

No. 626,320.

Patented June 6, 1899.

M. CLARK.  
PNEUMATIC ORGAN.

(Application filed June 4, 1898.)

(No Model.)

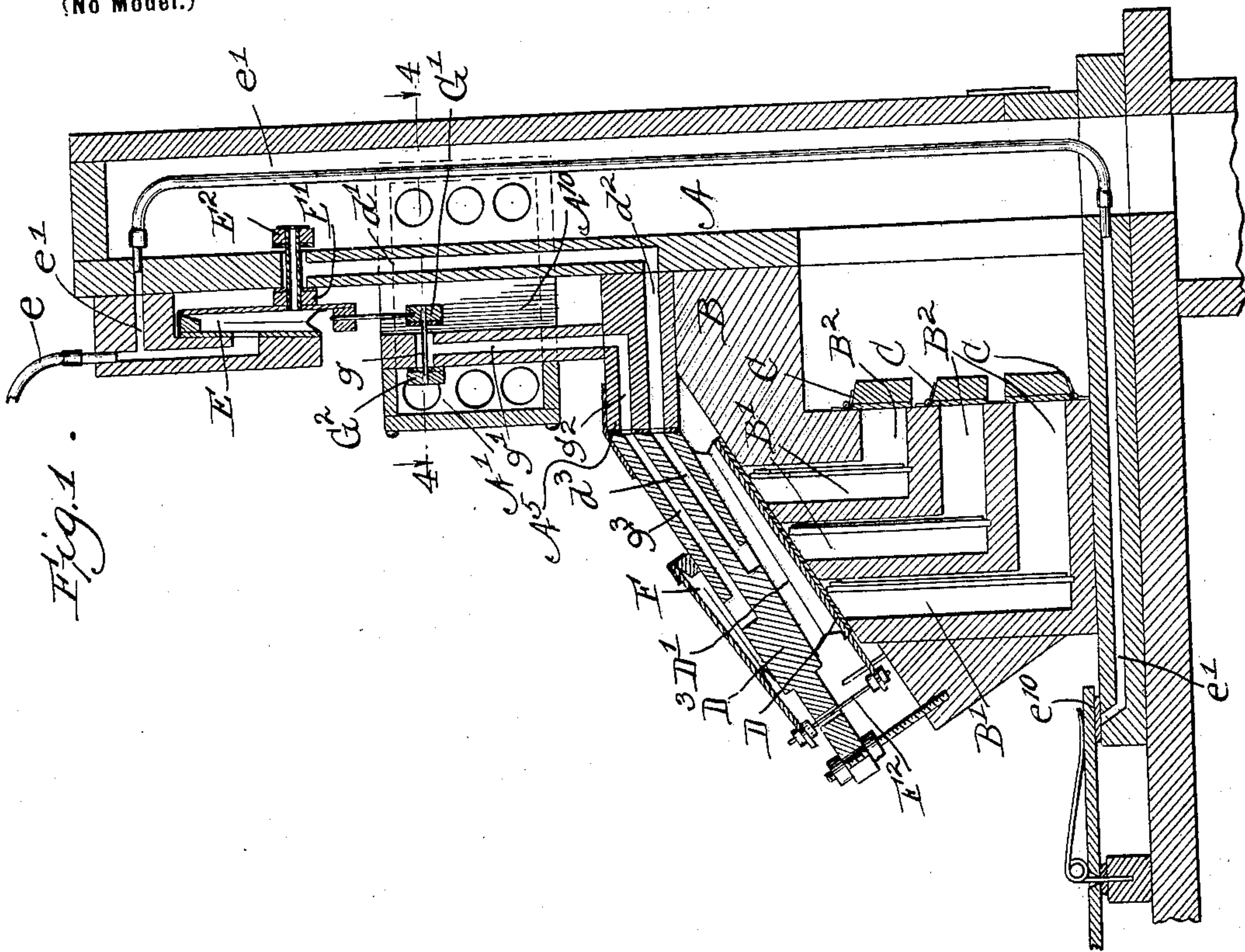


Fig. 1.

