

(No Model.)

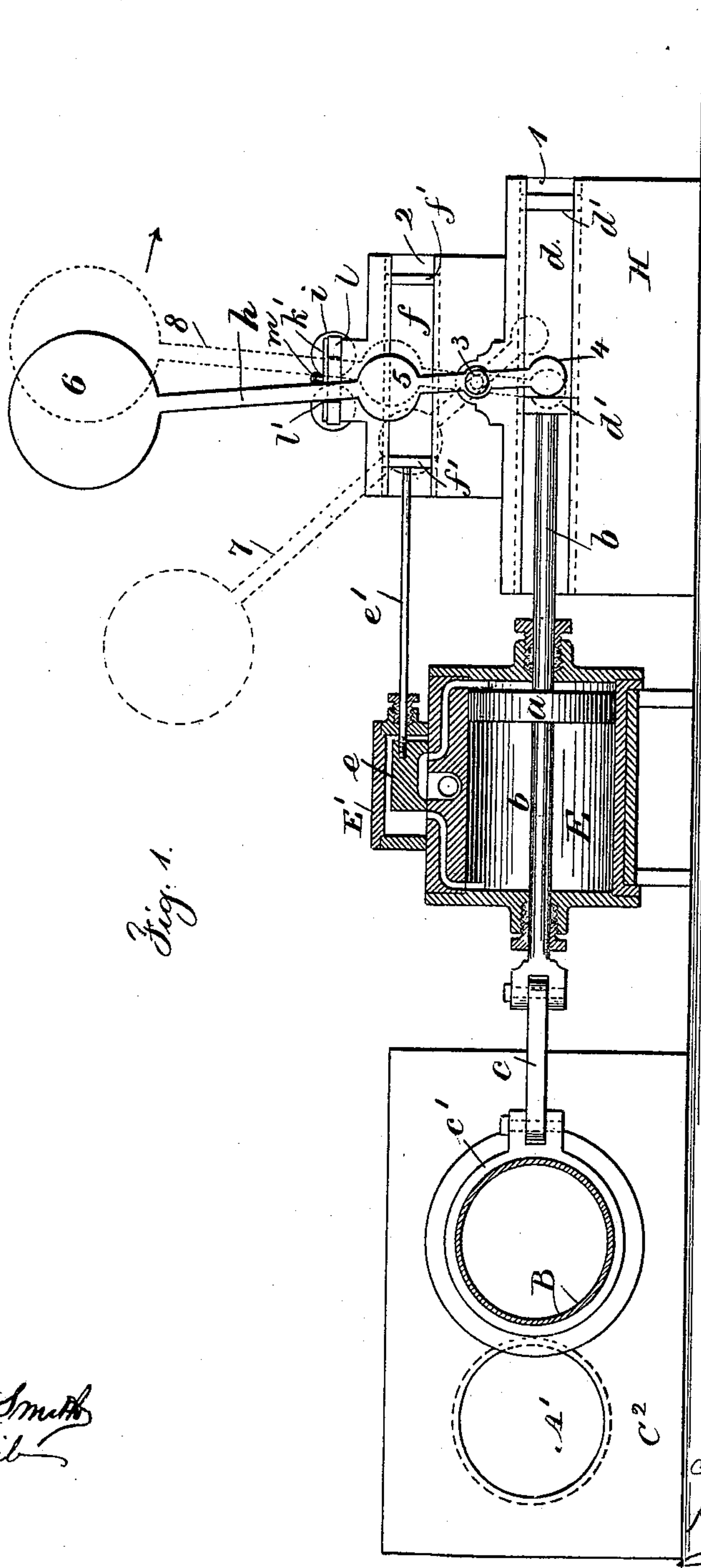
2 Sheets—Sheet 1.

P. KENNEDY, Jr.

PNEUMATIC SWITCH FOR PNEUMATIC DISPATCH TUBES.

No. 406,446.

Patented July 9, 1889.



