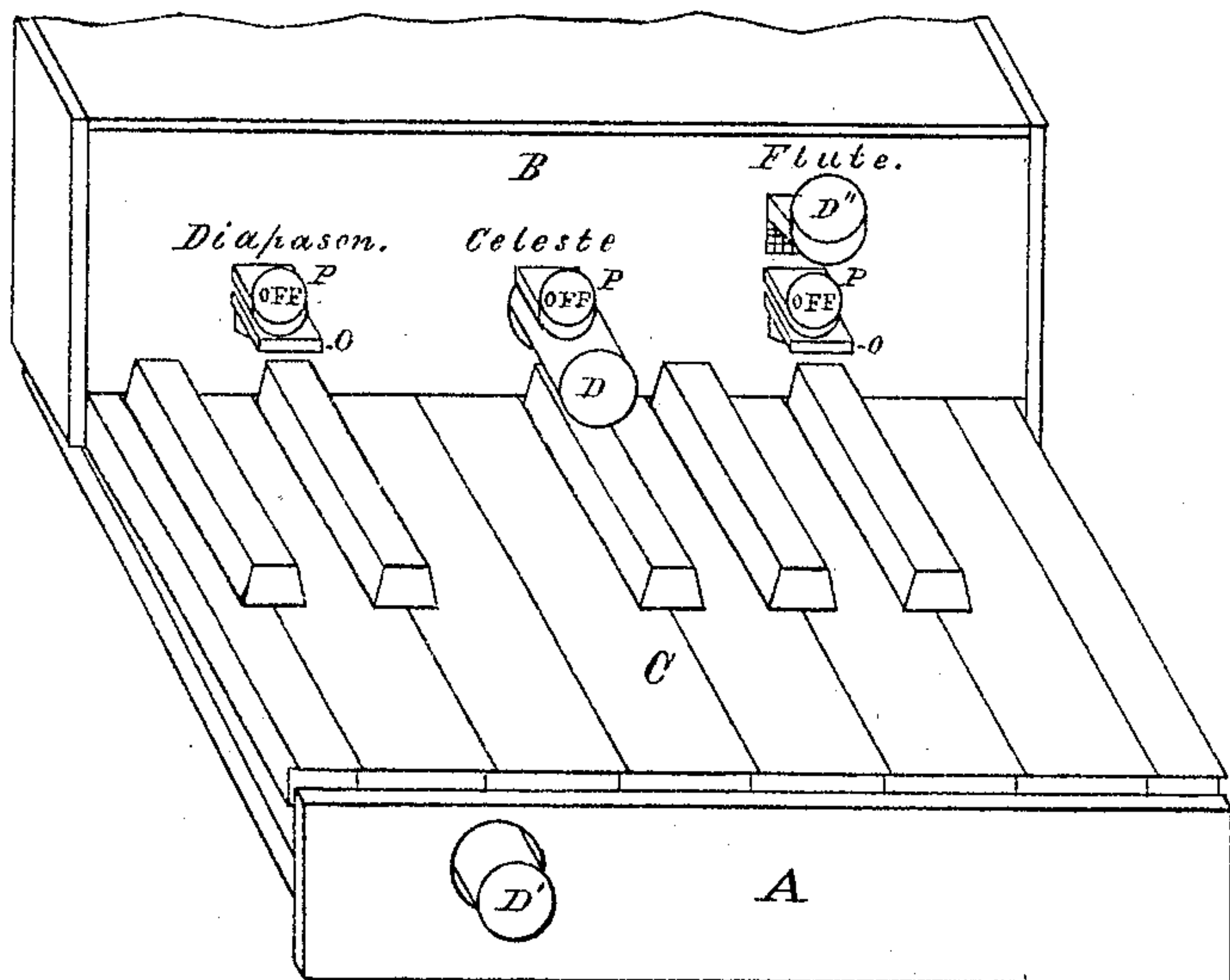


**J. A. SMITH.**  
**Organ-Stop Actions.