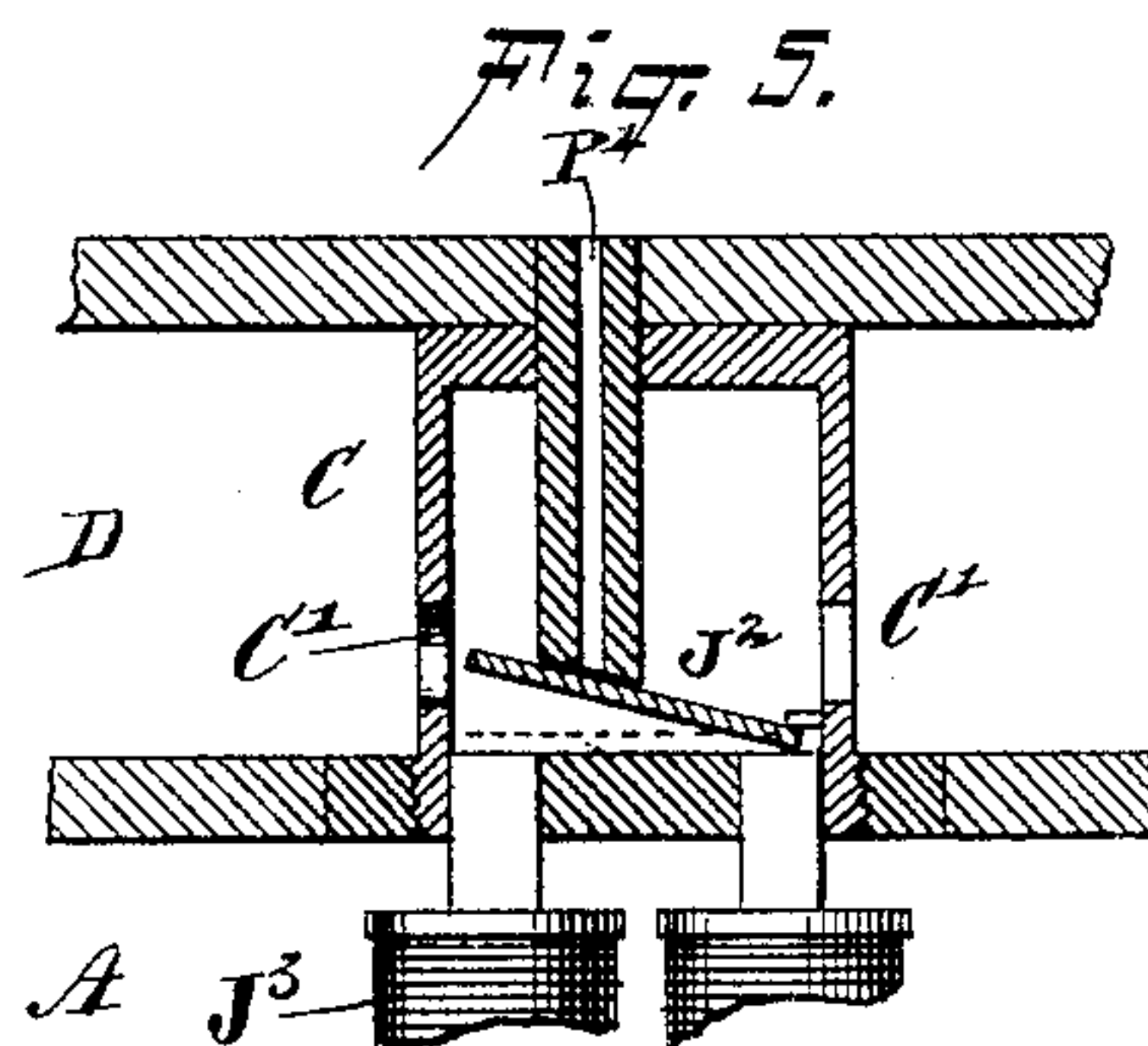
