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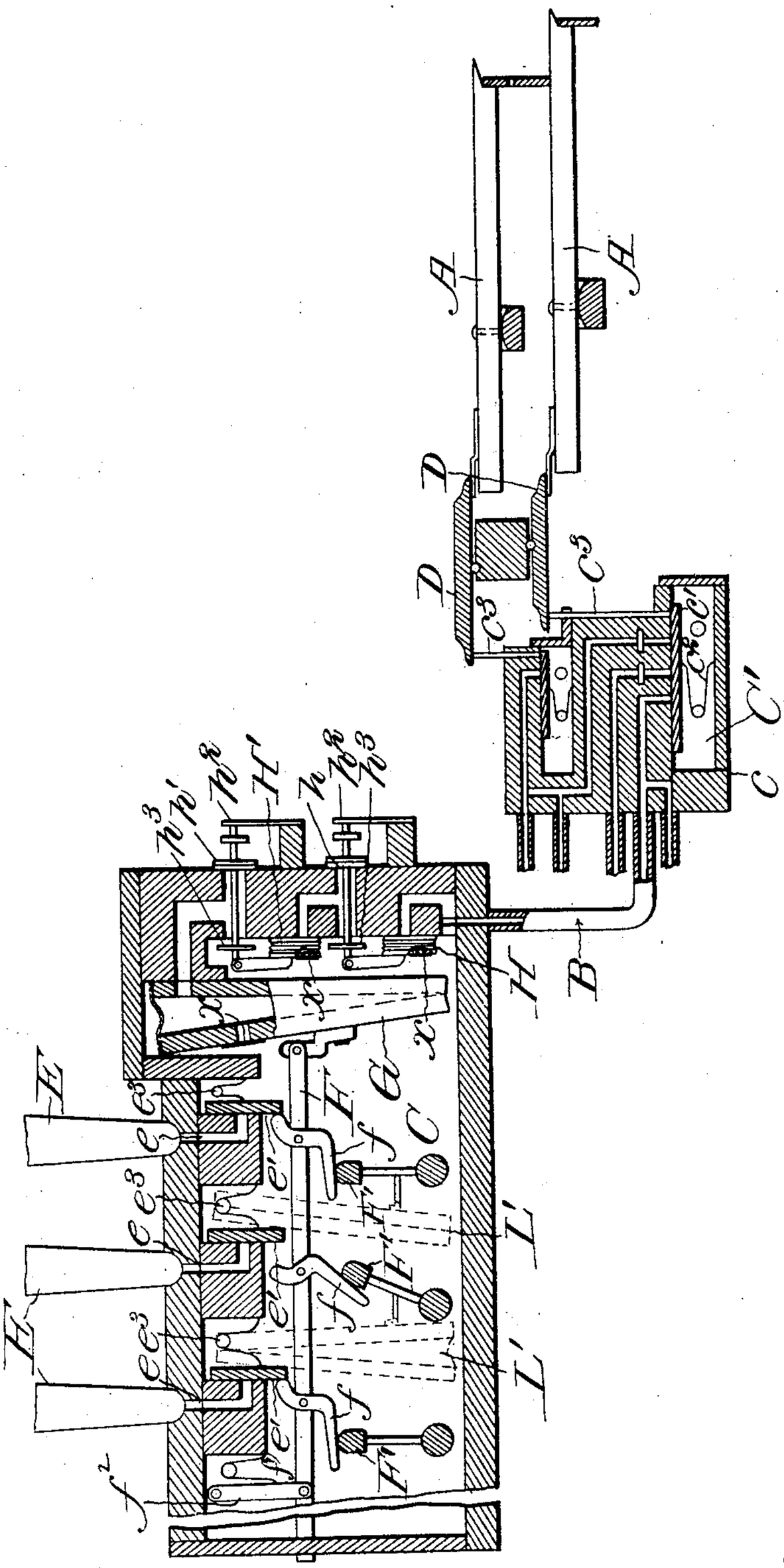
H. F. HAMMER.

PIPE ORGAN.

APPLICATION FILED FEB. 27, 1902. RENEWED DEC. 14, 1903.

NO MODEL.



Witnesses

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No. 752,671. Patented February 23, 1904.

UNITED STATES PATENT OFFICE.

HENRY F. HAMMER, OF DETROIT, MICHIGAN.

PIPE-ORGAN.

SPECIFICATION forming part of Letters Patent No. 752,671, dated February 23, 1904.

Application filed February 27, 1902. Renewed December 14, 1903. Serial No. 185,169. (No model.)

To all whom it may concern:

Be it known that I, HENRY F. HAMMER, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Pipe-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 pertains to make and use the same, reference being had to the accompanying drawing, which forms a part of this specification.