**

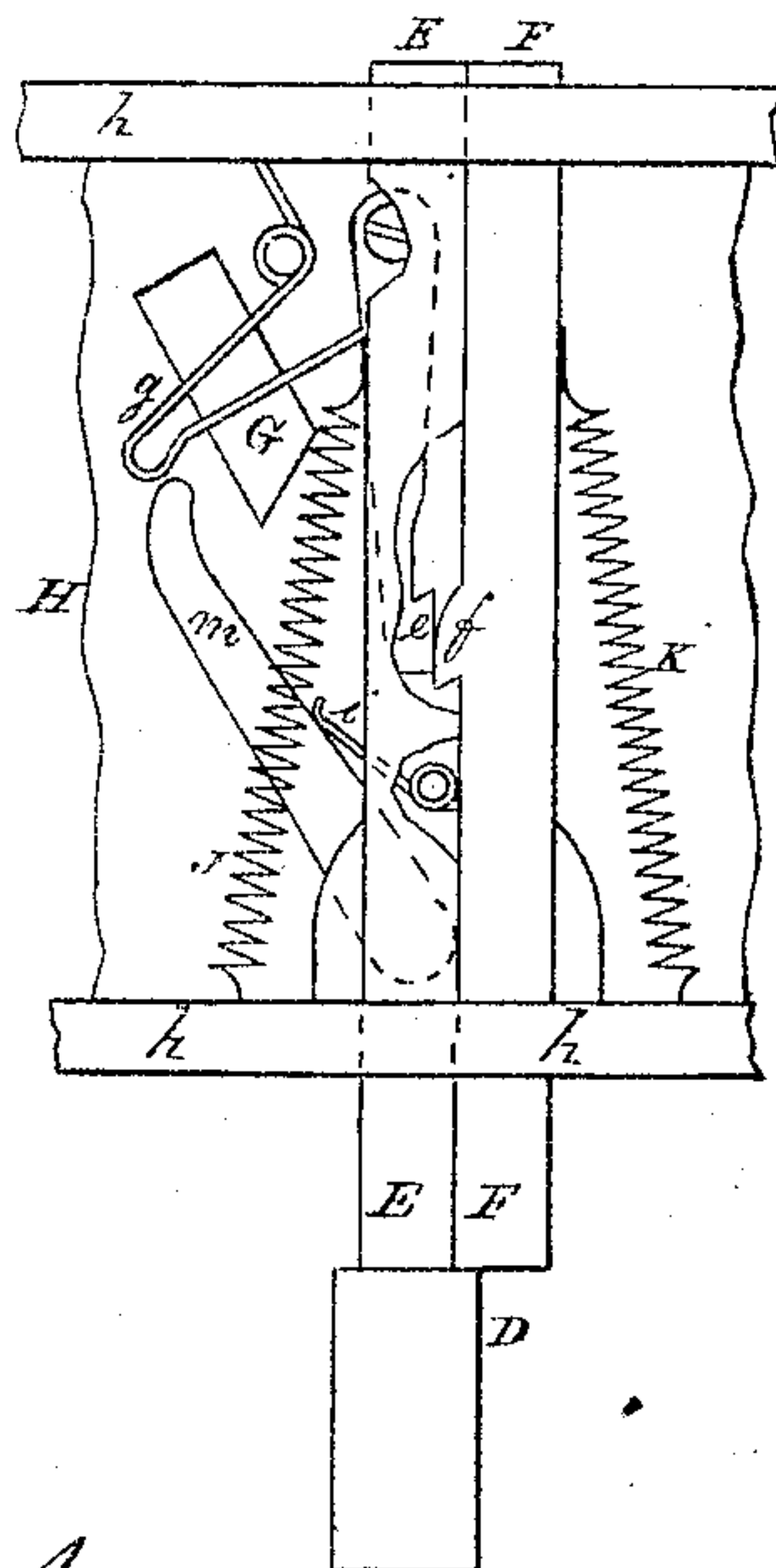
No. 141,469.

Patented August 5, 1873.