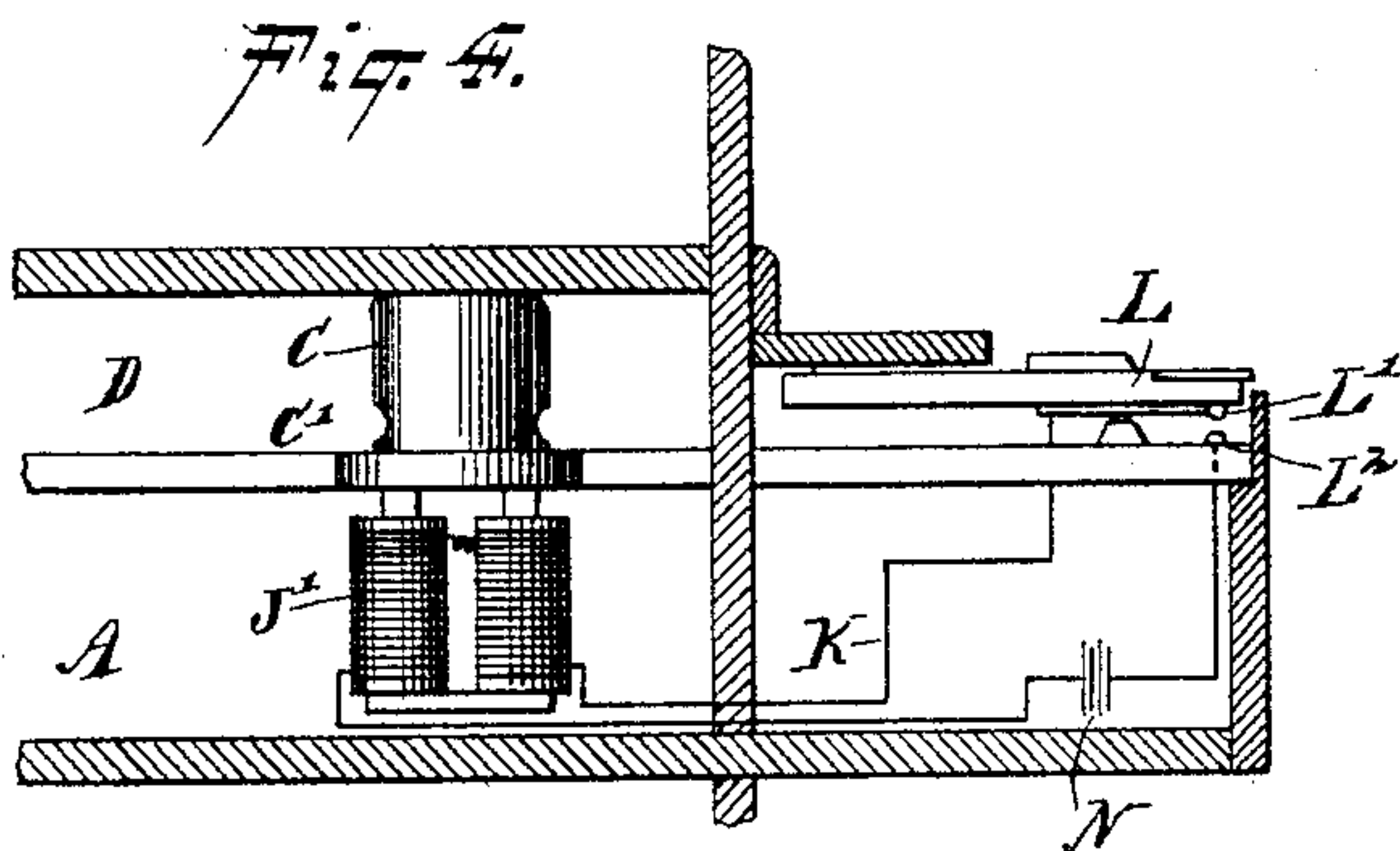
