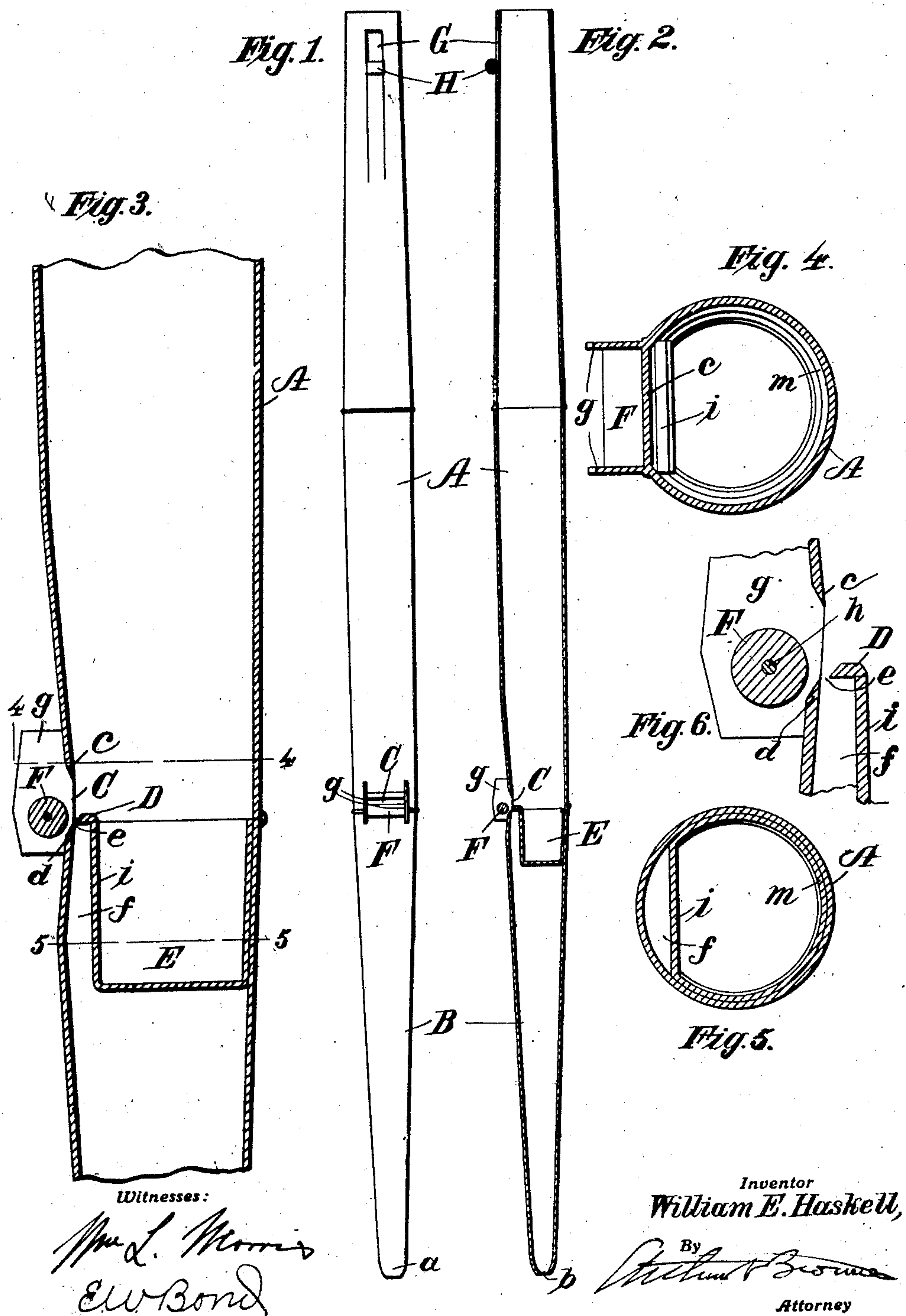


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PATENTED NOV. 19, 1907.

W. E. HASKELL.
ORGAN PIPE.

APPLICATION FILED JUNE 24, 1905.



