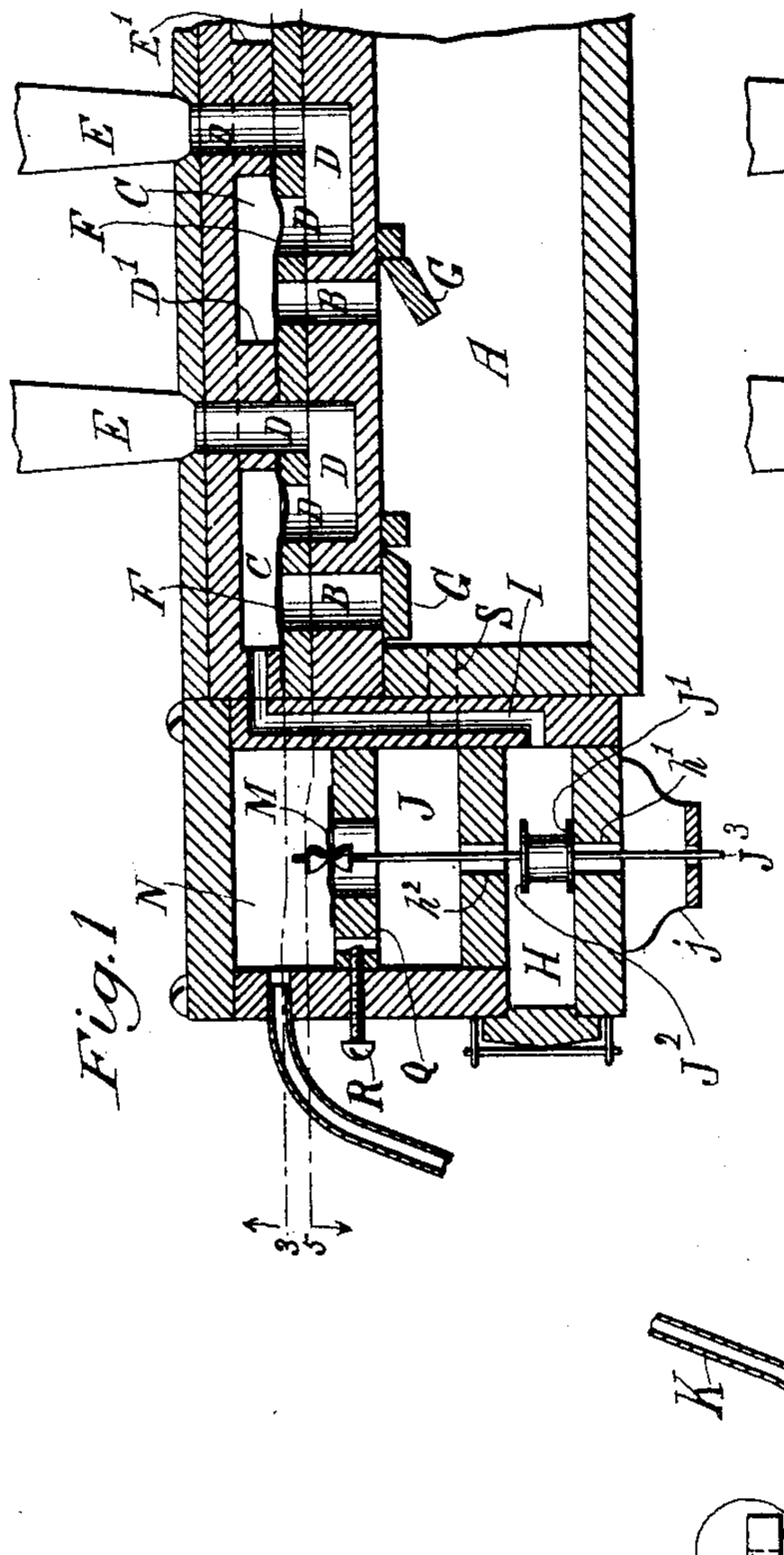


Fig. 1.