Witnesses

Chas H Smith  
J. Hail

*Inventor*

Patrick Kennedy Jr

for L. W. Serrell

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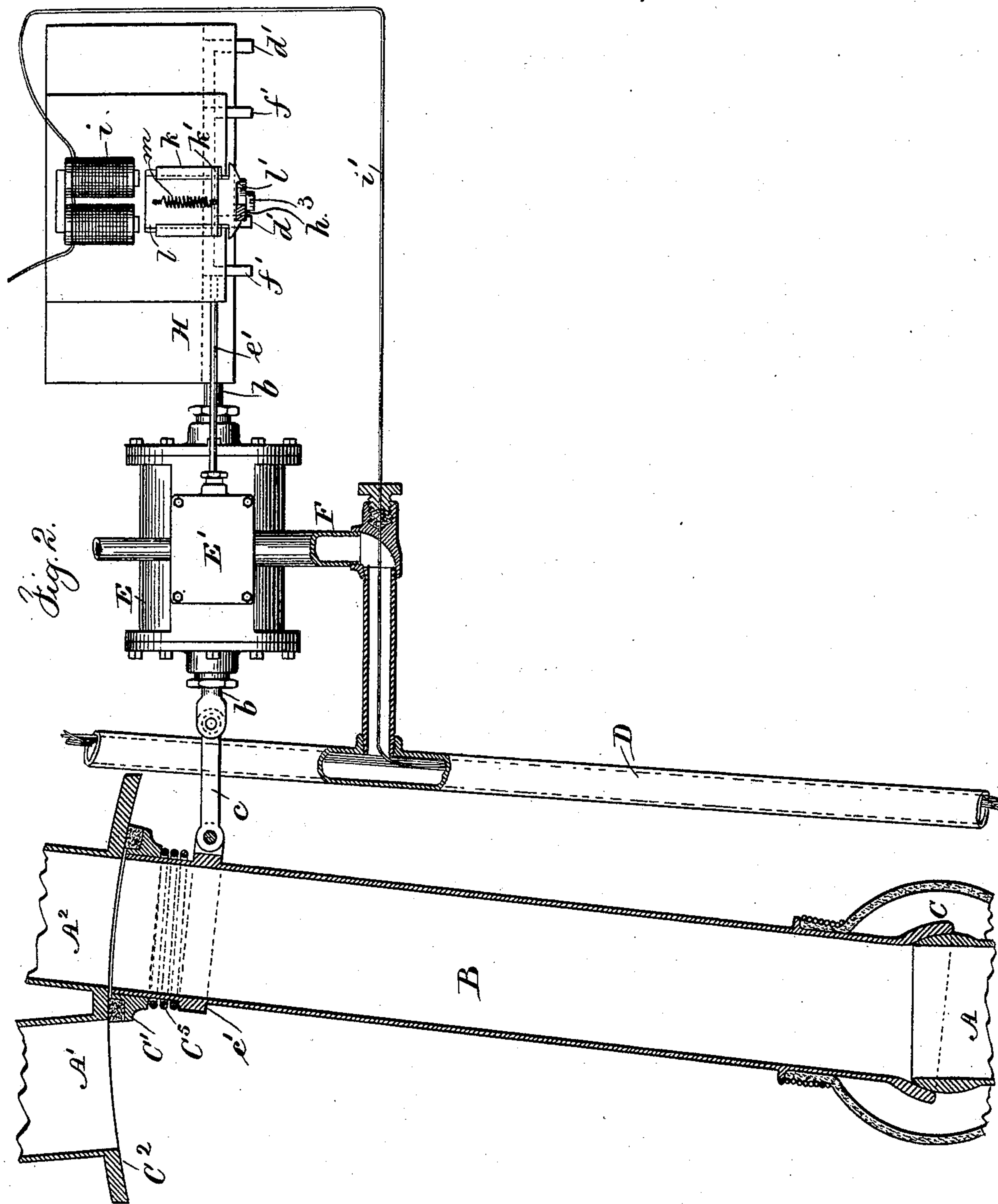
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per Lemuel W. Serrell  
att'y



# UNITED STATES PATENT OFFICE.

PATRICK KENNEDY, JR., OF BROOKLYN, NEW YORK, ASSIGNOR TO HIMSELF  
AND CHARLES J. DISS, OF SAME PLACE.

## PNEUMATIC SWITCH FOR PNEUMATIC DISPATCH-TUBES.

SPECIFICATION forming part of Letters Patent No. 406,446, dated July 9, 1889.

Application filed October 15, 1888. Serial No. 288,110. (No model.)

*To all whom it may concern:*

Be it known that I, PATRICK KENNEDY, JR., of the city of Brooklyn, county of Kings, and State of New York, have invented an Improvement in Devices for Operating Pneumatic Switches, of which the following is a specification.