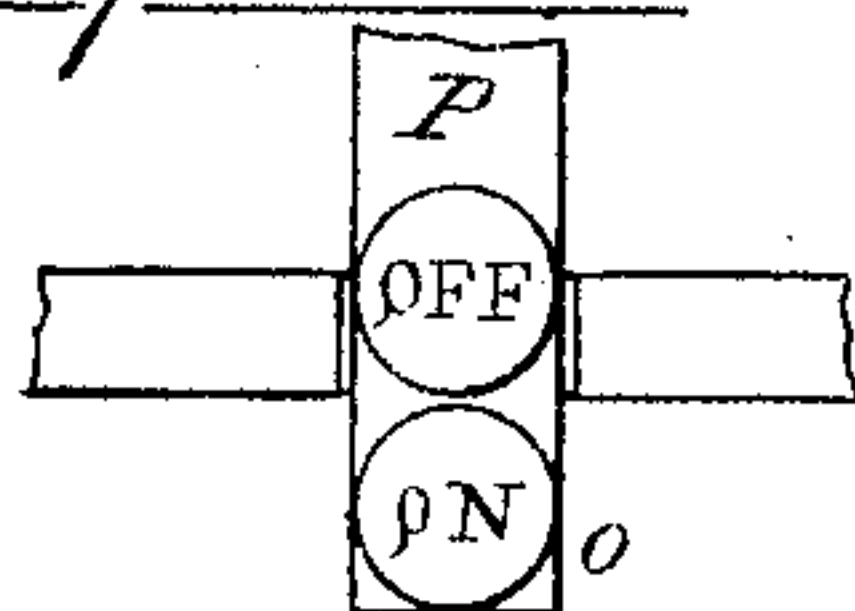
*Figure 1.*



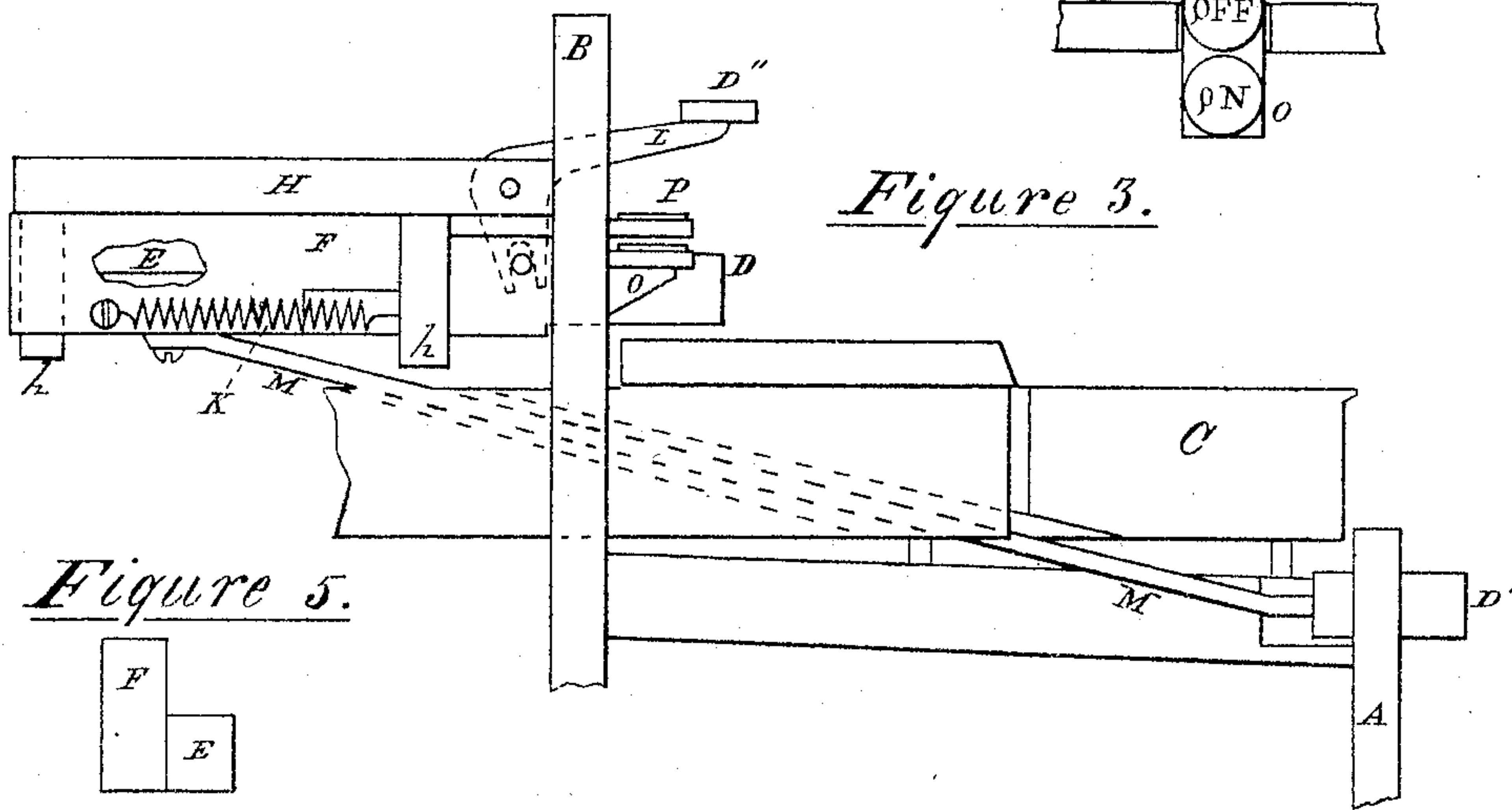
*Figure 2.*



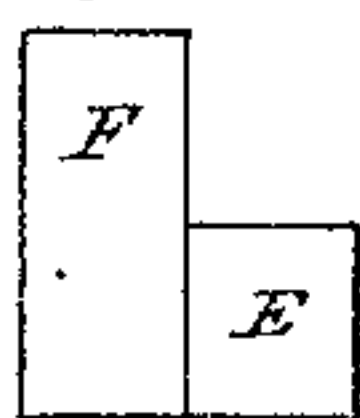
*Figure 4.*



*Figure 3.*



*Figure 5.*



Witnesses.