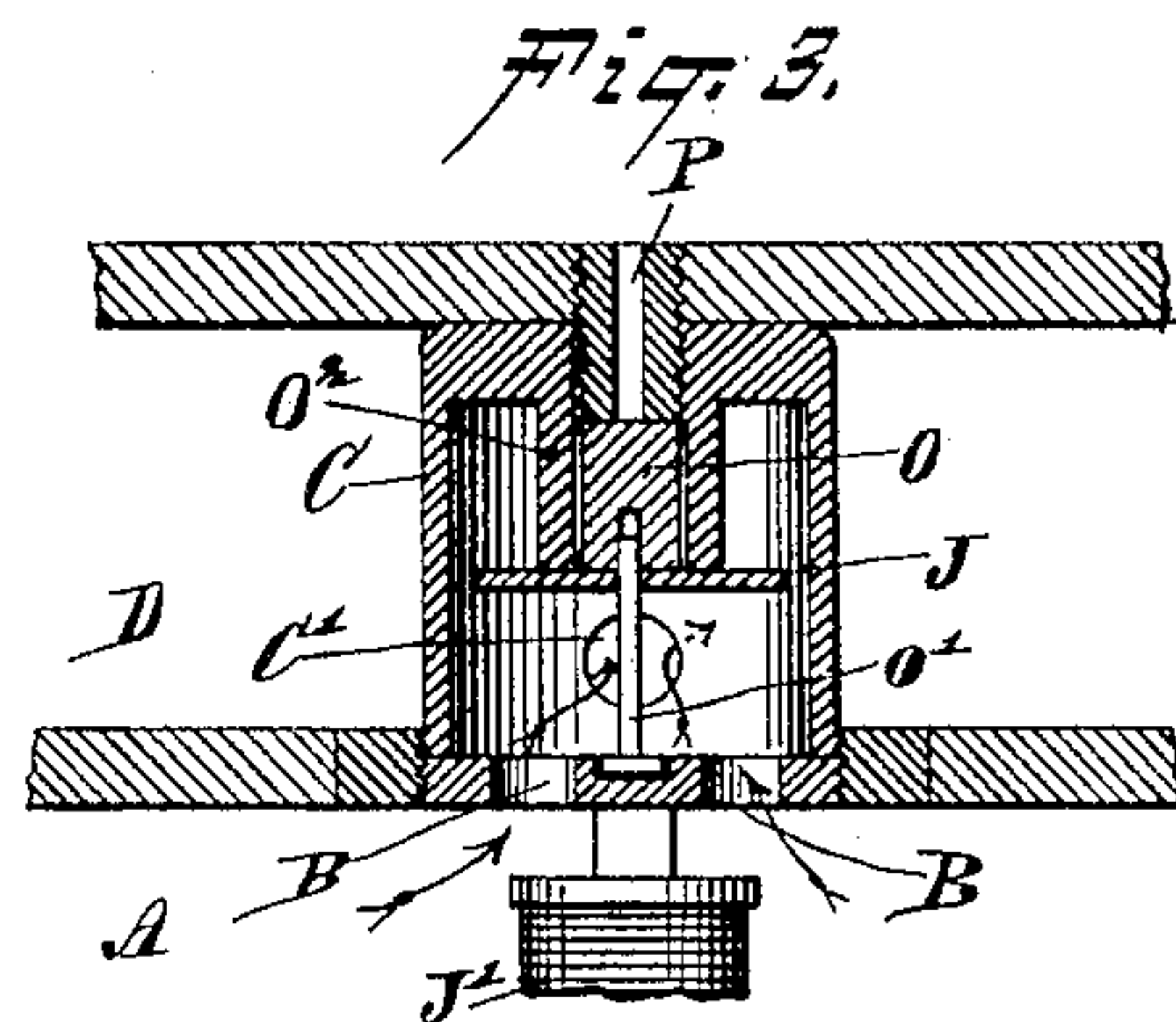