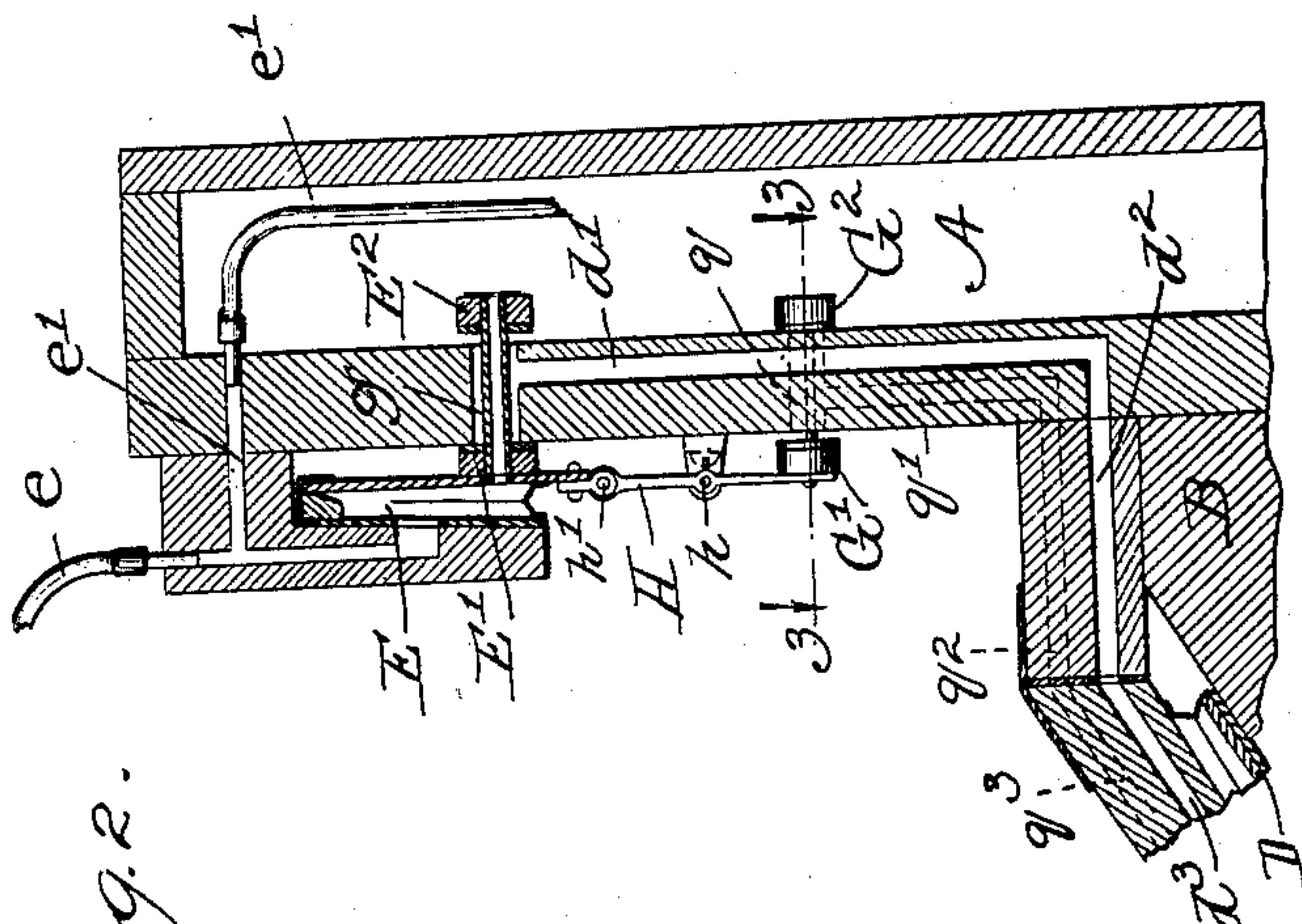


Fig. 2.

