

(No Model.)

2 Sheets—Sheet 1.

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ELECTRIC ORGAN ACTION.

No. 374,088.

Patented Nov. 29, 1887.

Fig. 1.

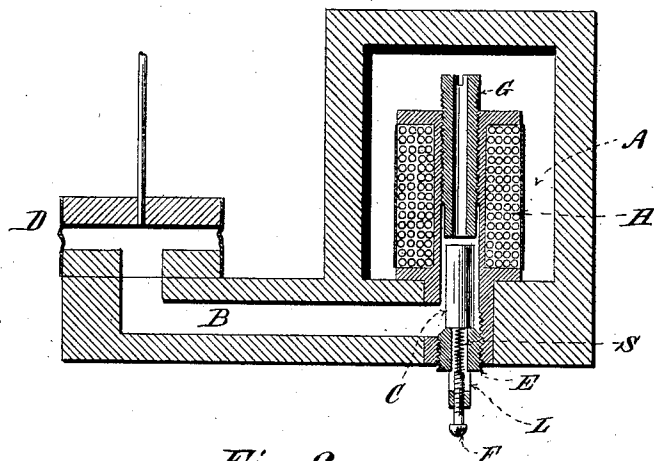
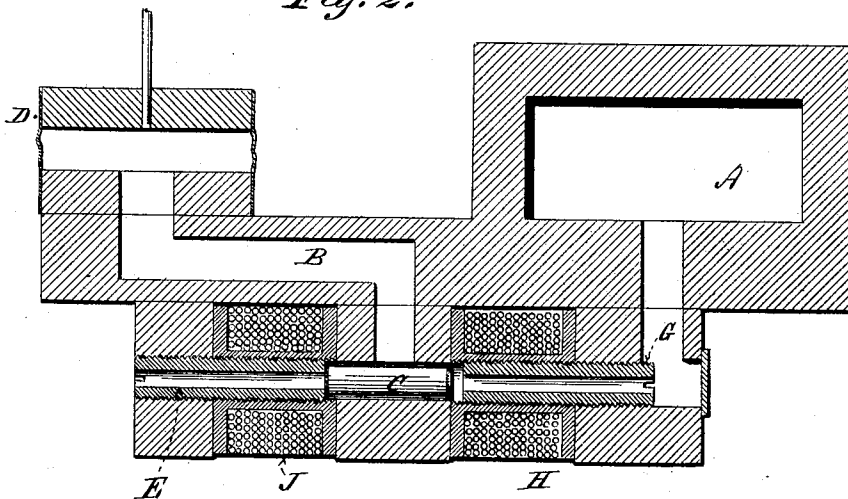


Fig. 2.



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(No Model.)

2 Sheets—Sheet 2.

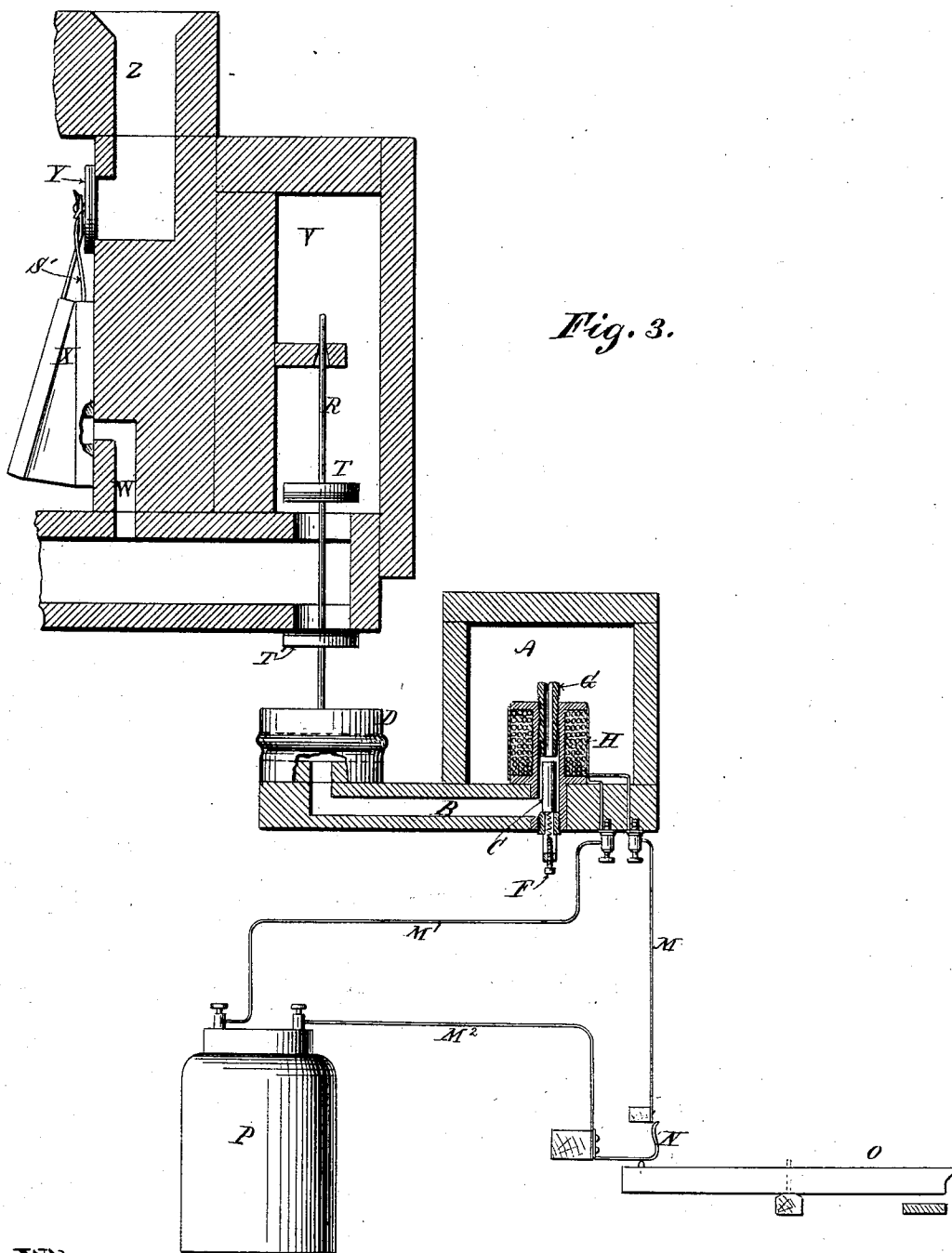
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UNITED STATES PATENT OFFICE.