UNITED STATES PATENT OFFICE.

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ORGAN-PIPE.

No. 871,272.

Specification of Letters Patent.

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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 Organ-Pipes, of which the following is a specification.

This invention has for its object the production of a set of metallic organ pipes which give a tone resembling that of an orchestral oboe.

In pipe organs in which the present improved set of pipes is employed, the stop controlling the same is called the "Oboe stop"; and the object of the present improvement is to secure this characteristic and peculiar tone by the construction and voicing of the pipe without the employment of any vibrating reed or other moving part.

The improvements are illustrated in the accompanying drawings in which—

Figure 1, is a front view of a metallic organ pipe embodying the improvements. Fig. 2, is a vertical longitudinal section. Fig. 3, is an enlarged vertical longitudinal section of the pipe in the vicinity of the mouth. Fig. 4, is a cross-section in the plane indicated by the line 4—4 in Fig. 3. Fig. 5, is a horizontal section in the plane indicated by the line 5—5 in Fig. 3. Fig. 6, is a detail view of the lower lip and the languid.

A, is the body of the pipe; B, is its foot, having toe *a*, with port *b*; C, is the mouth, having upper lip *c*, and lower lip *d*; D, is the languid, between which and the lower lip is the windway *e*; E, is a cup below the mouth, and between the front of which and the front of the foot is a throat *f*; F, is a roller or draft bridge in front of the lower portion of the mouth and mounted in vertically extending ears *g*, on opposite sides of the mouth; G, is the tuning slit, and H, is the tuner.

All of the pipes are made of the usual metal employed in the manufacture of metallic organ pipes. The smaller pipes of the stop are made of a composition of tin and lead and the larger pipes are made of zinc. The pipes are open at their tops.

In order that the characteristics of the improved set of pipes may be fully understood, a specification will be given of the exact details which have been followed in the commercial manufacture of the pipes.

The front of the pipe is flattened at the mouth so that the mouth extends in a plane

between the two ears *g, g*. The width of the mouth is the chord of one-fifth the circumference of the pipe. The height of the mouth is two-sevenths of the width of the mouth. Taking the major diameter of the pipe in the plane of the edge of the lower lip as the unit of measurement, the top of the pipe is four-fifths the diameter of the mouth, and the maximum diameter of the body of the pipe is six-fifths the diameter at the mouth. The maximum diameter of the body of the pipe is substantially half way between the mouth and the top of the pipe. The body of the pipe gradually diverges from the mouth to the middle, and then gradually converges from the middle to the top. The cup E, is an important feature of the pipe, and its depth below the level of the lower lip is equal to the diameter of the body of the pipe at its top. The voicing of the pipe is likewise important.

The upper and lower lips should be beveled as shown to have sharp edges. The roller or draft bridge F, is of wood, and is stationary between the ears, being fixed thereto by a pin *h*. The bridge is circular in cross-section, and its diameter is four-fifths the height of the mouth. It is so placed that its center is substantially on a level with the top of the lower lip, and the distance between it and the upper edge of the lower lip (at their points of nearest approach) should be approximately one-fifth the diameter of the bridge.

The bottom of the languid D, is at the same level as the top of the lower lip. The front face of the languid is beveled to a sharp edge. The width of the windway *e*, between the languid and the lower lip may be varied to a considerable extent, depending upon the volume of tone required and the depth of the nicking on the languid. As a proper average proportion, it may be stated that the windway may be about one-fortieth as wide as the mouth is wide.

The proportions of the foot B, with its inlet *b*, may follow ordinary organ practice in the construction of metal pipes, having no peculiarity in the present improved stop.

The lengths of the different pipes in the stop are, of course, determined by their pitch. In the stop which has been commercially adopted, the CC is the lowest note of an 8 foot register. The height of this pipe from the level of the lower lip to the extreme

top of the pipe is 94.25 inches. The diameter at the mouth for this pipe is 3.25 inches, that is to say, the length of the pipe is twenty-nine times its diameter at the mouth. Applying the proportions heretofore given, the diameter of this pipe at its top is 2.6 inches, and its largest diameter at the middle is 3.9 inches.