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# UNITED STATES PATENT OFFICE.

JOHN A. SMITH, OF ERIE, PENNSYLVANIA.

## IMPROVEMENT IN ORGAN-STOP ACTIONS.

Specification forming part of Letters Patent No. **141,469**, dated August 5, 1873; application filed October 29, 1872.

*To all whom it may concern:*

Be it known that I, JOHN A. SMITH, of Erie, in the county of Erie and State of Pennsylvania, have invented a new and Improved Device for Operating the Stops of Organs; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

The first part of my invention relates to the device whereby I operate the stops of the organ, which consists of plungers or slides, and hooks, pawls, springs, &c. The second part of my invention relates to the position in which I place the stop-keys, and the manner in which I operate them. The third part of my invention relates to the manner in which I indicate the position of the stops, and also the names of the stops.

My invention is illustrated by the drawing, as follows: Figure 1 is a perspective view of a section of an organ key-board, showing the key-slip A, name-board B, and keys C, as in an ordinary organ, and also showing my newly-invented stop-keys D, D', and D'', as well as my mode for arranging them for operation by the hand, and also my device for indicating the positions of the stops. Fig. 2 is a plan view of the stop-action device. Fig. 3 is a transverse section of the key-board and adjacent parts of an organ, showing my several devices therein embodied. Figs. 4 and 5 are views of detached parts.

The first part of my invention is illustrated in Fig. 2, and the following is a full description of its construction and action: It is composed of the following parts, as shown by the letters of reference. E and F are the slides or plungers, and by connecting the stop-levers therewith, as the case may require, the organ-stops are operated when the plungers are operated. Of these two plungers, F may be called the stop-actuating and E the manipulated plunger, for F comes in contact with the stop-lever and E, by means of key D or D' or D'', comes in contact with the operator's hand. These plungers, as well as their accompanying mechanism, are attached to what I call an action-board, H, which consists of the board H and the guide-cleats h h.

The action of these plungers is as follows: When the operator pushes in the key D both plungers are carried back, and on his removing his hand from the stop-key D the plunger F remains back, but the plunger E, with the stop-key D, returns to its former position. But when again pushed in by the operator the plunger F returns with it. Thus it will be seen that the same movement, or a like movement, rather, upon the stop-key D produces opposite results upon the plunger F, and hence upon the organ-stops to which it may be connected.

To enable those skilled in the art to which my invention relates, I will describe the construction and operation of the mechanism producing these opposite results.

First, as to the construction of the plungers. They are of wood. Their relative size is shown in Fig. 5, as is also their position to each other. They are of the same length, but not necessarily so. The view shown in Fig. 2 is from underneath, when the action-board is placed in the position shown in Fig. 3. The plungers are provided at their lower or outer ends with stops l l. In Fig. 2 plunger E is shown with a part of itself broken away, revealing the pieces of mechanism below, as follows, viz., a hook or catch pawl, e, is attached to the under side of the action-board H, and is actuated by the spring g and a catch-block, f, on the side of plunger F with which the catch-pawl e engages. A small spring, i, is attached to the plunger F, and operates against a pawl, m, which is pivoted on the under side of the plunger E. This pawl m is also operated upon by another small spring from the other side. This spring is not shown in the drawing, being very small, and being capable of being placed in various positions, its office being to sustain the pawl m in position when not depressed by the spring i.

A minute description of the action of these parts is as follows: The operator shoves in the key D. This action carries in both of the plungers, and when the catch f reaches the proper position it is engaged by the catch-pawl e. During this movement the spring i has kept the pawl m depressed. The catch-pawl having engaged with the catch f, the plunger F is retained when the operator re-



moves his hand from the key D, but the plunger E is free and the spring J throws it back. The spring *i* being attached to the plunger F, it no longer depresses the pawl *m*, which is held erect by the spring mentioned above. When the operator again shoves in the key D the plunger E goes forward alone, carrying the pawl *m* in an erect position, the end of which, however, soon comes in contact with the oblique stop-block, or rather switch-block G, which diverts its movement against the spring *g*, the pressure against which withdraws the catch-pawl *e* from its engagement, and, the pressure of the operator's hand being removed, both plungers are at liberty to return together through the action of the springs J and K. Hence, the same or a like movement of the hand of the operator upon the stop-key D produces opposite results upon the plunger F and upon the stops with which it is connected. These plungers may not only be operated by the hand of the operator, but, through the proper levers and connecting-rods, by the foot or knee of the operator, and their position in the instrument makes no difference.