My invention relates to improvements in pneumatic pipe-organs; and it consists in the improved means for operating the valves of the pipes, whereby a quicker action is secured than is possible in the present construction.

My invention is shown in the accompanying drawing, in which the figure is a vertical sectional view of a part of a set of pipes with the wind-chest, keyboard, and connecting part.

In the drawing, A′ and A² represent an upper and lower key of two different sets.

B represents an air-conductor leading from the wind-chest C into the chest-body *c*. This conductor is stopped off by the valve *c′*, which is held normally closed against the air-pressure from the wind-chest by the spring c^2.

D represents a lever connected to a key at one end and to the valve *c′* at the other and through the rod c^3, the construction being such that the depression of the key opens the valve *c′* and permits compressed air in the pipe B to exhaust into the chest C′.

E E represent the regular pipes of the organ standing up from the wind-chest C, with which they are connected through passages *e*.

e′ e′ represent valves normally closing the passages *e*, the valves being held closed by the springs e^3.

F represents a reciprocating bar, on which are loosely pivoted dogs *f*, the dogs being arranged to open the valves *e′ e′* as the bar F reciprocates when the dogs are held up by the rock-arms F′. If the dogs are swinging loose, the movement of the bar does not affect the valve.

The bar F is normally held to the rear end of its movement by the spring f^2, which acts against the link *f″*, with which the bar is engaged. The forward end of the bar is pivoted to the large pneumatic G, which is held normally open by the bar being drawn rearwardly by the spring *f′*. As the pressure of the air in the wind-chest tends to close the pneumatic G, this pneumatic remains open only when the air-pressure inside of it is equal to that on the outside, as is common in this construction. The air-pressure is therefore maintained in an equal degree inside and outside of the pneumatic, except when the bar is to be drawn forward to open the valves, which is accomplished by exhausting the air in the pneumatic.

The air in the pneumatic G is exhausted by means of the valve *c′* and the pneumatics H H′ and the valves *h h′*. The valves *h h′* are held closed by the aid of the springs h^2 and the air-pressure within the pneumatics H and H′, with which the valves are connected, the springs being so balanced that if the air-pressure in the pneumatics be exhausted the spring will give way to the pressure back of it, allowing the air to exhaust. Thus if the valve *c′* be open, the air in the pneumatic H will exhaust, allowing the valve *h* to open, which in turn allows the air in the pneumatic H′ to exhaust, which in its turn opens the valve *h′* and allows the air in the large pneumatic G to exhaust in the atmosphere.

h^3 h^3 represent valves that close the outlet from the wind-chest when the air in the pneumatics is being exhausted.

It will be seen that I have combined the wind-chest and the pneumatic system for operating the main valves of the pipes in an improved and compact form, which forms a part of my invention. One of the main features of my invention, however, is a vacuum exhaust, which I employ to quicken the action by accelerating the air through the connecting-pipe B. In constructing organs it becomes necessary to make these connecting-pipes B, in some cases, of great length and the friction of the air in the tube in such cases becomes so great that the pressure from the air in the wind-chest alone moves the air from

the conductor so slowly as to make the action of the organ slow and unsatisfactory, some interval elapsing between the touching of the key and the speaking of the pipe. To accomplish the result sought, I connect the exhaust-chests C′ with an exhaust-bellows in a suitable manner, so that the vacuum is maintained in the chest C′, which causes the air in the conductor B to move more quickly into the chest when the valve *c′* is open than would be the case if atmospheric pressure were maintained in the chest. I am aware that a vacuum-chest has been employed in connection with organs of this class, such as in the patent to Schoenstein, No. 510,521, wherein the operating pneumatic is first opened by air-pressure and then closed by a vacuum-exhaust, presumably to close the valve quickly; but in my construction the valve is closed by a spring in the usual manner, and I am not aware that a vacuum-exhaust is used to open the valve quickly.

I find in practice that I am able to secure a quicker action without regard to the length of the conductor-pipe that may be employed.

X indicates small bleeders in the pneumatics to maintain an equilibrium of pressure.

What I claim is—

1. In an organ-action, the combination with a wind-chest, of motor and primary pneumatics under pressure therein, a pressure from the motor-pneumatic having an exhaust-opening to the atmosphere and an inlet-opening from the wind-chest, valves for said openings controlled by the primary pneumatic and tending to open the exhaust with the wind-chest pressure, and a key-operated rarefied exhaust from the primary pneumatic.

2. In an organ, the combination with a wind-chest, the organ-pipes, the valves in the chest controlling the admission of air to said pipes, the motor-pneumatics in the chest and means to operate the same, of the longitudinally-reciprocating bars connected to and operated by the pneumatics, the dogs pivoted to the bars and settable to engage and open the valves, and means for setting the dogs.

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

HENRY F. HAMMER.

Witnesses:
JESSIE A. GORDON,
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