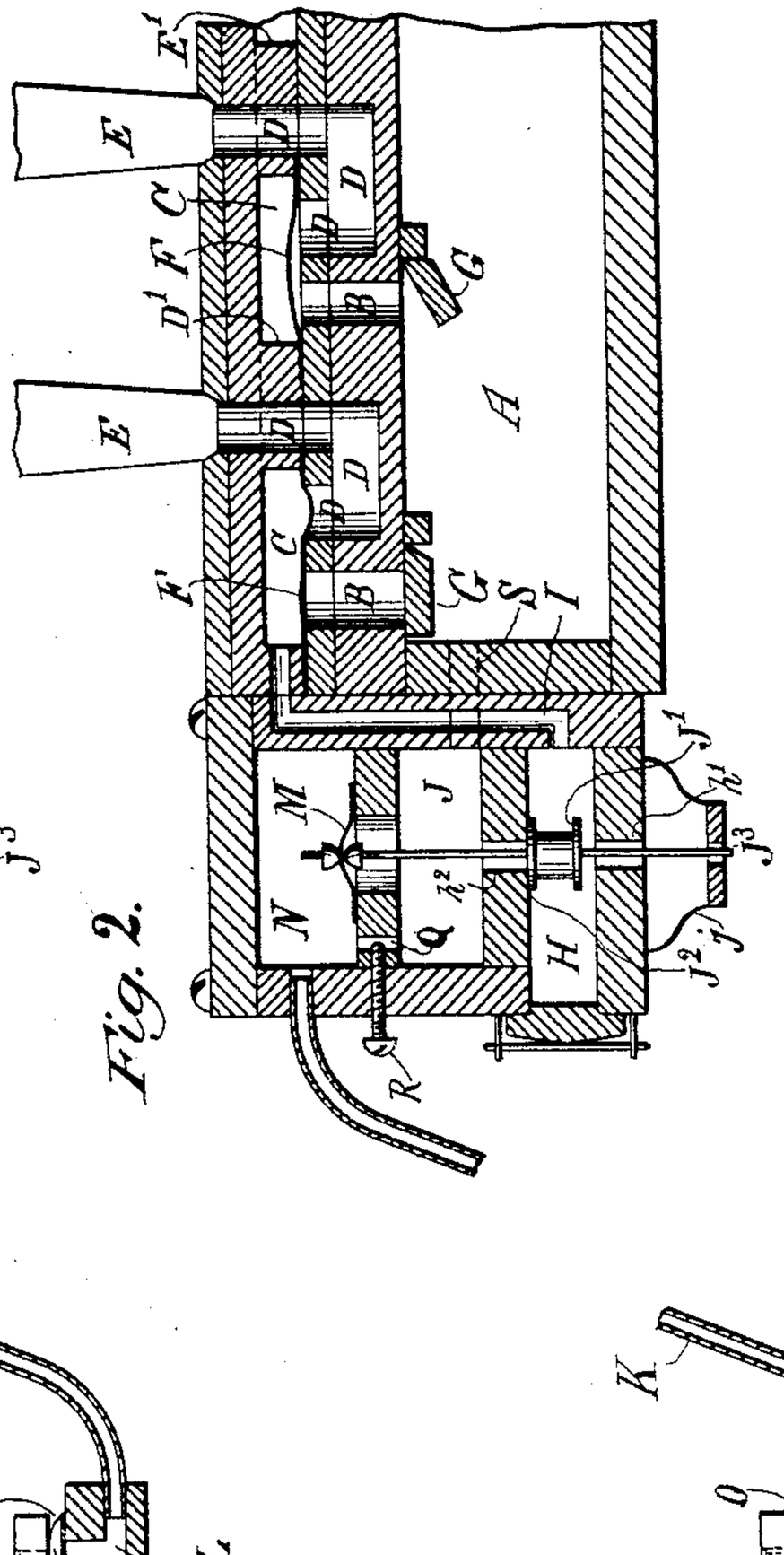
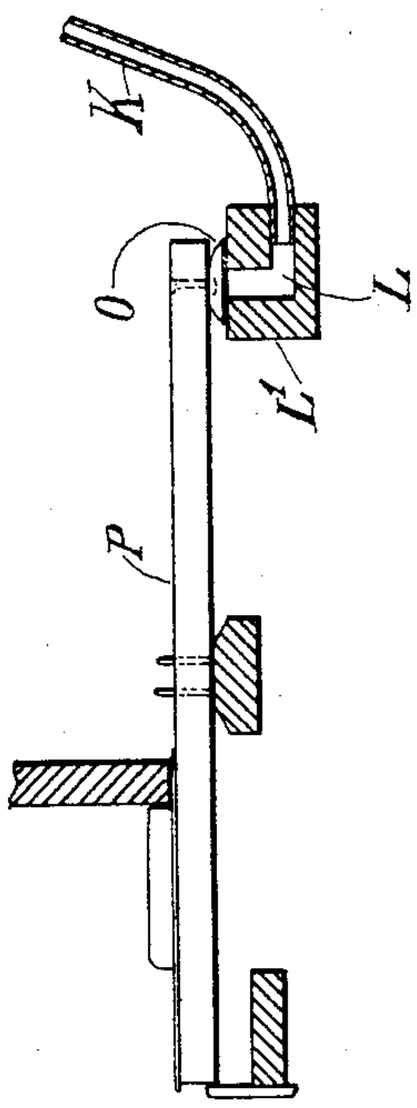
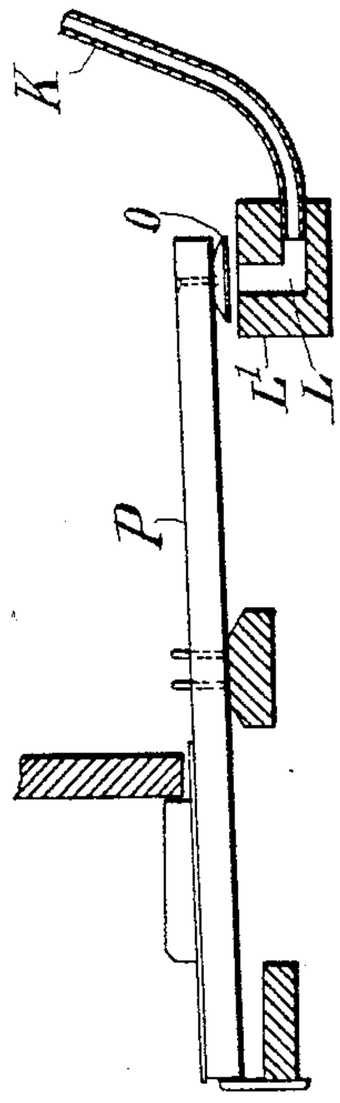