HILBORNE L. ROOSEVELT, OF NEW YORK, N. Y.; ALFRED ROOSEVELT
EXECUTOR OF SAID HILBORNE L. ROOSEVELT, DECEASED.

ELECTRIC ORGAN-ACTION.

SPECIFICATION forming part of Letters Patent No. 374,088, dated November 29, 1887.

Application filed September 28, 1886. Serial No. 214,780. (No model.)

To all whom it may concern:

Be it known that I, HILBORNE L. ROOSEVELT, of the city, county, and State of New York, have invented a new and useful Improvement in Electric Organ-Actions, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

The object of my invention is to produce a simple and economical electric organ-action, by which the flow of air which is to do work in connection with the operation of the organ can be exactly controlled by electro-magnets.

By my invention I provide a simple apparatus which can be operated without springs, and in which the valve adjustments are very accessible, and in which the operation of the valve is made certain.

I am aware of the fact that spheres or balls have been employed as combined armatures and valves in connection with this class of apparatus; but such valves are necessarily imperfect, in that they have no definite point of contact with the seat and are in consequence liable to leak and otherwise operate unsatisfactorily.

The apparatus is exhibited in two forms, in one of which the cylindrical valve-armature is placed vertically and operated by the magnet and gravity and in the other of which it is placed horizontally and operated by two magnets.

The apparatus will be readily understood from the accompanying drawings, in which—

Figure 1 represents a cross-section showing the details, and Fig. 2 a cross section of a modification. Fig. 3 represents a general view showing in one form the electrical connections and an attachment to the organ.

Similar letters, so far as possible, refer to similar parts.

In Fig. 1, A represents a wind-chest. Within this wind-chest is placed an electro-magnet, H, having a tubular core. This tubular core G is threaded into the hollow center of the electro-magnet, so that it may be vertically adjusted by means of the screw-threads shown. C represents a cylindrical valve-armature adapted to enter partly within the coils of the electro-magnet H. The upper end of

this cylindrical valve-armature is adapted to fit against the valve-seat at the bottom of the hollow core G. Of course a valve of leather or other suitable material may be employed at both ends of the armature when desired. Beneath this valve-armature C is the adjustable screw valve-seat E. This is likewise faced or shaped to correspond with the face of the lower end of the cylinder C and may be vertically adjusted. This valve seat is likewise tubular and has air-passages L to the external air. The spring-adjusting screw F is screwed into the lower part of this adjustable valve-seat and serves to adjust the tension of spring S, bearing against the lower end of the valve-armature C. An air-passage, B, connects the pneumatic bellows D with the armature and magnet in the manner shown.