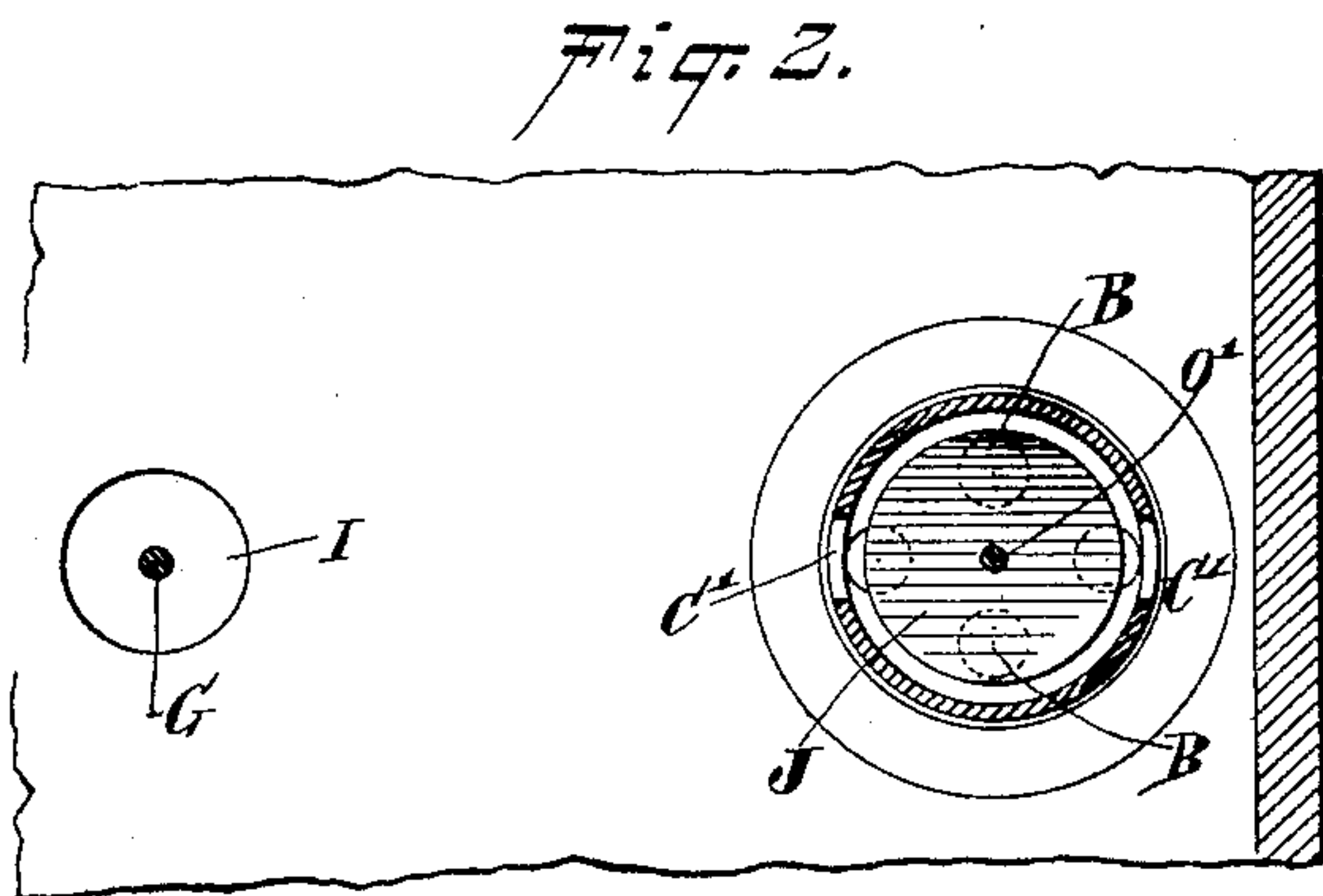