Fig. 2.





Witnesses:-
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By his attorney
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WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

J. BINNIG.

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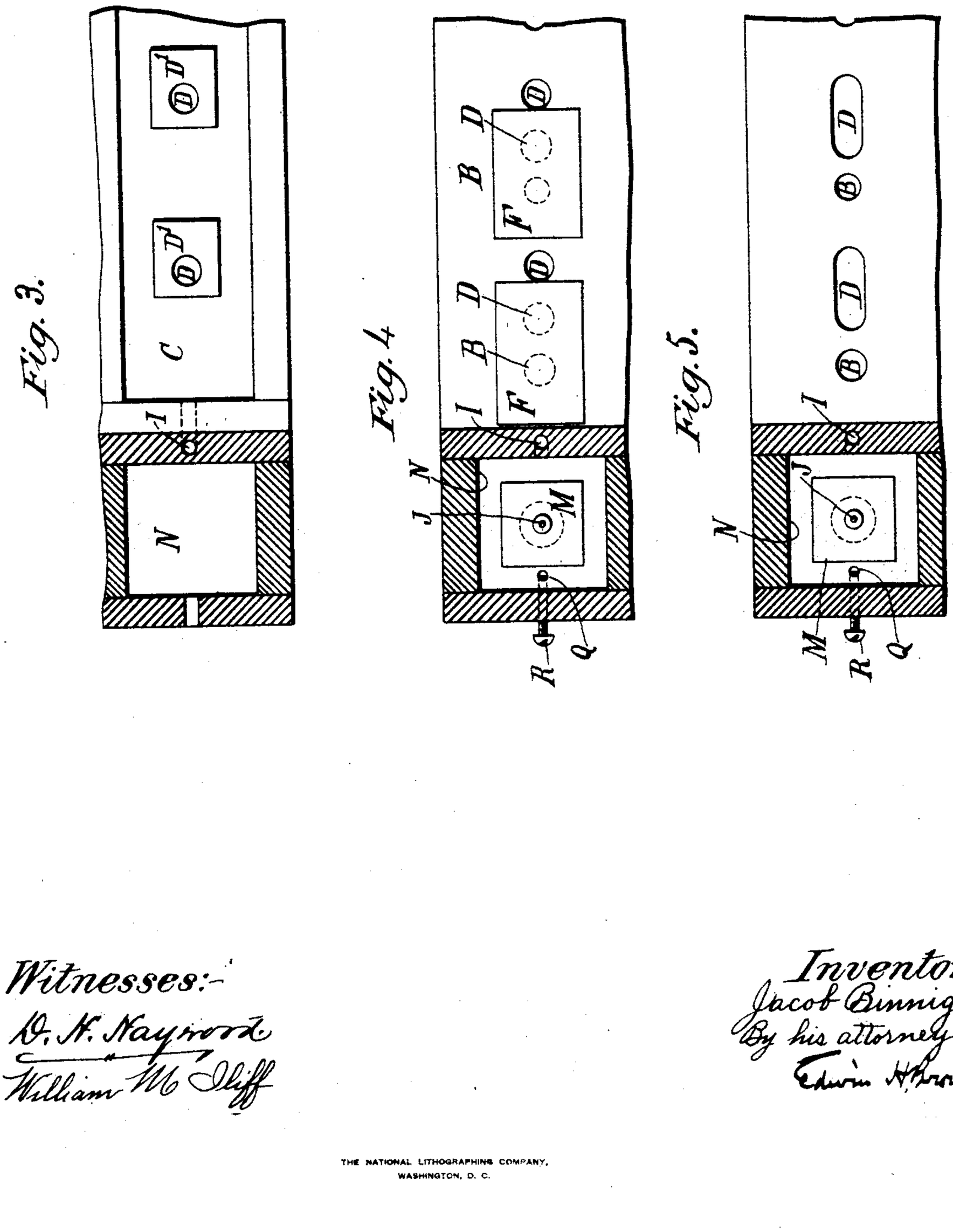

