(No Model.)

W. T. F. WEIGLE.

ORGAN PIPE.

No. 520,344. Patented May 22, 1894.

Fig. 4.

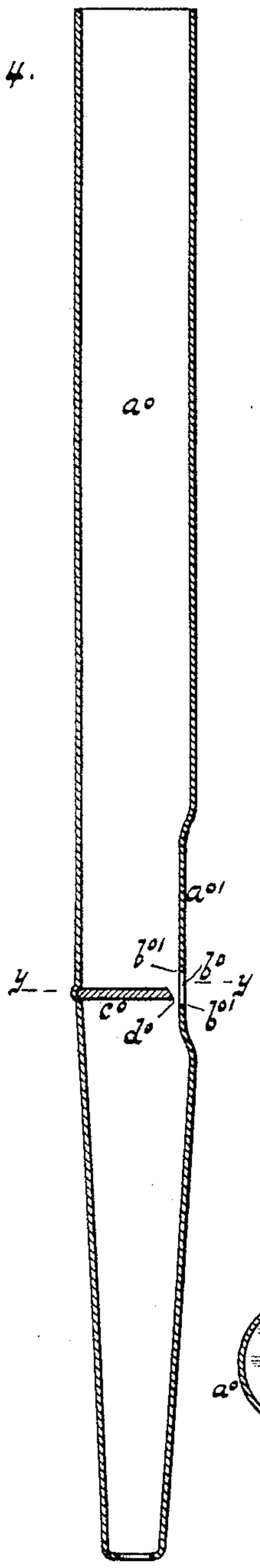


Fig. 1.

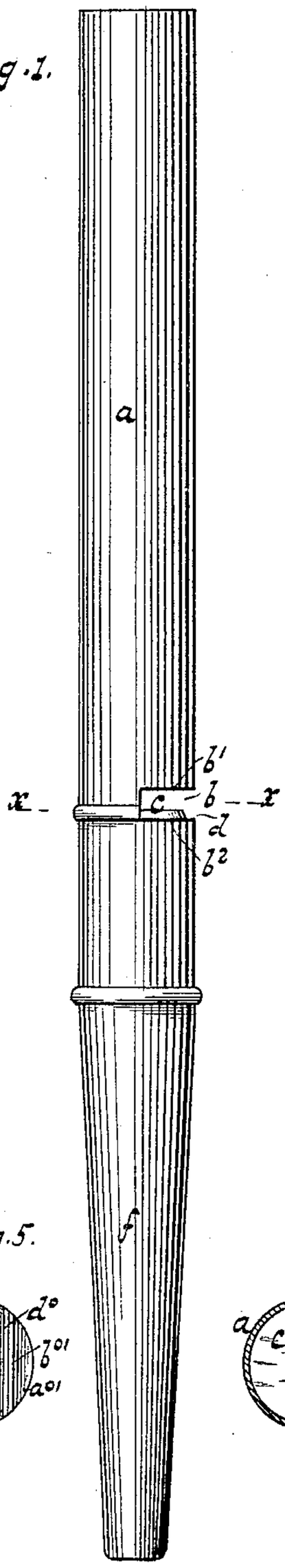


Fig. 2.

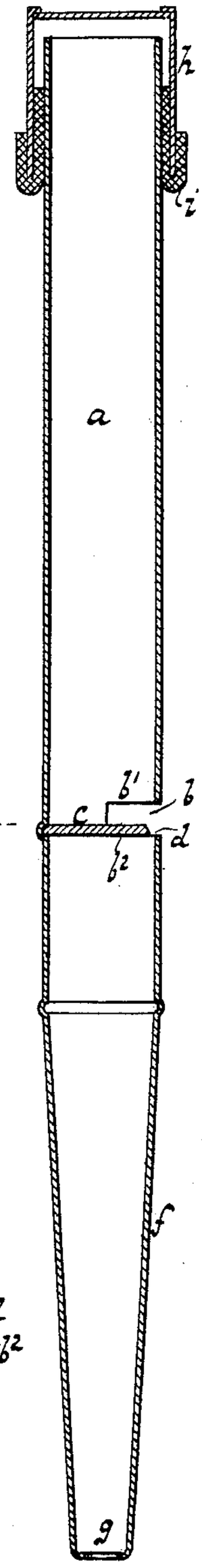


Fig. 5.

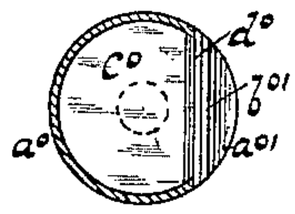
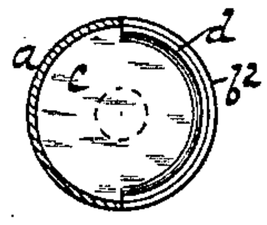


Fig. 3.



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WILHELM THEODOR FRIEDRICH WEIGLE, OF STUTTGART, GERMANY.

ORGAN-PIPE.

SPECIFICATION forming part of Letters Patent No. 520,344, dated May 22, 1894.

Application filed March 8, 1894. Serial No. 502,849. (No model.) Patented in Germany July 30, 1893, No. 74,674, and in England September 20, 1893, No. 17,718.

To all whom it may concern:

Be it known that I, WILHELM THEODOR FRIEDRICH WEIGLE, organ-builder, a subject of the King of Würtemberg, residing at Stuttgart, in the Kingdom of Würtemberg, Germany, have invented a new and useful Improvement in Organ-Pipes, (for which I have obtained a patent in Germany, dated July 30, 1893, No. 74,674, and in Great Britain and Ireland, September 20, 1893, No. 17,718,) of which the following is a specification.

