

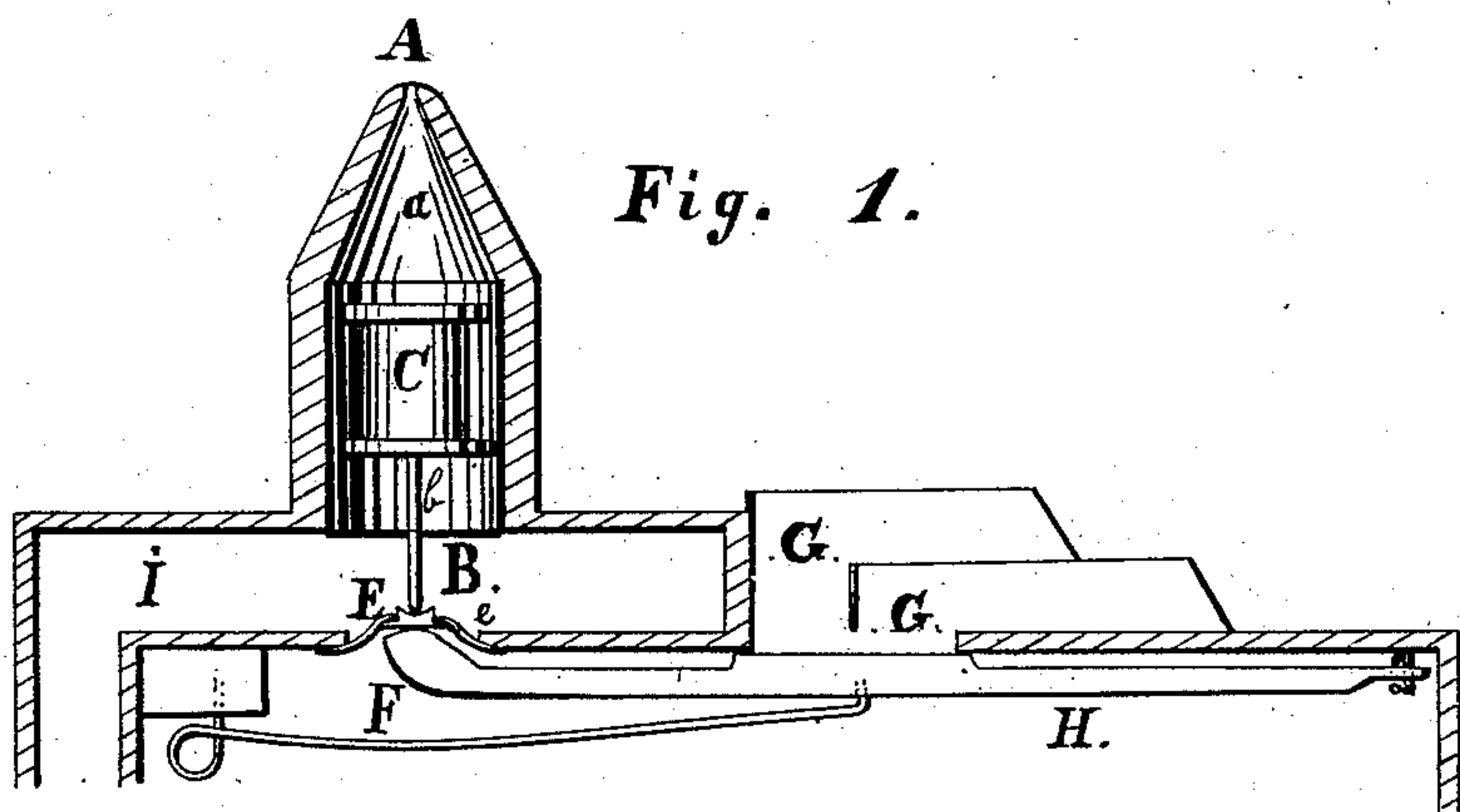
(No Model.)

F. PRITCHARD & G. H. AHLSTROM.

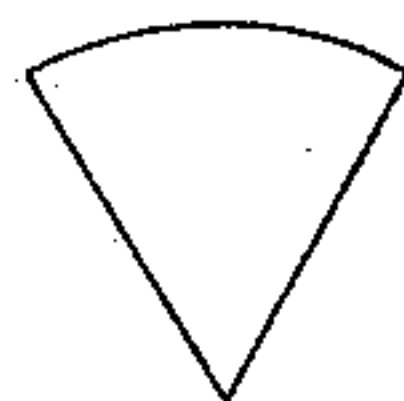
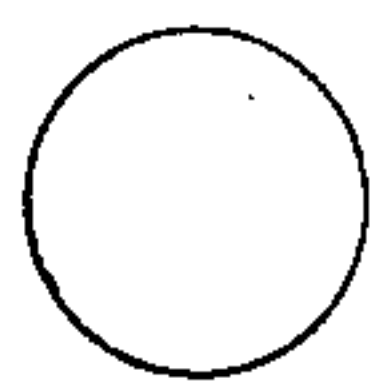
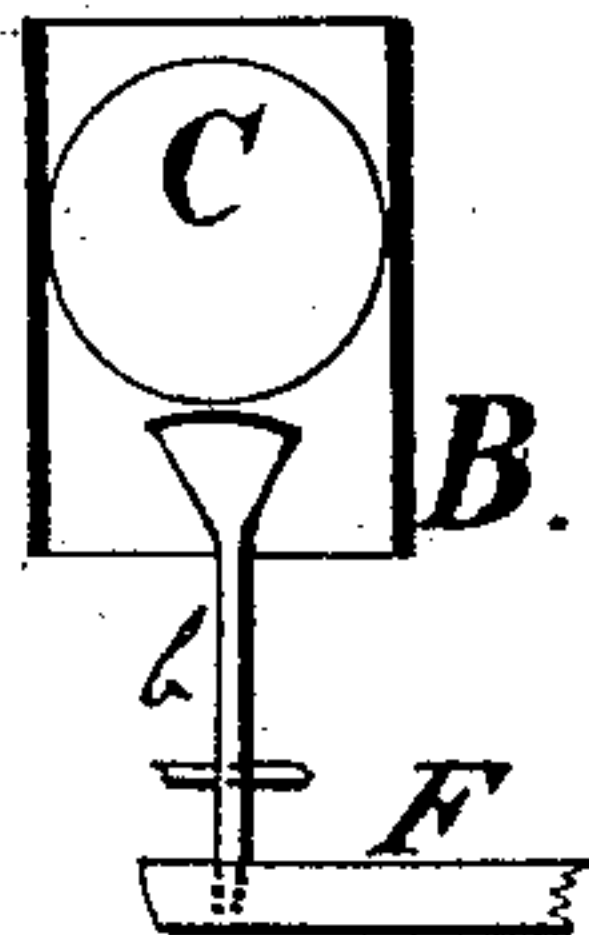
PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS.

