(No Model.)

W. L. MERRIN.

ORGAN PIPE.

No. 265,973. Patented Oct. 17, 1882.

Fig: 1.

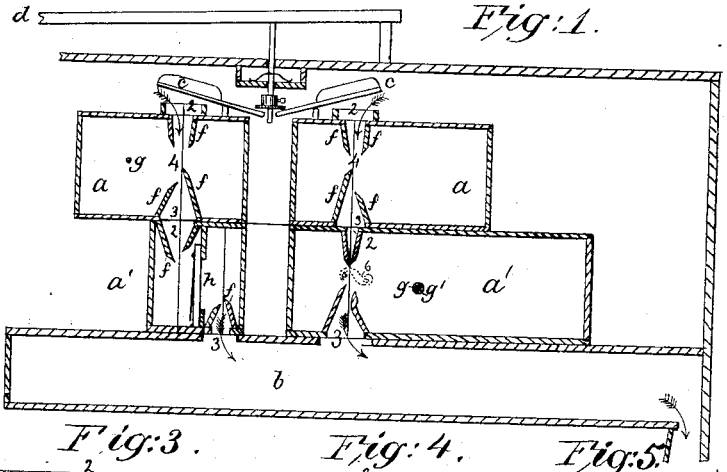


Fig: 2.

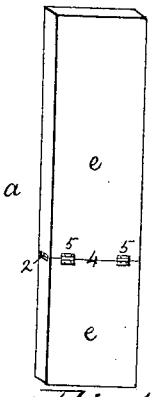
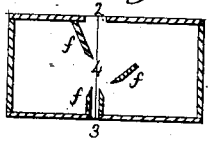


Fig: 3.



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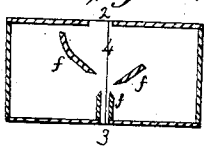

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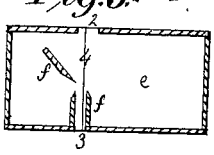


Fig: 11.

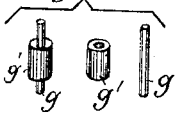


Fig: 6.

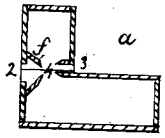


Fig: 8.

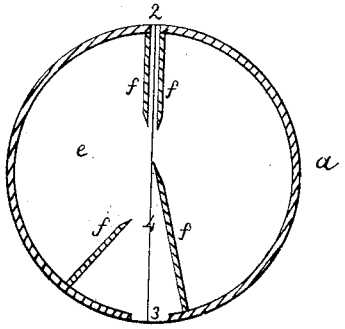


Fig: 7.

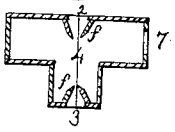


Fig: 9.

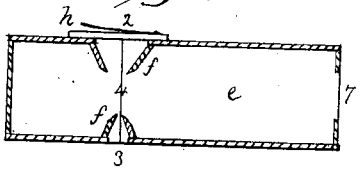
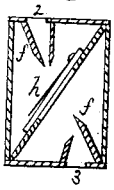


Fig: 10.



Witnesses.
L. F. Connor.
B. J. Noyes.

Inventor.
William L. Merrin
by Crosby & Gregory
Attys.

UNITED STATES PATENT OFFICE.

WILLIAM L. MERRIN, OF FREDERICKTOWN, OHIO.

ORGAN-PIPE.

SPECIFICATION forming part of Letters Patent No. 265,973, dated October 17, 1882.

Application filed March 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. MERRIN, of Fredericktown, county of Knox, and State of Ohio, have invented an Improvement in Organs, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to organs or similar musical instruments; and it consists mainly in a novel sound-producing device, having for its object to obtain a wide range of variations in musical sounds, it being adapted to be operated by pressure or suction, or, in fact, by any means commonly employed for operating pipes or reeds in organs.

In organ-pipes as commonly constructed the air enters at one end of the pipe and passes out through a mouth provided with a lip at the side of the pipe, the air striking the said lip, which sets the column of air in the pipe in vibration, and the moving current of air does not traverse the body of air in the pipe. In this construction the pitch is mainly dependent on the length of the pipe or column of air therein. In the organ-pipes known as "reed-pipes" the air, entering at one end, in passing out operates a reed, and the tone is dependent upon both the pitch of the reed itself and that of the column of air in the pipe.

My novel sound-producing device consists essentially of a chamber having openings in its side for the inlet and outlet of the air, which thus traverses the chamber in its passage, and the lips are placed wholly within the said chamber and in proper relation to the said inlet and outlet passages, to be effected by or to act upon the air passing therethrough. A device of this nature produces tones somewhat similar to those produced by organ-pipes, but differ in many properties from the said organ-pipes. The chambers are preferably made rather flat, having sides of large area, and I find that the tone produced does not depend wholly upon the body of air in the said chamber, although that enters as a factor in determining the tone and pitch. It would seem from some of the results obtained that the sides of the said chamber themselves vibrate, and to a great extent determine the nature of the sound produced, which is not the case in ordinary organ-pipes, where the sound is mainly dependent on the inclosed body of air.

This invention also consists in the combination of two or more such chambers so located that the air will pass from one into and through the other, whereby compound tones of peculiar quality may be produced.

It also consists in the combination, with a sound-producing chamber such as just described, of what I call "sound-posts," which are small posts extending across between and fastened to the sides of the said chamber, thus modifying by their position the sound produced. In some cases I provide these same posts with loose sleeves or collars, slightly shorter than the posts and movable thereon, such a device producing an effect similar to that of a beating-reed, and denominated by me a "beating-post."