My invention relates to labial organ pipes, the object being to confer upon large church and concert organs, especially as regards their solo stops, that strength of tone and quality of timbre which is expected from such instruments in very large spaces.

The new construction of my labial organ pipe is fully explained in the following specification and claims and illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of a labial organ pipe constructed according to my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a cross section in the direction of the line *x x* in Figs. 1 and 2. Fig. 4 is a longitudinal section of a labial pipe of the old construction. Fig. 5 is a cross section of the same on the line *y y* of Fig. 4.

Hitherto it has been sought to obtain the required strength of tone in large instruments by providing them with from eighty to one hundred and twenty stops, that is to say, by increasing the number of pipes as much as possible. Instruments so constructed, however, require a large amount of space and the tone-effects obtained bear no manner of proportion to the expense incurred in their erection. Moreover, the characteristic timbre of the stops is too weak to produce a fine effect in a large building with such organs. Nor is the required strength of tone obtained by reinforcing the stops by combining with them other even if similar stops, on the contrary the effect is disadvantageous inasmuch as the characteristic timbre is thereby concealed and rendered undecided.

The tone of an organ is no doubt strengthened to some extent by increasing the number of stops, that is to say, the number of pipes to each note, because the effect of the simultaneous sounding of a number of pipes is to set a larger volume of air in sympathetic vibration, so that the tone acts upon the ear more strongly although its amplitude (intensity) is thereby in no way increased. This method of reinforcing the tone does not, however, suffice for large spaces and is, as has already been remarked very expensive. The immediate question then, one which several organ builders had attempted to solve, was how to increase, by the use of air at a pressure considerably higher than that usually employed, the tone of single pipes, or stops. This has up to now only been successfully accomplished in the reed stops of the organ. As regards the labial pipes on the other hand, it has not been possible in their present form, to feed them with air at a pressure much above that usually employed, since, when the pressure is increased, the tone loses its precision, and becomes in the highest degree unmusical and disagreeable, or the pipes may even refuse to speak at all.

By means of the new labial organ pipe hereinafter described with reference to the accompanying drawings, it is possible to produce a labial pipe tone of extraordinarily beautiful timbre, and with a tone strength of any desired intensity. In order to obtain any desired strength of tone from this new high pressure air labial pipe, it is only necessary to increase the pressure of the air to a corresponding extent. By this means it is possible to construct instruments for large buildings with half the number of stops, and so with half the number of pipes but with equal, indeed greater strength and fullness of tone. This is done, in the case for instance of an instrument which to be of adequate power, would require to be built with about a hundred stops, by constructing it with about forty stops of the ordinary kind, and in addition with about ten high pressure stops. Such an organ will cost but little more than half as much as an organ built according to the usual plan and will occupy considerably less space.

In the drawings the letter *a* designates the cylindrical body of the pipe which according to my invention is provided with a segmental cut or opening *b* at the mouth (see Figs. 1 to 3) said opening being equal in height to about

one fourth of the diameter of the body. In the example shown in the drawings (Fig. 3) the segmental opening *b* embraces an arc of one hundred and eighty degrees but I do not wish to confine myself to this exact number of degrees, since the object of my invention can be attained by a segmental opening embracing an arc of less or more than one hundred and eighty degrees. Of course the upper and lower edges of the opening *b* which form the lips b' b^2 of the pipe are also segmental in form. The block or tongue *c* of the pipe forms at its front edge a segmental air space or throat *d* which embraces an arc equal to the arc of the segmental opening *b* (see Fig. 3). The rear portion of the tongue *c* is firmly soldered to the prolongation of the foot *f*, the lower end *g* of the latter being inserted into the opening of a wind channel.

The pipe may be furnished at its upper end with a cover *h* which closes the pipe by means of a packing *i* whereby the open pipe is converted into a stopped pipe.

As shown in the drawings my new high pressure labial pipe differs from a labial pipe of the old form shown in Fig. 4 by the form of the mouth and also by the form of the block or tongue placed therein. In the labial pipes hitherto in use both the upper and the lower lips $b^{0\prime}$ b^{02} are rectilinear, the body a^0 of the pipe having been pressed in to form a flat surface $a^{0\prime}$ and the air space or throat d^0 (Fig. 4) between the lower lip b^{02} and the front edge of the block or tongue c^0 is also rectilinear (Fig. 5).

My improved organ pipes have the very important property of giving with the ordinary organ air pressure of 80° (80° equals eighty millimeters of water pressure) a stronger and more musical tone than those at present in use. The most valuable property of the new pipes, however, is due to the fact, that at all pressures of air, even the highest, they give a tone corresponding in strength to the pressure and at the same time grand and musical, the quality of the tone being controlled by the diameter of the body of the pipe which may vary.

By means of my pipes it is possible to obtain tones which without any detraction from their quality are from twenty to thirty times stronger than the tones which can be produced by the labial pipes of the old construction.

What I claim as new, and desire to secure by Letters Patent, is—

1. A labial organ pipe provided with a segmental opening *b* and correspondingly segmental lips, a tongue *c* with a segmental front edge and a segmental throat *d* substantially as described.

2. A labial organ pipe provided with a segmental opening *b* and correspondingly segmental lips, a tongue *c* with a segmental front edge concentric with the lower lip of the opening *b* and a segmental throat *d* substantially as described.

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

WILHELM THEODOR FRIEDRICH WEIGLE.

Witnesses:

AUGUST H. SCHMIDT,

GUSTAV BRANN.