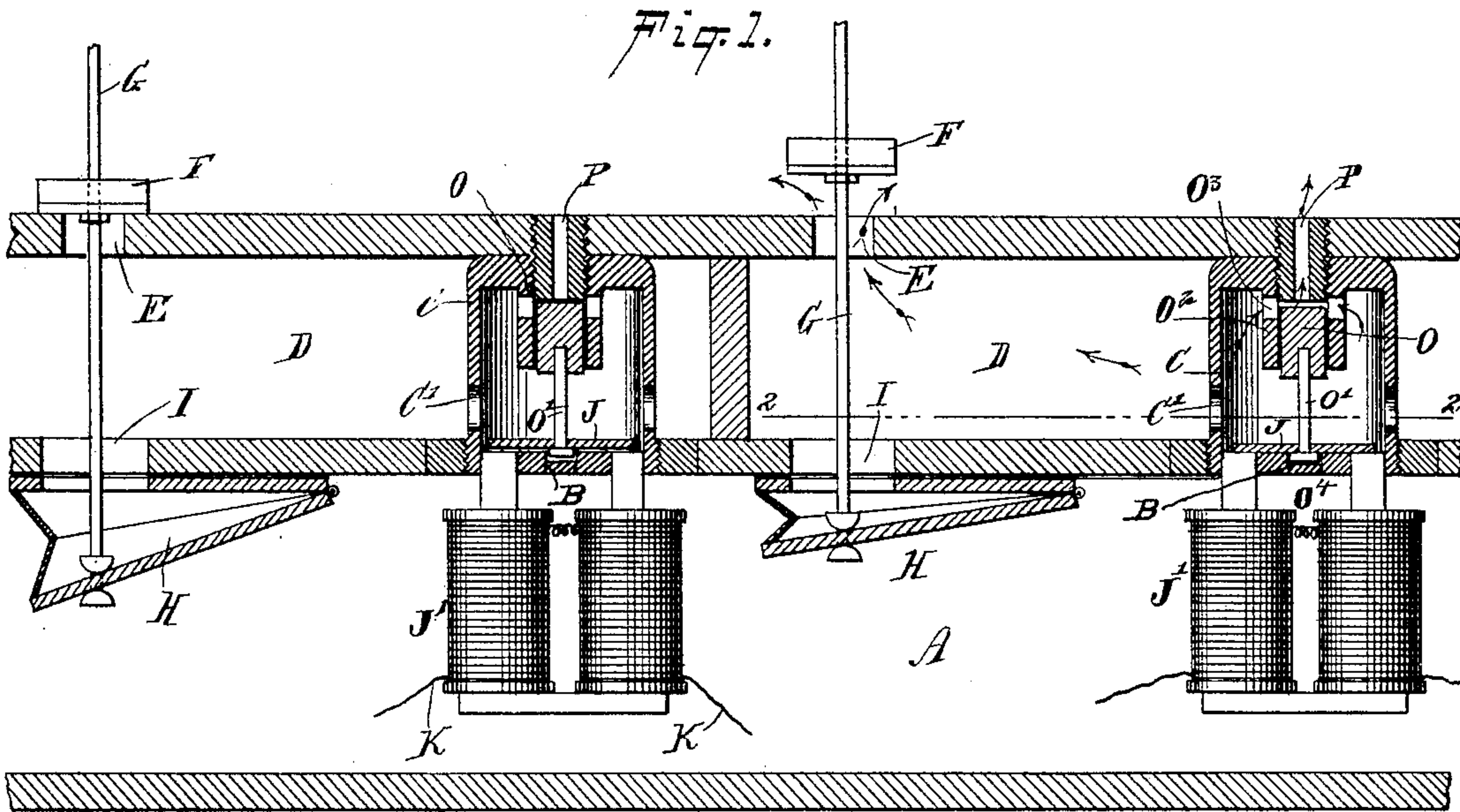