The above-described device alone may form a distinct article of manufacture. These devices will be made in groups of as many as may be desired, and all attached to one action-board, which can be attached to any form of organ, and the devices will be connected with the operator, and with the several stops, in such a manner as it may please the organ-maker.

The second part of my invention relates to one manner of connecting these devices with the operator, the position in which I place the stop-keys which operate the same, and the manner in which they are operated.

My drawing illustrates two forms in which I accomplish the same result, and also two forms of arranging the stop-keys.

The stop-keys are marked D, D', and D''. (In describing the construction and operation of this part of my invention it becomes most convenient to describe also the third part of my invention.) Of these D and D' are piston or plunger keys, and D'' is a lever-key, all of which are operated by the hands of the operator. The piston-keys are operated by being pressed in by the operator, and the lever-key D'' by being pressed down by the operator. I believe this to be a sufficient description of the operation of these keys. They are connected either immediately or remotely with the plungers, as may be wanted. I place these keys either in the name-board B, above the keys C, or on key-slip A below the keys, or both, as I may desire. Those placed on the name-board will be operated chiefly by the fingers, and those in the key-slip by the thumbs of the operator, both of which movements will be perfectly natural, and leave the remaining digits free to operate the sounding-keys C. As I have placed the action-board H in this case, the keys D and D'' act immediately on

the plungers, while D' acts thereon remotely through the connecting-rod *m*. In either case—*i. e.*, whether the keys be in the name-board or in the key-slip—I have a register for each stop on the name-board, and with each name an indicator. Thus I have the names of each stop on some kind of a tablet set in the name-board, as *e. g.*, “diapason,” “celeste,” and “flute.” Below, or in immediate contact with these several names, I place a stationary and a movable tablet, indicating by the words “off” and “on” the position of the stop. Thus, for example, take diapason. In this case the stop-key is in the key-slip A. Beneath the word diapason is a small bracket, O, sustaining a small tablet with the word “on” upon it, over this is a movable slide, P, which is attached to the plunger F, either directly or remotely. This slide bears a tablet with the word “off” upon it.

As seen in the drawing, Fig. 1, diapason is off, but when the operator presses on the stop-key D' with his thumb, he puts diapason-stop on, and of course the slide P, with its tablet, is held back by the plunger F, and the word “on” is displayed.

I use the bracket O when I place the stop-key on the key-slip, and when I use the lever-key D''; but when I place the stop-key on the name-board, as D is placed, I dispense with the bracket O, and put the small tablet *d* on the top of the key itself, as seen in the drawing; the action of the slide P is, however, the same in all cases.

By placing the stop-keys on the name-board and on the key-slip, to be actuated wholly by the pressure of the thumbs or fingers of the operator, I avoid all the inconvenience now experienced by having to raise the hands from the keys, and draw or push back the various stops. The whole action is natural and convenient, and no interruption in the playing need take place.

In my drawing, I only represent one stop, as placed in the key-slip A; but it is intended to place all of the stops there, if so desired, in which case they will be arranged one after another in a series.

It will be observed that the position of the hand when playing leaves the thumb in such a position as to operate these stop-keys freely and easily. Their operation is such that they act wholly by pressure, and the thumb naturally having a wide sweep under the hand can operate quite a number. So all, or as many as may be desired, of the stops can be placed in a series along the key-slip.

The indicators herein described, no matter where their accompanying stop-keys may be placed, are always placed on the name-board B. These are also arranged in a series along the said name-board.

What I claim as new, and desire to patent, is as follows:

1. The stop-keys D D' D'', connected with the stops of the organ by plungers, pawls,



springs, levers, to cause like movements on the said stop-keys to produce opposite results upon the stops, substantially as set forth.

2. The plunger E, in combination with the plunger F, as shown and described.

3. The plunger E and pawl *m*, in combination with the plunger F and catch-pawl *e*, as shown and described.

4. The plunger E and pawl *m*, in combination with the spring *g* and catch-pawl *e*, as shown and described.

5. The stop-key D, D', or D'', in combination with the plunger E, as shown and described.

6. The movable tablet P, covering and displaying alternately the fixed tablet O, said device being in conjunction with the name of the stop, substantially as shown and described.

JOHN A. SMITH.

Witnesses:

JOHN K. HALLOCK,  
M. WARFEL, Jr.