The heights of the remaining pipes of the stop follow the usual rule governing the pitch of the pipes, that is to say, each pipe is one-half the height of the octave below.

The diameters of the pipes do not vary in the same proportion as do their heights. Taking any given pipe as unity, the nineteenth pipe counting from it has half its diameter, that is to say, if CC is 3.25 inches in diameter, then the nineteenth pipe counting from it, namely, F sharp, is 1.625 inches in diameter. In this count it is to be noted that both the first and last pipes are to be recognized. The intermediate pipes vary in diameter in regular geometric progression.

The proportions of each pipe, as based upon the diameter of its mouth as heretofore given, should be followed in all pipes of the stop.

The proportions which have been given, if exactly followed, will produce a set of pipes giving the desired quality of tone. It is not, however, to be inferred that there can be no departure whatever from these proportions, since they may be varied within limits without destroying the tone quality.

The mechanical construction of the cup E, possesses mechanical novelty and advantage. The cup is made of the same metal as the pipe, and it has a closed bottom and peripheral walls all in one piece of metal. The bottom is flat, as is likewise the front *i*. The cylindrical portion *m*, of the cup fits snugly within the pipe and is conveniently secured in place by soldering. The top of the cup is entirely open, and the languid D, is conveniently secured in place by soldering to the top of the front wall *i*, of the cup. The cup fits snugly within the pipe so that wind can only pass through the throat *f*, between its front wall and the external body of the pipe at the front.

The cup constitutes the bottom of the pipe and is below the mouth with its upper open end at the level of the bottom of the mouth and with its bottom a distance below the mouth substantially equal to the diameter of the top of the pipe.

I claim as my invention:

1. A metallic organ pipe open at its top and having a mouth and characterized by having a body the diameter of which at the top is smaller than the major diameter in the plane of the mouth, and the diameter of which at the middle is larger than said major diameter at its mouth.

2. A metallic organ pipe having a mouth

and characterized by having its top approximately one-fifth smaller in diameter than it is at the major diameter in the plane of the mouth, by having its middle approximately one-fifth larger in diameter than it is at said major diameter at its mouth, and by diverging gradually from the mouth to the middle and by converging gradually from the middle to the top.

3. A metallic organ pipe characterized by having its upper and lower lips beveled at their outer faces to a sharp edge, having a languid beveled at its front to a sharp edge, the bottom of said languid being at substantially the level of the top of the lower lip, and said pipe having a draft bridge in front of the lower portion of the mouth.

4. A metallic organ pipe characterized by having a mouth the width of which is approximately one-fifth the circumference of the pipe at the mouth, and the height of which is approximately two-sevenths of its width, and a draft bridge in front of the lower portion of the mouth whose diameter is substantially four-fifths the height of the mouth.

5. A metallic organ pipe having a windway, a mouth, and a metallic cup open at its top, closed at its bottom, and fitting closely within the pipe, said cup constituting the bottom of the pipe and having its open top at said mouth, a throat being left between the front of the cup and the front of the pipe for the passage of wind to the windway.

6. An open top metallic organ pipe having a mouth, a windway, a languid, and a draft bridge, and characterized by the following features, namely, (a) its top is approximately one-fifth smaller in diameter than it is at its major diameter in the plane of the mouth, its middle is approximately one-fifth larger in diameter than it is at said major diameter at its mouth, it diverges gradually from the mouth to the middle, and it converges gradually from its middle to its top; (b) it has a cup with its bottom below the mouth a distance substantially equal to the diameter of its top; (c) the upper and lower lips at its mouth are each beveled to a sharp edge, and its languid is beveled to a sharp edge; (d) the width of its mouth is approximately one-fifth the circumference of the pipe at the mouth, and the height of the mouth is approximately two-sevenths of its width; and (e) its draft bridge is in front of the lower portion of the mouth and has a diameter substantially four-fifths the height of the mouth.

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

WILLIAM E. HASKELL.

Witnesses:

F. O. ADAMS,

C. L. STICKNEY.