Witnesses:-
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By his attorney
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THE NATIONAL LITHOGRAPHING COMPANY,
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UNITED STATES PATENT OFFICE.

JACOB BINNIG, OF HOBOKEN, NEW JERSEY, ASSIGNOR TO THE AEOLIAN ORGAN AND MUSIC COMPANY, OF NEW YORK, N. Y.

ORGAN.

SPECIFICATION forming part of Letters Patent No. 516,181, dated March 13, 1894.

Application filed May 10, 1893. Serial No. 473,633. (No model.)

To all whom it may concern:

Be it known that I, JACOB BINNIG, of Hoboken, Hudson county, and State of New Jersey, have invented a certain new and useful Improvement in Organs, of which the following is a specification.

I will describe, as far as may be necessary to an understanding of my improvement, an organ which embodies the same, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a vertical section of parts of an organ embodying my improvement. Fig. 2 is a similar view that shows simply the parts in different positions. Fig. 3 is a horizontal section taken at the plane of the dotted line 3, Fig. 1, looking upward as indicated by the arrow at the end of this line. Fig. 4 is a horizontal section on the same plane showing the parts beneath the plane of the dotted line 3 Fig. 1. Fig. 5 is a horizontal section, taken at the plane of the dotted line 5, Fig. 1, looking downward.

Similar letters of reference designate corresponding parts in all the figures.

A designates a wind chest. By this term I mean to include what is ordinarily meant by this term, namely, a chamber or chest communicating with either force or suction bellows. In the present instance, the wind chest is intended to be used with force bellows.

B designates ducts or ports leading from the wind chest. As shown, they pass through the top of the wind chest. Above them is a valve recess, C. By this term, I mean to include any chamber or recess or space affording opportunity for the movement of a valve. The ducts B extend from the wind chest into the valve recess C.

D designates ducts or ports extending from the valve recess C to sound producing devices E. There is one duct B and one duct or port D for each sound producing device E. The valve recess C may be common to both sets of ducts and is intended so to be in the organ which I have chosen to illustrate my improvement. Because of this, the ducts D are partly formed in blocks E′, which extend from the top and bottom of the valve recess C.

F designates valves, shown as consisting of a flexible diaphragm made of any suitable material such as sheepskin, and attached at their edges in any suitable manner to the top of the wind chest A, above the adjacent ends of the ports B D. Preferably they will be secured to the top of the wind chest all around their edges. When these valves are raised, communication will be established between the ports B and the ports D. Consequently, air may then pass from the ports B through the ports D to the sound producing device.