No. 363,082.

Patented May 17, 1887.



*Fig. 2.*



*Fig. 3.*

WITNESSES

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# UNITED STATES PATENT OFFICE.

FREDERICK PRITCHARD AND GUSTAVE H. AHLSTROM, OF WORCESTER,  
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## PNEUMATIC ACTION FOR MUSICAL INSTRUMENTS.

SPECIFICATION forming part of Letters Patent No. 363,082, dated May 17, 1887.

Application filed March 3, 1886. Serial No. 193,820. (No model.)

*To all whom it may concern:*

Be it known that we, FREDERICK PRITCHARD, a British subject, and GUSTAVE H. AHLSTROM, a citizen of the United States, both residents of the city and county of Worcester, State of Massachusetts, have invented an Improved Pneumatic Operator for Moving Valves of Musical Instruments, of which the following is a specification.

Our invention relates more particularly to mechanical musical instruments, in which perforated paper or some device controls the air-passage and governs the play of the instrument. Its nature is fully shown in the following description and the accompanying drawings, which illustrate its application to a common form of such instruments.

In said drawings, Figure 1 is a sectional view of the adjacent parts and tube of the "operator" with the piston in the same and its connections; and Figs. 2 and 3 show some details, hereinafter more particularly described.

The same letters indicate the same parts wherever they occur.

A is the opening, over which the perforated paper is passed; B, the tube of the operator, connected by the passage *a* to opening A at one end and open to the exhaust-chamber I at the other.

C is a piston nearly filling the tube B, and capable of moving freely therein. This we preferably make with two heads, as shown, and having a stem, *b*, fastened to it below whose end rests in the cup E, by which the downward motion of the piston C is given through the cup E to lever F below, on which it rests.

F is the valve-lever to the reeds at G G, and H the exhaust-chamber operating the reeds when the valve is opened by the depression of the lever F by the piston C.

I is an exhaust-chamber separate from the one H, and at *e* is a space or opening through the separating-piece, and covered by a flexible collar whose edges are secured and to the middle of which the cup E is fastened, the flexibility of said collar being sufficient to allow all the motion desired to be given the valve-lever F, whose end rests against it, as shown. Thus it will be seen that the piston may be operated by the exhaust in chamber I and hold the lever F down any length of time without

admitting air to the chamber H from the opening A.

The cup E might be dispensed with by making a suitable depression in the lever F and allowing the flexible material to be depressed therein and receive the end of stem *b*; or the stem *b* may be replaced by a screw fast in the lever F, and, passing through the flexible partition, support the piston on its covered top, as in Fig. 2. With this form the piston may be globular and work in a smooth passage without a tube lining. This arrangement may be preferable when for any reason a more or less inclined position of the operator is desired; or the piston in B may be made with slightly-projecting ribs for an inclined position, and, if desired, more room for passage of air may be given by holes through the piston. It will be seen that the essential difference of our piston-operator is that the air lubricates the piston by passing by it as well as with it, so that it works with little or no friction, and also forms a relief to allow the piston to be quickly returned to place after the paper covers the hole, working without other opening for the escape of the air. The other figures are given to show some of the various forms in which the tube or passage may be made in section.

We are aware that a cylindrical pneumatic motor operating a valve-lever is not new, nor a diaphragm located between the lever and the plunger.

Having thus fully described our invention, what we claim therein as new, and desire to secure by Letters Patent, is—

1. The combination, in a mechanical musical instrument, of a pneumatic operator consisting of a loose piston in a tube or passage, in which air can pass at the sides of said piston, connected to the opening covered by the perforated paper, a separate exhaust-chamber working said operator, and another chamber and valve operated by said operator.

2. The piston moving freely in a tube or passage in which a portion of the air can pass by or around said piston, forming a lubricant moved by the action of the air in said tube or passage, in combination with means, substantially as described, for giving motion from said piston to the valves of the instrument.

3. The combination of the piston C, moving



in the tube B and having the stem *b*, with the seat E for the end of said stem, and the lever F below said seat, substantially as shown and described.

- 5 4. The combination of the two exhaust chambers described, having a flexibly-covered space between them, through which the independent pneumatic operator in one chamber works a valve or its connections on the other side of

the flexible covering in the other chamber so without the passage of air through said flexible covering.

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Witnesses:

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