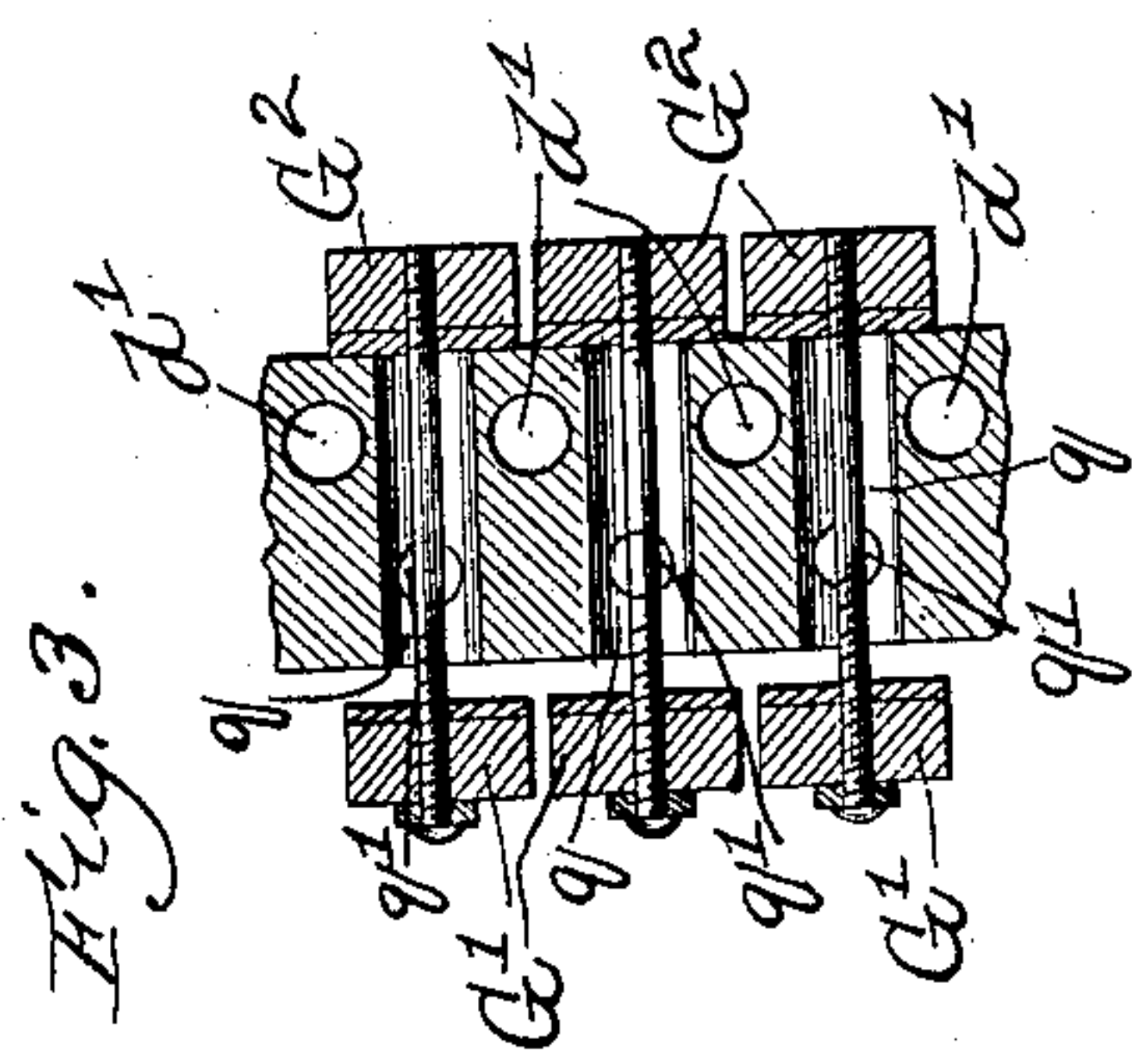


Fig. 3.