There may be any number of sound producing devices E and ducts B and D for one valve recess C. All such sound producing devices will operate in unison, except as their action may be modified by mutes, actuated by stop handles such as are ordinarily comprised in organs. I have shown such mutes made in the form of hinged valves G located below the ducts B and capable of being raised to cut off communication between those ducts and the wind chest or lowered to permit air to pass from the wind chest to these ducts.

With the valve recess C communicates a valve chamber H. In the present instance, communication between these two ports is established by means of a port, I, extending between them. In the bottom of the chamber H is an opening h' for establishing communication between the interior of the chamber and the outside atmosphere. In the top of the chamber is an opening h^2 affording communication between the valve chamber and a chamber J that communicates with the wind chest. This chamber J may, for convenience, be termed an intermediate chamber. This chamber J is always in communication with the wind chest A, owing to the existence of a port S which extends between the two.

In the valve chamber are two valves J′ J^2. In the present instance, both are made parts of one structure which is provided with a rod J that extends through the opening h' h^2. The lower end of this rod is passed through a guide plate j and the upper end is fastened by screw nuts or otherwise to a flexible diaphragm M, constituting or forming part of a motor which is intended to raise and lower the valves and is combined with a motor chamber N. By the term motor chamber, I mean to include anything which forms part

of or renders possible the operation of a motor. The valve J′ controls the opening h'. The valve J^2 controls the opening h^2. When the valves are lowered, communication between the valve chamber and the atmosphere is cut off, and this is equivalent to saying that communication is established between the valve recess C and the intermediate chamber J. Below the motor diaphragm M is a large opening in the top of the intermediate chamber J. Consequently, whenever the pressure in the intermediate chamber J is varied, motion will be imparted to the motor diaphragm.

The motor chamber N has provision for communicating with the atmosphere under control of a suitable valve. In the present instance, the motor chamber communicates through a pipe K with a duct or port L in a rail L′. This port communicates with the atmosphere under the control of the valve O. While this valve may be of any suitable kind and operated in any desired manner, it is represented in the present instance as being operated by an ordinary manual key, P. A perforated music sheet would be one well known equivalent of a number of valves O and key levers P.

Of course it will be understood that what I have said about the possibility of using one valve recess C for a number of sound producing devices applies only to sound producing devices for a single note. It must also be clearly understood that for each note there will be a separate and independent set of chambers H, J, N with their appurtenances, as also a separate port or duct L for each motor chamber N.

Between the motor chamber N and the intermediate chamber J, communication is established through an equalizing port or duct Q. To secure the desired operation of the parts, the proportioning of this port or duct is of great importance. A simple way of securing the proper proportion is to combine with the duct or port a screw R extending from outside the chambers and intersecting the port or duct transversely, for obviously a slight adjustment of the screw will enlarge or diminish the area of the port or duct.

In Fig. 1, I have shown the parts in their normal positions. It will be seen that at this time the valves F are closed, so that no air can pass from the wind chest to the sound producing devices. This will be so, even if the mutes G should be left open.

The reason that the valves F are closed is that communication between the motor chamber N and the atmosphere has been cut off by the closing of the duct or port L by the valve O, and that the lowering of the valves J′ J^2 will establish communication between the valve recess C and the motor chamber N. As the port S maintains communication between the intermediate chamber J and the wind chest, it results that when the valve O is closed to cut off communication between the lower chamber and the atmosphere, there is a balance or equalization of pressure above and below the valves C. When the valve O is opened, the pressure in the motor chamber N is reduced and consequently the motor M raises the valves, thus cutting off communication between the valve recess C and the wind chest and establishing communication between the valve recess C and the atmosphere.

The duct or port Q of course allows air to leak from the intermediate chamber J into the motor chamber N but not rapidly enough to equalize pressure, but when the valve O is closed the port or duct Q quickly equalizes the pressure so as to cause the motor to lower the valves J′ J^2.