(No Model.)

H. E. HOBBS.
ELECTROPNEUMATIC ORGAN ACTION.

No. 582,918.

Patented May 18, 1897.



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HERMANN ELLIS HOBBS, OF WESTON, MASSACHUSETTS.

ELECTROPNEUMATIC ORGAN-ACTION.

SPECIFICATION forming part of Letters Patent No. 582,918, dated May 18, 1897.

Application filed May 21, 1896. Serial No. 592,387. (No model.)

To all whom it may concern:

Be it known that I, HERMANN ELLIS HOBBS, of Weston, in the county of Middlesex and State of Massachusetts, have invented a new and Improved Electropneumatic Action for Organs, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved electropneumatic action, more especially designed for use on electric organs and arranged to permit the employment of a comparatively weak current to indirectly control the exhaust-valve.

The invention consists of certain parts and details and combinations of the same, as will be fully described hereinafter and then pointed out in the claims.

Reference is also to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a sectional plan view of part of the same on the line 2 2 of Fig. 1. Fig. 3 is a transverse section of the valve controlling the inlet of the air from the wind-chest to the exhaust-chamber. Fig. 4 is a reduced sectional side elevation of the improvement, and Fig. 5 is a sectional side elevation of a modified form of the improvement.

The wind-chest A, of any approved construction, is connected by ports B with a casing C, having ports C' opening into the chamber D, having an outlet-opening E, adapted to be closed by an exhaust-valve F, secured on the valve-stem G, controlling the valve admitting air to the organ-pipes to sound the same, as hereinafter more fully described.

The valve-stem G is connected with a pneumatic H, interposed between the wind-chest A and the chamber D, the latter being in communication with the interior of the pneumatic and the wind-chest A, so that the air-pressure in the chamber D acts on the inner surface of the pneumatic and the air contained in the wind-chest acts on the outer surface of the pneumatic.

The ports B are adapted to be closed by a valve J, which forms the armature for an electromagnet J', having its circuit-wire K

connected with the key L of the organ, the said key being provided with a contact-point L', adapted to contact with a point L² on pressing the key L to sound the corresponding reed or organ pipe. In the circuit-wire K is arranged a battery N, as indicated in Fig. 4.

The valve J is fitted to slide loosely on a valve-stem O', projecting downwardly from a valve O, controlling a leak-passage P, designed to permit air to leak out of the chamber D whenever the valve O is in an open position, as indicated at the right in Fig. 1.

The valve O is preferably mounted to slide in a suitable casing O², forming an integral part of the casing C, and this casing O² is provided with openings O³ to permit the air to pass from the chamber D through the said openings to the leak-passage P whenever the valve O is in an open or a lowermost position.

The extreme lower end of the valve-stem O' is formed with a head O⁴, on which rests the valve J when in a lowermost position.

The operation is as follows: When the several parts are in the position as illustrated at the left in Fig. 1, with the leak-passage P closed by the valve O and the valve J lifted from its seat, opening the ports B and establishing communication between the wind-chest and the chamber D, then the pressure in the wind-chest A and the chamber D is equal, so that the pneumatic is open and the valve F, by its own weight, is seated over the exhaust-port E to close the latter. Now when it is desired to lift the valve-stem G to operate the auxiliary valve which controls the large pneumatic operating the main valve of the organ-pipe, so as to sound the same, then the operator presses the corresponding key L to close the circuit in the wire K to cause the electromagnet J' to attract the valve J, whereby the valve O is drawn downward to the position shown at the right hand in Fig. 1. The valve O, in moving to this position, opens the leak-passage P to permit some of the air in the chamber D to pass out by the way of the leak-passage P, and consequently the pressure in the chamber D is reduced somewhat relative to the pressure in the wind-chest A, as no air can pass from the wind-chest to the chamber D, owing to the seating of the valve J. Now when this reduction of pressure in the

