No. 795,608. PATENTED JULY 25, 1905.

# W. E. HASKELL.

## PNEUMATIC.

APPLICATION FILED MAR. 30, 1905.

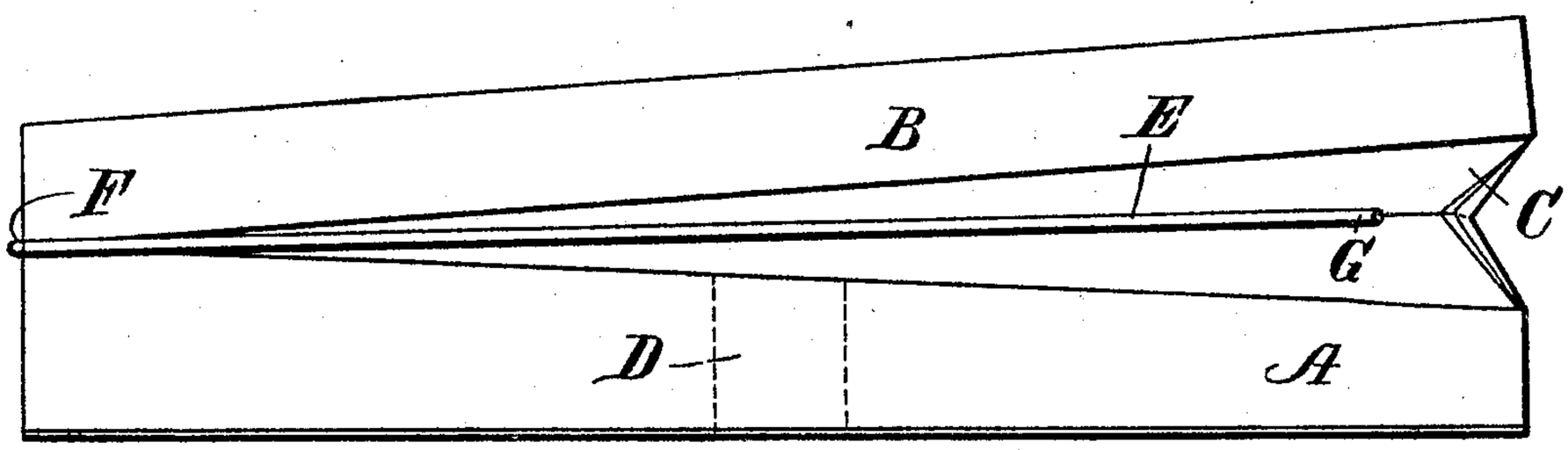


Fig. 1.