Pneumatic tubes for message-carriers have heretofore been constructed with switches to divert the path of the message-carrier, and said switches have been operated by mechanical means; but such means as heretofore employed have not been entirely reliable, and have usually had to be operated at the spot where the switch was located.

My invention relates to devices for operating these pneumatic switches, which devices are operated by compressed air and electricity, and can be directed and controlled at any place from a central station; and my improved devices consist in a piston which is operated by compressed air to move the pneumatic switch, and said piston operates a weighted arm, which arm is electrically controlled, and in its turn operates the slide-valve of the compressed-air cylinder, so as to shift the same, when desired, to give access to either side of the piston; and said electrical devices consist of an electro-magnet and a sliding spring-catch which are adapted to hold and to relieve the weighted arm, as more particularly hereinafter set forth.

In the drawings, Figure 1 is a cross-section of the pneumatic switch and my improved operating mechanism, and Fig. 2 is a sectional plan of the same.

A A' A<sup>2</sup> represent the pneumatic tubes, through which the dispatch-carrier is projected in the usual manner, and B represents the pneumatic switch; and I have represented said switch as made with a ball-and-socket joint at C and with an air-tight collar C', which collar C' forms against the surface of the segment C<sup>2</sup>, connected to the pipes A' and A<sup>2</sup>, an air-tight joint, said collar C' being held against the segment by a spring C<sup>5</sup>.

D represents a tube, which may be of any length, and is supposed to be laid through the ground alongside of the pneumatic tubes A A' A<sup>2</sup>, and said tube D is strongly made

and adapted to hold compressed air, and also serve as a conduit for electric wires, especially the electric wires necessary to operate my improved switch-operating mechanism.

E represents an air-cylinder, and E' an air-chest connected therewith, and F a tube connecting the air-chest to the tube D, whereby compressed air is admitted into the air-chest and cylinder, and said air-cylinder may be supported in any suitable manner and contained within any suitable inclosure in proximity to the pneumatic switch to be operated.

At H, I have represented a frame-work having slideways 1 and 2.

a represents a piston, and b a piston-rod, the same being adapted to move in and through the air-cylinder E, the piston-rod at both sides of the cylinder passing through stuffing-boxes in the usual manner, and upon one end of the piston-rod b is a yoke, to which the link c is pivotally connected, said link c also being pivotally connected to a yoke formed with the collar c', which collar is secured to and around the pneumatic switch-tube B, and upon the other end of the piston-rod b there is a slide-block d, having right-angled projections d' at its respective ends, and moving in the slideway 1.

e represents the slide-valve in the air-chest E', and the rod e' passes through the stuffing-box in said air-chest, and is connected to the slide-valve e at one end, and upon the other end of said rod e' is a slide-block f, having right-angled projecting ends f' and adapted to move in the slideway 2.

h represents a vertically-placed arm, pivoted at 3 upon the side of the frame H, and having a circular end at 4 and a circular portion at 5, and a weight 6 at the upper end, the circular end 4 being adapted to come against the right-angled projections d' of the slide-block d, and the circular portion 5 being adapted to engage the right-angled projections f' of the slide-block f as the vertical arm h moves.

i represents an electro-magnet secured upon the frame H, and i' a wire from said electro-magnet, which wire passes into the tubes D F. Upon the frame H there are slideways k,



and connecting said slideways is a cross-bar  $k'$ , and there is a slide-block  $l$ , which is adapted to move through the grooves of the slideway  $k$ , and I provide a helical spring  $m$ , one end 5 of which is connected to a pin on the cross-bar  $k'$  and the other end to a pin on the slide-block  $l$ . One end of the slide-block is located a short distance away from the outer ends of the pole-pieces of the electro-magnet  $i$ ; and 10 the other end of the slide-block is notched at  $l'$  across its face, and the vertical arm  $h$  is placed directly in the path of the notch  $l'$ , so that at times said arm will rest in the notch at either side, a vertical line drawn through 15 the pivot 3 of said arm coinciding with the center of the notch  $l'$ . When the electric current is passed through the wire  $i'$  and through the electro-magnet  $i$ , the slide-block  $l$ , which is virtually the armature, is attracted 20 toward the poles of the magnet, and should the arm  $h$  be in the notch of the block  $l$  at this time the withdrawal of the slide-block will permit the arm  $h$  to fall either at one side or the other.