The screw F and spring S may be dispensed with, though I find them advantageous in reducing the weight of the valve-armature C. The position of the valve-armature with relation to the magnet and the amount of its throw can be exactly regulated, by reason of the fact that it is held between the two hollow adjusting-screws. The pneumatic bellows D is employed to operate other parts of the organ in the well-known way. The operation of this apparatus will now be readily understood. When no current is upon the electro-magnet, the armature assumes the position shown in Fig. 1. The air-pressure passes through the hollow core to the tube B and distends the bellows D. When, however, a current is sent through the electro-magnet, the armature C is drawn upward, closing the air-passage through the tubular core G and allowing the escape of the air within the bellows through the opening in the valve-seat E through passage L to the atmosphere, and therefore the collapse of the pneumatic bellows.

In Fig. 2 the armature, which in this case may be provided with leather faces, is horizontally arranged and is controlled by two magnets, H and J. Each of these magnets is provided with an adjustable hollow core, which can be moved through the magnet by means of the screw-thread shown. Proper slots may be provided for operating these hollow cores, and suitable openings in both apparatuses may be

arranged, by means of which said screws G E may be turned.

In Fig. 2 the operation is the same as in Fig. 1, excepting that the electro-magnet J is employed, instead of gravity, to withdraw the valve-armature C from the electro-magnet H. In both figures, of course, the valve-armature is made less in diameter than the tube in which it reciprocates, thereby enabling the passage of air around it. By this arrangement it will be seen that I insure the simplest possible apparatus, which may be operated without springs of any kind, while at the same time the apparatus is provided with a very simple means of adjustment. I dispense with the necessity of having two air-channels through the same magnet, and in the form shown in Fig. 1 I avoid the necessity of making an air-tight connection at the upper part of the magnet by placing the entire magnet within the wind-chest, which wind-chest serves to protect the magnet from possible injury, and at the same time affords a convenient means of admitting the air-pressure through the magnet-core.

The actions are shown in detail in Fig. 3, in which the organ-key is shown at O. An electrical contact is made by this key with the spring N when the key is depressed. This completes the circuit from the battery P through the wire M², spring N, wire M, and magnet H, wire M', to battery P. The pneumatic bellows D when filled closes the valve T' and opens the valve T. The chamber V is filled with compressed air, and under the circumstances shown this air passes by the valve T, through the passage W, into the pneumatic bellows X, and thereby closes the valve Y and the wind-passage Z, which leads to the organ-pipe. If, now, the key O be depressed, the armature C is drawn upward and air escapes from the pneumatic bellows D, the valve T is closed, the valve T' opened, the air within the bellows X escapes to the atmosphere, the valve Y is raised by the spring S', and air passes from the inclosed chamber (not completed in the drawings) to the passage Z.

I do not in this application claim the general system of operating the organ shown, intending to make a separate application therefor, but limit this application to the electro-pneumatic valve, as herein claimed.

I do not in this application make claim to the form shown in Fig. 2, intending to make separate application therefor.

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

1. The combination, in an electric organ-action, of a magnet having a hollow core provided with a flat valve-seat, a detached cylindrical armature-valve moving in guide-channels having two faces, one at its upper and the other at its lower end, and a second flat valve-seat opposite the first valve-seat, the ends of the cylindrical valve-armature being made to fit tightly the said two valve-seats, substantially as described.

2. The combination, in an electric organ-action, of a magnet having a hollow core provided with a flat valve-seat, a detached cylindrical armature-valve moving in guide-channels having two faces, one at its upper and the other at its lower end, a second flat valve-seat opposite the first valve-seat, the ends of the cylindrical valve-armature being made to fit tightly the said two valve-seats, and the air-channel and pneumatic bellows shown, substantially as described.

3. The combination of a hollow electro-magnet having a longitudinal adjustable cylindrical tubular core, an independent cylindrical armature, and an adjustable valve-seat opposite the magnet valve-seat, whereby the throw and position of the armature with reference to the magnet can be exactly determined, substantially as described.

4. The combination of the electro-magnet H, the tubular adjustable core G, the cylindrical double-faced valve-armature C, and the hollow valve-seat E, provided with air-passage L to the atmosphere, substantially as described.

5. The combination of the electro-magnet H, the tubular adjustable core G, the cylindrical double-faced valve-armature C, and the hollow valve-seat E, provided with air-passage L, and the pneumatic bellows D, substantially as described.

6. The combination, in an electric organ-action, of electro-magnet H, adjustable cylindrical tubular core G, cylindrical armature-valve C, adjustable valve seat E, having air-passage L, and adjusting screw and spring F and S, substantially as described.

7. The combination, in an electric organ-action, of a magnet having a hollow core provided with a flat valve-seat, an armature-valve entering the bobbin of the magnet and guided thereby and having two faces, one at its upper and the other at its lower end, and a second valve-seat opposite the first valve-seat, the ends of the valve-armature being made to fit the said two valve-seats, substantially as described.

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

HILBORNE L. ROOSEVELT.

Witnesses:

KATE S. ROOSEVELT,
F. E. HISCOCKS.