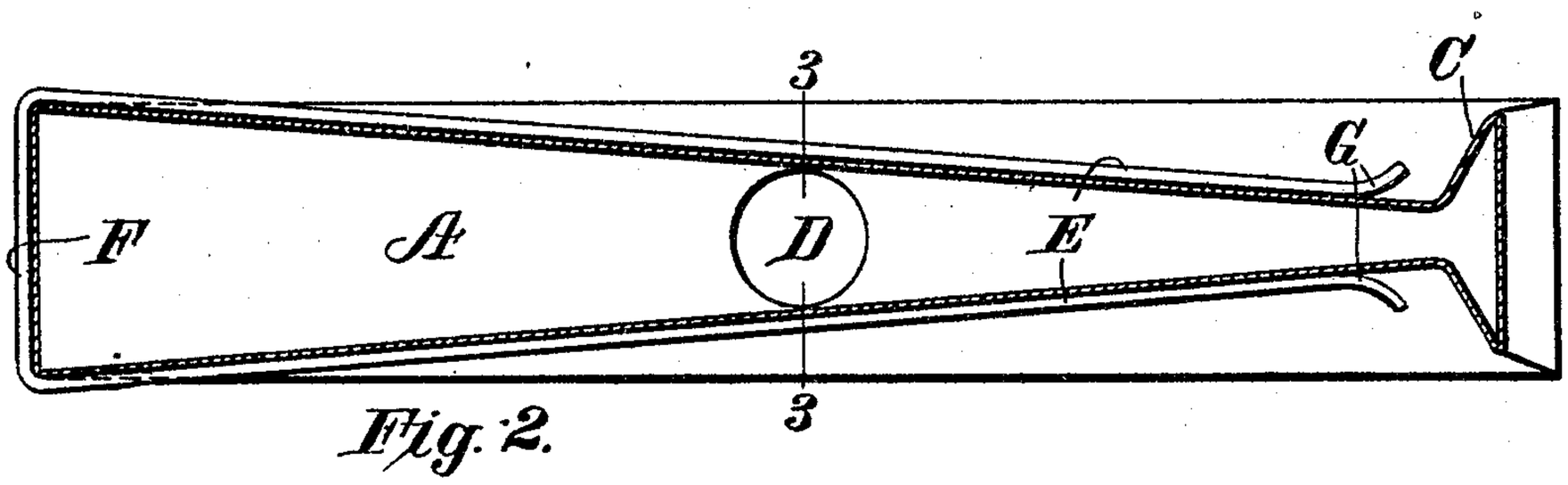


Fig. 2.

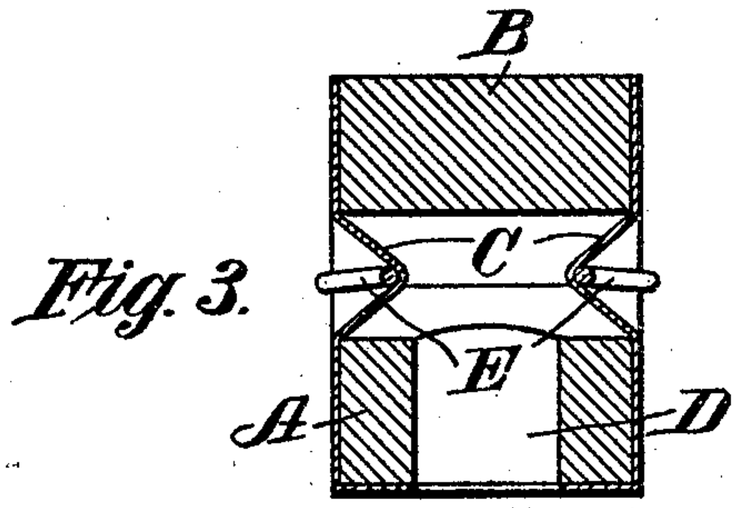


Fig. 3.

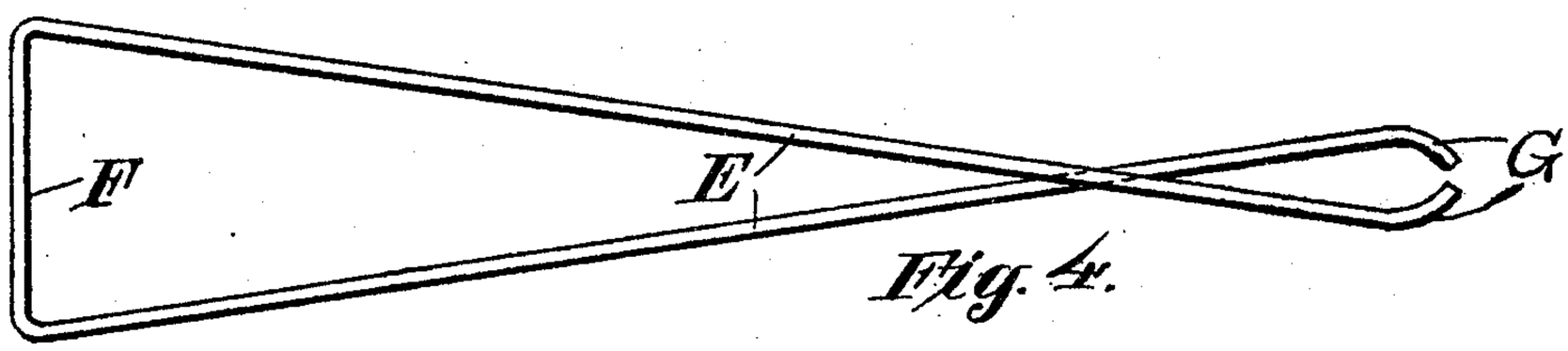


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## PNEUMATIC.

No. 795,603. Specification of Letters Patent. Patented July 25, 1905.

Application filed March 30, 1905. Serial No. 252,978.

*To all whom it may concern:*

Be it known that I, WILLIAM E. HASKELL, a citizen of the United States, residing at Brattleboro, in the county of Windham and State of Vermont, have invented certain new and useful Improvements in Pneumatics, of which the following is a specification.