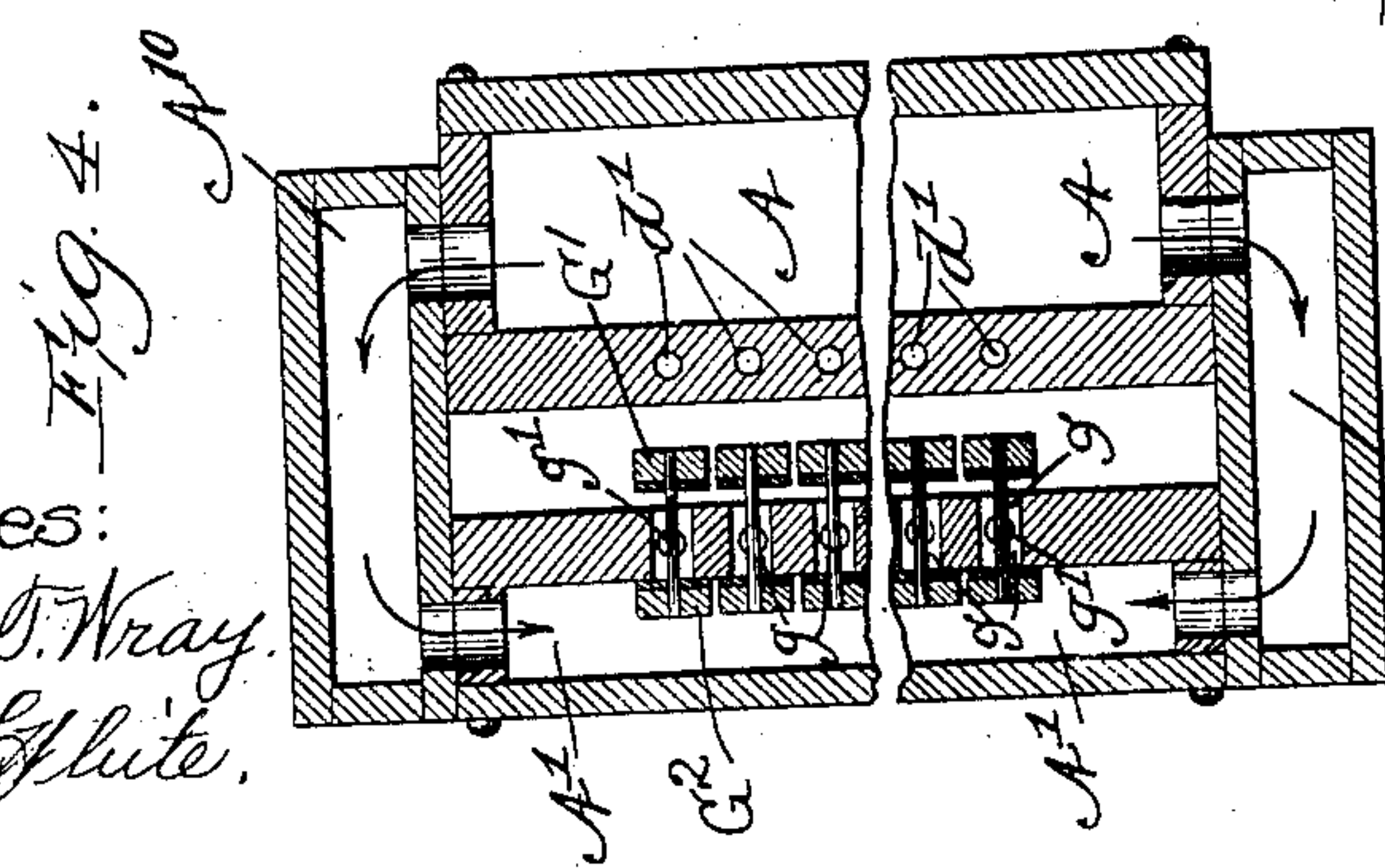


Fig. 4.

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# UNITED STATES PATENT OFFICE.

MELVILLE CLARK, OF CHICAGO, ILLINOIS.

## PNEUMATIC-ORGAN.

SPECIFICATION forming part of Letters Patent No. 626,320, dated June 6, 1899.

Application filed June 4, 1898. Serial No. 682,561. (No model.)

*To all whom it may concern:*

Be it known that I, MELVILLE CLARK, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Pneumatic-Organs, which are fully set forth in the following specification, reference being had to the accompanying drawings, forming a part thereof.

10 In the drawings, Figure 1 is a vertical fore-and-aft section through the wind-chest, reed-block, and pneumatics of an organ having my improvements. Fig. 2 is a detail section in a similar plane, showing a modification in respect to a certain feature. Fig. 3 is a section at the plane of the line 3 3 on an enlarged scale. Fig. 4 is a detail section at the plane of the line 4 4 on Fig. 1.