This invention also consists in the combination, with a sound-producing chamber such as described, of a reed located at some point traversed by the air in passing from its inlet to its outlet, thus forming an instrument resembling what is known as a "reed-pipe." When consistent with the location of the inlet and outlet passages, the chamber is preferably made in two separable portions, to enable access to be readily attained to the interior for the purpose of adjusting the lips, and thus voicing or tuning the instrument. In some cases portions of the chamber may be left open, like an open-ended organ-pipe.

Figure 1 is a transverse vertical section of a portion of an organ provided with sound-producing devices embodying this invention; Fig. 2, a perspective view of a sound-producing chamber detached; Figs. 3, 4, and 5, modifications showing different arrangements of the lips in the said chamber, whereby different effects are produced; Figs. 6, 7, and 8, modifications showing different forms of the said chamber; Figs. 9 and 10, modifications showing different arrangements of the reeds in connection with the said chamber, and Fig. 11 a detail showing the beating sound-post.

The sound-producing instruments *a a'* are shown in Fig. 1 as employed in connection with a sound-chest, *b*, from which the air may be exhausted by apparatus such as commonly employed in cabinet-organs for producing currents of air. The passage of the air from the external atmosphere through the instruments *a a'* is controlled by valves *c*, operated by keys *d* in any suitable or usual manner, the key-operating mechanism being shown in this in-

stance as substantially the same as a former application, No. 31,184, filed by me April 19, 1881.

The sound-producing instrument consists of chambers *a*, such as shown in Fig. 2, having side walls, *e*, of considerable area relative to the other dimensions of the chamber, which is flat or thin, measured between the said side walls, and is provided at its edges with inlet and outlet passages 2 3 for the current of air by which the instrument is to be sounded.

Within the chamber, and properly arranged relative to the inlet and outlet passages, are lips *f*, having the usual beveled or wedge-shaped edge properly located to act upon or to be acted upon by the air in passing. The tone produced is found to depend upon the number and position of the said lips, which may be greatly modified, as shown in Figs. 1, 3, 4, 5, the said lips preferably being of such width as to be held in place between the opposite walls *e* of the chamber, so that their position can be varied or adjusted by the operator to produce the particular quality of tone desired.

The chambers are preferably made in two parts, as shown, they being divided on a plane, 4, passing through the inlet and outlet passages, and the parts being hinged together, as shown at 5, Fig. 2, so that access may be readily attained to the lips for the purpose of adjusting their position. Hook 6 (see dotted lines, Fig. 1) or other suitable fastening may be employed to keep the two parts of the chamber together.

I have found that the sound depends to a certain extent upon the vibration of the side walls, *e*, of the chamber, as plates, nodal lines being indicated upon them by the use of sand in a similar manner to that shown in the well-known experiments for illustrating the vibration of a plate, and I find that the tone can be varied by the employment of what I term "sound-posts," which consist of pegs or studs *g*, connected with the opposite sides of the chamber and controlling or modifying the vibrations thereof according to the location of the said posts. In some instances I employ a sleeve or collar, *g'*, surrounding the post *g*, and somewhat shorter than and free to move longitudinally on the said post, such a device being denominated by me a "beating-post," and producing an effect somewhat similar to that of a beating-reed.

It will be seen that the current of air has a positive movement through the chamber, and that consequently a series of two or more of the said chambers may be traversed by the same current of air, as shown in Fig. 1, thus forming a compound chamber or instrument *a a'* and producing complex sound effects such as cannot commonly be produced and controlled by a single key in organs of usual construction.

If desired, one or more reeds *h* may be placed in the path of the current of air and operated by it. The location of the said reed may be varied according to circumstances, as shown in Figs. 1, 9, and 10. The instruments *a a'* may be operated by a current of air forced instead of drawn through them, and in this case the chambers may be operated, as shown at 7, Figs. 7 and 9. The shape of the chambers may be varied according to the space they are to occupy in the organ or other apparatus, and also in some instances to modify the sound produced, several such shapes being shown in Figs. 6, 7, and 8.

I claim—

1. The herein-described musical wind-instrument, it consisting of a chamber having inlet and outlet passages for a current of air on opposite sides of the said chamber (both of small size) relative to the sectional area of the said chamber traversed by the said air-current, combined with a lip within the said chamber to act upon the said current of air, substantially as described.

2. The combination of a series of chambers each having inlet and outlet passages, the outlet-passage of one chamber communicating with the inlet-passage of the next of the series, to permit a current of air to flow through the entire series, each chamber being provided with internal lips, substantially as described.

3. The combination, with the chamber inclosing a body of air and provided with inlet and outlet passages on opposite sides of the said chamber, and of the small size relative to the sectional area thereof for a current of air therethrough, of a reed operated by the said air-current, substantially as described.

4. The chamber provided with inlet and outlet passages, combined with internal lips and a reed located in the path of the current of air through the said passages, substantially as described.

5. The air-chamber having its side walls of large area relative to the other dimensions of the chamber, and provided with small inlet and outlet passages in its edges, combined with a series of two or more internal lips secured between the said side walls, substantially as described.

6. The chamber having inlet and outlet passages and internal lips, combined with a sound-post fixed between the side walls of the said chamber, substantially as described.

7. The air-chamber, combined with the post fixed between its side walls and the loose sleeve or collar on the said post, whereby a beating effect is produced, substantially as described.

8. The chamber having inlet and outlet passages and internal lips, and divided or made in two portions for the purpose of rendering the said lips readily accessible, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM L. MERRIN.

Witnesses:
EVAN E. JONES,
JOHN Q. EVANS.