It will be seen that in this illustration of my invention A is what is ordinarily termed a wind chest; that B is a duct or port leading from the wind chest; that E is a sound producing device; that D is a duct or port communicating with the sound producing device; that F is a valve consisting of a flexible diaphragm controlling communication between the wind chest and the sound producing device; that C is a valve recess into which the said valve F may move; that H is a valve chamber communicating with the valve recess C, in the present instance, through a port I; that J′ is a valve located in the valve chamber and controlling communication between the atmosphere and the valve recess C; that J is a chamber communicating with the wind chest; that J^2 is a valve controlling the passage of air between the chamber J communicating with the wind chest and the said valve chamber H; that N is a motor chamber communicating with the chamber J that communicates with the wind chest; that O is a valve controlling the passage of air between the motor chamber and the atmosphere; that Q is an equalizing port or duct; that R is a regulator for the equalizing duct; and that M is a motor for operating the valves.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In an organ, the combination of a wind chest, a port leading from the wind chest, a sound-producing device, a port communicating with the sound producing device, a valve controlling communication between the wind chest and the sound producing device, a valve recess into which said valve may move, a valve chamber communicating with the said valve recess and having an opening leading to the atmosphere, a valve controlling communication between said valve recess and the atmosphere, a chamber communicating with the wind chest, a valve controlling the passage of air between said chamber which communicates with the wind chest and the said valve chamber, a motor chamber communicating with the chamber that communicates with the wind chest, a valve controlling the passage of air between the motor chamber and the atmosphere, and a motor for operating the

valves in said valve chamber, substantially as specified.

2. In an organ, the combination of a wind chest, a port leading from the wind chest, a sound producing device, a port communicating with the sound producing device, a valve, consisting of a flexible diaphragm, controlling communication between the wind chest and the sound producing device, a valve recess into which said valve may move, a valve chamber communicating with the said valve recess and having an opening leading to the atmosphere, a valve controlling communication between said valve recess and the atmosphere, a chamber communicating with the wind chest, a valve controlling the passage of air between said chamber which communicates with the wind chest and the said valve chamber, a motor chamber communicating with the chamber that communicates with the wind chest, a valve controlling the passage of air between the motor chamber and the atmosphere, and a motor for operating the valves in said valve chamber, substantially as specified.

3. In an organ, the combination of a wind chest, a port leading from the wind chest, a sound producing device, a port communicating with the sound producing device, a valve controlling communication between the wind chest and the sound producing device, a valve recess into which said valve may move, a valve chamber communicating with the said valve recess and having an opening leading to the atmosphere, a valve controlling communication between said valve recess and the atmosphere, a chamber communicating with the wind chest, a valve controlling the passage of air between said chamber which communicates with the wind chest and the said valve chamber, a motor chamber communicating with the chamber that communicates with the wind chest, a valve controlling the passage of air between the motor chamber and the atmosphere, an equalizing port or duct between the chamber that communicates with the wind chest and the motor chamber, a regulator for this equalizing duct and a motor for operating the valves in said valve chamber, substantially as specified.

4. In an organ, the combination of a wind chest, a port leading from the wind chest, a sound producing device, a port communicating with the sound producing device, a valve controlling communication between the wind chest and the sound producing device, a valve recess into which said valve may move, a valve chamber communicating with the said valve recess and having an opening leading to the atmosphere, a valve controlling communication between said valve recess and the atmosphere, a chamber communicating with the wind chest, a valve controlling the passage of air between said chamber which communicates with the wind chest and the said valve chamber, a motor chamber communicating with the chamber that communicates with the wind chest, a valve controlling the passage of air between the motor chamber and the atmosphere, an equalizing port or duct between the chamber that communicates with the wind chest and the motor chamber, a regulator consisting of a screw having its end projected transversely into the equalizing duct, and a motor for operating the valves in said valve chamber, substantially as specified.

5. In an organ, the combination of a wind chest, a port leading from the wind chest, a sound producing device, a port communicating with the sound producing device, a valve controlling communication between the wind chest and the sound producing device, a valve recess into which said valve may move, a valve chamber having an opening leading to the atmosphere, a port establishing communication between said valve chamber and said valve recess, a valve controlling communication between said valve recess and the atmosphere, a chamber communicating with the wind chest and extending across the valve chamber, a valve controlling the passage of air between said chamber which communicates with the wind chest and the said valve chamber, a motor chamber extending across the said chamber which communicates with the wind chest, a port establishing communication between the motor chamber and the said chamber that communicates with the wind chest, and a valve controlling the passage of air between the motor chamber and the atmosphere, substantially as specified.

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

JACOB BINNIG.

Witnesses:
JAMES MORGAN,
EDWIN H. BROWN.