20 This invention is designed to effect an increase in the promptness of response of a pneumatically-operated reed-valve and adapt it to respond to very light tension in the reed-chest, which operates both the sound-producing devices and the valve-operating pneumatics.

25 It consists in providing a supplementary pneumatic which operates contrary to the valve-actuating or motor pneumatic, with the result that in case of a motor-pneumatic, which acts positively in one direction when put into communication with the wind-chest and reacts in the other direction merely by relief from the influence of the wind-chest, the reed-valve shall give a positive action in such opposite direction by means of the supplementary pneumatic, and to this end it involves providing such supplementary pneumatic with communication with the wind-chest, controlled so as to be opposite that of the motor-pneumatic-controlling valve—that is to say, 30 so that the supplementary pneumatic is exposed to the influence of the wind-chest when the motor-pneumatic is relieved from that influence and is relieved when the motor-pneumatic is exposed. By this means both movements of the reed-valve are controlled by the direct influence of the wind-chest and may be made equally prompt and positive.

35 A represents a vertical wind-chest, such as I have shown in my various former patents.

B is a block containing the reed-chambers B' B' B', with their appropriate reeds and

communicating by their throats B<sup>2</sup> B<sup>2</sup> B<sup>2</sup> with the wind-chest, into which their openings are controlled by mutes C C C.

55 D is the reed-valve, which seats at the outer ends of the reed-chambers. It is formed as the moving wall of the motor-pneumatic D'. This motor-pneumatic is controlled in its action by a primary pneumatic E, which actuates the oppositely-seating valves E' E<sup>2</sup> to control the communications of the motor-pneumatic through the ducts d' d<sup>2</sup> d<sup>3</sup> with the wind-chest and with the outer air. In the construction shown in Fig. 1 there is a wind-chest annex or supplemental chamber A', which extends across in front of the main chamber A and communicates with the latter by the hollow bracket-arms A<sup>10</sup> A<sup>10</sup>, by which it is also supported on the main wind-chest.

70 F is a supplementary pneumatic, which is mounted on the outer side of the back D<sup>3</sup> of the motor-pneumatic D' and is controlled by valves G' G<sup>2</sup>, which are connected and actuated by the primary pneumatic E and seat at opposite ends of the port g, which is formed in the wall of the supplemental chamber A' and connected by a duct g' g<sup>2</sup> g<sup>3</sup> with said supplemental pneumatic. The action of the two pairs of valves E' E<sup>2</sup> and G' G<sup>2</sup>, which are actuated by the same primary pneumatic E, is opposite—that is to say, the expanding movement, which seats the valve E' and unseats the valve E<sup>2</sup>, thereby putting the motor-pneumatic in communication with the wind-chest and cutting off its communication with the outer air, seats the valve G<sup>2</sup> and unseats the valve G', thereby opening communication of the supplementary pneumatic F with the outer air and cutting off its communication with the wind-chest. The collapsing movement of the primary pneumatic, reversing both valves, leaves them again oppositely related to the pneumatics which they respectively control. The moving wall of the supplementary pneumatic F is connected by a link F<sup>2</sup> to the reed-valve D, so that the inflation of the supplementary pneumatic tends to unseat said valve, while the inflation of the motor-pneumatic tends to seat it. The relative position in which I have shown the various parts in the drawings is that which would obtain in case of a blast-organ—that is, one in which the air is under compression in the wind-