chamber D occurs then the preponderance of pressure in the wind-chest A acts on the pneumatic H and closes the same to lift the valve F off its seat on the port E, and consequently the air escapes from the chamber D through the said port E to the outer air. As soon as the operator releases the key L the circuit is broken, and the air from the wind-chest A, in passing up the ports B, lifts the valve J to the position shown in Fig. 3, so that air can rush into the casing C and from the latter through the ports C' into the chamber D to fill the same and pneumatic H. The valve J in rising to the position shown in Fig. 3, besides allowing air to enter the chamber D, strikes the valve O and returns it to its seat, thus allowing of making the said valve O larger and heavier and thereby more easily drawn away again by the valve J. As the ports B are larger than ports E and leak-passage P combined, it is evident that the chamber D and pneumatic H will be filled with air at or very nearly the pressure of the air contained in the wind-chest A, thus allowing a spring or weight to close valve F and inflating and opening the pneumatic H. The pressure in the chamber D will finally be equal to that of the wind-chest A, and when this takes place the valve J will be held a short distance above the top of the ports B and the valve O will close the leak-passage P, so that no air can escape from the chamber D until the key L is again pressed and the above-described operation is repeated.

As illustrated in Fig. 5, the armature-valve J² not only controls the exhaust-ports B, but also controls directly the leak-passage P', the said valve being for this purpose hinged at one end, as plainly shown in the said figure. The operation is the same as above described—that is, the valve J² on being attracted by the electromagnet closes the ports B and opens the leak-passage P. The valve J² may be hinged or merely confined by a pin projecting from the inside of the casing, the plan being to keep the valve J² from being blown out of position in regard to the leak-passage P by the inrush of air at the moment of breaking circuit, and also to have one edge of the valve in contact with one pole of the magnet for increased magnetic strength.

Now it will be seen that by the arrangement described the exhaust-valve F is controlled indirectly by the electric current passing through the electromagnet, the armature of which forms the inlet-valve for the passage of the air from the wind-chest A to the chamber D. It will further be seen that by the arrangement described but a very weak current is necessary for holding the valve J to the electromagnet during the time air is desired to leak out of the passage P for obtaining a preponderance of pressure in the wind-chest A over the pressure in the chamber D to

permit the pneumatic to close, as above described.

The casing C and the magnets and valve-seat are preferably arranged on a common holder or ring (not shown) secured to the wind-chest to permit of convenient access to the said parts for repairs and other purposes.

It is evident that the magnets may be of any approved construction, with one or more coils, as may be desired, and I do not limit myself to the particular devices shown, as the same may be varied without deviating from my invention.

The action described is applicable to the stop-action of the organ by suitable arrangements of valves other than the ones used for the pipes. In fact, the entire organ may be operated by this device.

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

1. An electropneumatic action for organs, comprising a chamber having an exhaust-port and a leak-passage, an exhaust-valve over the said exhaust-port, a pneumatic in communication with the said chamber and surrounded by the air from the wind-chest, a valve-stem actuated from the said pneumatic and carrying the said exhaust-valve, and an electromagnet the armature of which forms a valve for controlling the inlet from the wind-chest to the said chamber, the said valve also controlling the said leak-passage, substantially as shown and described.

2. An electropneumatic action for organs, comprising a chamber having an exhaust-port and a leak-passage, an exhaust-valve over the said exhaust-port, a pneumatic in communication with the said chamber and surrounded by the air from the wind-chest, a valve-stem actuated from the said pneumatic and carrying the said exhaust-valve, an electromagnet the armature of which forms a valve for controlling the inlet from the wind-chest to the said chamber, and a second valve for controlling the said leak-passage and connected with the said armature-valve, substantially as shown and described.

3. An electropneumatic action for organs, comprising a wind-chest, a chamber connected by ports with the said wind-chest, an exhaust-valve for the said chamber, a pneumatic for controlling the said exhaust-valve, an electromagnet the armature of which forms a valve for controlling the said inlet-ports, the said valve also controlling a leak-passage leading from the said chamber, and a key adapted to open and close the circuit for the said electromagnets, substantially as shown and described.

HERMANN ELLIS HOBBS.

Witnesses:

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CLAYTON H. TAFT.