This invention relates to the small bellows or "pneumatics" which are used in wind musical instruments, such as organs, for the purpose of pneumatically causing mechanical movement. Such pneumatics comprise a base and a movable board, which are united together by a flexible membrane, serving both as the hinge for the movable board and also as flexible walls to inclose an expansible and contractible space or chamber between the base and movable board into which air may be admitted and exhausted. These pneumatics frequently require to be placed very close to each other, and difficulty has arisen through interference between adjacent pneumatics. These pneumatics frequently are placed in such situation that they are called upon to receive interior air-pressure greater than the external air-pressure, and it frequently happens that the bellows folds of the uniting-membrane are blown outwardly by the greater internal air-pressure, so that the folds of the membrane project beyond the margins of the base and movable board and then interfere with the movement of adjacent pneumatics and prevent their proper movement.

The primary object of the present invention is to provide a pneumatic with a mechanical pressure device which shall exert a force upon the flexible walls of the membrane, serving to press the said walls inwardly or toward each other, thereby preventing the outward expansion of said walls. This mechanical pressure-producer not only has this beneficial effect of maintaining the membrane folds in proper position, but also through its action upon said membranes tends to restore the movable board to its deflated position after the interior inflating-pressure has been withdrawn.

The present improvements are illustrated in the accompanying drawings, which show a pneumatic on an enlarged scale.

In the drawings, Figure 1 is a side view of the pneumatic partly inflated. Fig. 2 is a longitudinal section in a plane taken between the base and movable board. Fig. 3 is a cross-section in the plane indicated by the line 3 3 in Fig. 2. Fig. 4 is a plan view of the pressure-producer detached.

A is the base, B the movable board, and C the flexible membrane uniting the base and movable board and with its bellows folds providing an expansible and contractible chamber between the base and movable board as well as constituting a flexible hinge for the movable board. Air is admitted to the interior of the pneumatic through the aperture D in the base. In these respects the pneumatic is similar to those which have been in extensive use in wind musical instruments.

The mechanical pressure-producer is shown detached in Fig. 4. As here shown, it is composed of spring-wire of any suitable resilient material, (preferably brass,) which is appropriately bent to form two opposite spring-fingers E E, united by a bar F, each finger having its free end bent to furnish a rounded bearing-surface G.

Fig. 2 of the drawings shows the mechanical pressure-producer properly assembled upon the pneumatic. As here shown, the cross-bar F of the pressure-producer rests upon the exterior of the pneumatic at its hinged end, and the two spring-fingers E E extend on opposite sides into the bellows folds of the flexible side walls of the membrane, the interior faces of the fingers bearing against the membrane-walls. The curved bearing-surfaces G at the points of the spring-fingers prevent cutting into and injuring the delicate material of which the flexible membrane is composed. These spring-fingers press toward each other, and hence exert a yielding pressure upon the flexible side walls of the membrane, tending to force them together. When the pneumatic is inflated, the spring-fingers are forced apart, thus increasing their tension, and they effectually prevent the blowing out of the bellows folds. At the same time when the internal air-pressure is relieved these spring-fingers are useful in promptly deflating the pneumatic, since their pressure upon the side membrane-walls tends to quickly collapse said walls by folding them inwardly. Hence the movable board is promptly restored to its deflated position, and this is of particular importance where there are equal air-pressures inside and outside of the pneumatic when deflated.

As the result of this improvement the membranes of the pneumatics may be made of very delicate material, so as to quickly respond to differences in pressure, and the pneumatics may be placed as closely together as may be desired without interfering with the others through the outward blowing of its bellows folds.

I claim as my invention—

1. A pneumatic having a mechanical pressure-producer tending to press inwardly its flexible walls.

2. A pneumatic having a flexible wall and a mechanical pressure-producer acting upon the exterior of said wall to press it inwardly.

3. A pneumatic having flexible side walls and a mechanical pressure-producer acting upon the outer faces of both of said side walls and tending to move said walls toward each other.

4. A pneumatic having, in combination, a base, a movable board, flexible walls uniting said base and board, and a pressure-producer consisting of resilient wire bent to form a cross-bar with two projecting spring-fingers, said pressure-producer embracing the pneumatic with its spring-fingers exterior to the side walls of the pneumatic and pressing them inwardly.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM E. HASKELL.

Witnesses:

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