25 The operation of the parts is as follows: Presuming said parts to be in the position shown in Figs. 1 and 2, the pneumatic switch B being in line with the pneumatic tubes A  $A^2$ , the circular end 4 of the arm  $h$  touching 30 one of the projections  $d'$ , and being held by the notched or latched end of the slide-block  $l$ , and it being desired to shift the pneumatic switch B into line with the tube A', this operation is accomplished as follows: The electric 35 current is passed through the wire  $i'$  and electro-magnet  $i$  and the slide-block  $l$  is attracted to it, thus releasing the arm  $h$ , which falls over into the dotted position 7, Fig. 1, and the electric current is then shunted, and the spring 40  $m$  returns the block  $l$  to its normal position. The circular portion 5 as the arm  $h$  falls strikes the projection  $f'$  and moves the rod  $e'$  and shifts the slide-valve  $e$ . Compressed air is now applied through the tubes D F and air-chest E' to the back of the piston A, and said 45 piston is moved through the length of the cylinder E, moving with it the piston-rod  $b$ , the link  $c$ , and shifting the pneumatic switch B into alignment with the tube A'. This operation brings one projection  $d'$  of the slide-block  $l$  against the circular end 4 and raises 50 the weighted arm  $h$  and engages the same with the notched or latched end of the slide-block  $l$  into the dotted position 8. If it is desired 55 to again bring the pneumatic switch B into alignment with the tube A', the electric current is again sent through the wire  $i'$  and electro-magnet  $i$  and the block  $l$  is drawn toward said magnet, and this releases the vertical arm 60  $h$ , so that the same will fall in the direction of the arrow, and in its fall strike against the other projection  $f'$  of the slide-block  $f$  and shift the rod  $e'$  and slide-valve  $e$  back into the position shown in Fig. 1, in which position 65 compressed air through the pipes D F and air-chest E' will shift the piston  $a$ , its rod  $b$ , the link  $c$ , and the pneumatic tube B back

into the position shown in the drawings, and this movement of the piston-rod  $b$  will bring one projection  $d'$  against the circular end 4 70 and raise and again latch the vertical arm  $h$  in the slide-block  $l$ , so that the operations just described can be repeated indefinitely.

My improved pneumatic-switch-operating mechanism is automatic, and adapted to be 75 operated by electricity and compressed air at any distance from a given point, and the same is simple in construction and effective in operation.

I claim as my invention— 80

1. The combination, with the pneumatic tubes and a switch, of an air-cylinder and its piston-rod adapted to be operated by compressed air, and a weighted pivoted arm operated by the piston-rod and electrically controlled and adapted to shift the slide-valve of 85 the air-cylinder, substantially as set forth.

2. The combination, with pneumatic tubes and a switch, an air-cylinder, its chest, piston-rod, and slide-valve, of the frame having 90 slideways, slide-blocks having right-angled projecting ends, and connected, respectively, to the piston-rod and rod of the slide-valve, and a weighted arm moving in a vertical plane and electrically controlled and operated 95 by the piston-rod and adapted by its movement to shift the slide-valve, substantially as set forth.

3. The combination, with pneumatic tubes and a switch, of the piston and piston-rod 100 connected to the switch and adapted to be operated by compressed air, the slide-blocks  $d$  and  $f$  and their projections  $d'$  and  $f'$  and slideways for the same, a vertical weighted pivoted arm  $h$ , having a circular end 4 and a circular 105 portion 5, the electro-magnet  $i$ , the slide-block  $l$ , having a notched outer end adapted to engage the arm  $h$ , and a spring  $m$ , substantially as set forth.

4. The combination, with the pneumatic 110 tubes and a switch, of an air-cylinder and its piston-rod adapted to be operated by compressed air, a slide-valve and rod, and a pivoted arm electrically controlled and adapted to shift the slide-valve and rod, substantially 115 as specified.

5. The combination, with pneumatic tubes, a switch and a cylinder for compressed air, and mechanism connected with said cylinder for operating said switch, of an electro-magnet  $i$ , 120 a slide-block  $l$ , having a notched end and acting as an armature moving in one direction, a spring for moving the slide-block in the reverse direction, and with mechanism, substantially as set forth, engaging the notched end 125 of the slide-block, and adapted by its release from said slide-block to operate the slide-valve of the air-chest, substantially as set forth.

Signed by me this 2d day of October, 1888.

PATRICK KENNEDY, JR.

Witnesses:

GEO. T. PINCKNEY,  
WILLIAM G. MOTT.