chest. In such case the primary pneumatic, being in communication with the wind-chest and being inflated and not being vented, either by the uncovering of the port in the tracker-range, to which the duct  $e$  leads, nor  
 5 by the uncovering of the port of the duct  $e'$ , which is closed by a valve  $e^{10}$ , adapted to be operated by a manual-key, the motor-pneumatic is inflated by communication with the  
 10 wind-chest, the valve  $E^2$  being open, and the supplementary pneumatic is deflated, in communication with the outer air, because the valve  $G'$  is open. Upon the venting of the primary pneumatic by the uncovering of an  
 15 aperture of the tracker-range or by the action of a manual-key the primary pneumatic is collapsed, the valve  $E^2$  seated,  $E'$  opened,  $G'$  seated, and  $G^2$  opened, whereby the motor-pneumatic is vented—that is, put into com-  
 20 munication with the outer air—at the same instant that the supplementary pneumatic is inflated by being cut off from the outer air and put into communication with the wind-chest. Thus at the same instant that the  
 25 motor-pneumatic ceases to press the valve  $D$  on its seat the supplementary pneumatic operates positively to pull it off its seat. The prompt action thus produced is equaled by the prompt action in the other direction,  
 30 which results upon closing the vent of the primary pneumatic, causing it to become inflated and reverse the valves, so as to cause the inflation of the motor-pneumatic and the simultaneous inflating of the supplementary  
 35 pneumatic. The purpose of providing the supplemental wind-chest or annex chamber  $A'$  is simply that it is thereby made very convenient to obtain the opposite action of the two pairs of valves, while making both pairs  
 40 rigid with the moving wall of the primary pneumatic. Such opposite action, however, may be obtained by interposing a reversing-lever connection between the primary pneumatic and either pair of valves—as, for ex-  
 45 ample, the valves  $G'$   $G^2$ . This being done, the supplementary chamber may be dispensed with, and both valves may be located in precisely similar manner at opposite sides of the wall of the main wind-chest. Such construc-  
 50 tion is shown in Fig. 2, wherein a lever  $H$ , fulcrumed at  $h$  and pivotally connected at  $h'$  to the oscillating wall of the primary pneumatic, carries at its opposite end the valves  $G'$   $G^2$ , which control the port in the wall of  
 55 the main wind-chest, which, with its ducts leading to the supplementary pneumatic, operate precisely as the ports  $g$  and ducts  $g'$   $g^2$   $g^3$ , and are denoted by the letters  $q$ ,  $q'$ ,  $q^2$ , and  $q^3$ , respectively.  
 60 The back  $D^3$  of the motor-pneumatic, on which the supplementary pneumatic is also mounted, is hinged to the rib extension  $A^5$  of the forward wall of the wind-chest, and the ducts  $d^3$  and  $g^3$  in the back  $D^3$  register, re-

spectively, with the ducts  $d^2$  and  $g^2$  in the rib 61 when the back is in operative position, with its edge abutting against the edge of the rib, at which suitable surface is provided to make an air-tight joint and prevent leakage from the ducts. This construction is identical with 71 that which is shown in my application, Serial No. 681,468, filed May 23, 1898, except that in that application, there being no supplementary pneumatic, the ducts pertaining to it are not required; but in the present construction, as in the construction of that appli- 72 cation, the back  $D^3$ , being released at the forward edge, may be folded back at the hinged edge to give access to the reed-chambers.

I claim—

1. In a pneumatically-operated musical instrument, in combination with the valve which controls the sounding devices; a motor-pneumatic which operates such valve; a supplementary pneumatic adapted to operate the 8 valve in the opposite direction from the motor-pneumatic; a primary pneumatic which controls both the motor-pneumatic and the supplementary pneumatic; the valves which effect such control arranged to be actuated 9 by each action of the primary pneumatic oppositely with respect to the motor and supplementary pneumatics which they respectively control; whereby the motor-pneumatic is rendered active when the supplementary 9 pneumatic is rendered inactive, and the supplementary pneumatic is rendered inactive when the motor-pneumatic is active.

2. In a pneumatically-operated organ, in combination with the wind-chest and the reed-chamber exterior thereto, an exterior valve which controls such reed-chamber; a motor-pneumatic exterior to the wind-chest constructed and arranged to operate the reed-valves respectively; a duct leading from the 1 motor-pneumatic in an outer wall of the wind-chest to two terminals, one opening into the wind-chest and the other opening to the outer air; valves which control said terminals re- 1 spectively, and a primary pneumatic which operates such valves; a supplemental chamber or annex to the wind-chest having an outer wall facing an outer wall of the main chamber of the wind-chest; a duct in the wall of such supplemental chamber, and a supplementary pneumatic to which such duct leads, such duct having two terminals, one opening into the supplemental chamber and the other opening to the outer air, and valves which control said openings respectively connected 1 to and operated by the primary pneumatic.

In testimony whereof I have hereunto set my hand, in the presence of two witnesses, at Chicago, Illinois, this 2d day of June, 1898.

MELVILLE CLARK.

Witnesses:

CHAS. S. BURTON,  
 JEAN ELLIOTT.