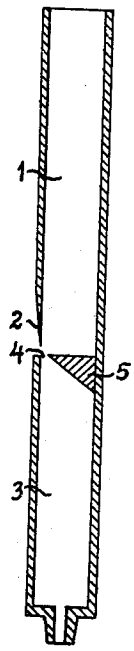
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ACOUSTICAL OSCILLATOR, PRINCIPALLY ORGAN PIPE

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ACOUSTICAL OSCILLATOR, PRINCIPALLY ORGAN PIPE

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1 Claim. (Cl. 84—349)

The present invention refers to the class of acoustical oscillators which consists of a resonator formed principally as a tube in which standing waves can be caused by an air current flowing through a mouth-piece so as to strike the lip or tongue (labial or reed) at one end of the resonator.

In former acoustical oscillators of similar kind, the mouth-piece has exclusively served the purpose of leading the air current to the lip or tongue of the resonator.

This invention involves the formation of the mouth-piece in such a way that it acts as a resonator the resonance frequency of which in proportion to the resonance frequency of the real resonator is 3:2 or about 3:2. Experiments in connection with the invention have indicated that sounds can thus be produced of exceptional strength as compared with the amount of energy contained in and carried by the air current, and, further, of quite equisite timbre which is principally remarkable because it produces an aural impression of purity, and if several concordant sounds are produced simultaneously by means of several acoustical oscillators in accordance with the invention the different sounds are found to blend well with one another.

The best effect is obtained if the proportion between the resonance frequency of the mouth-piece and that of the resonator has the above mentioned ratio 3:2, but experiments have proved that the effect intended to be produced by the invention can also be obtained quite well, even if this proportion is somewhat above or below this value.

An entirely satisfactory theoretical explanation of the effect obtained does not exist, but it should be noted that it is not likely that the effect is caused exclusively by the character of the overtones and combination tones caused by the addition of the chamber of resonance, the resonance frequency of which is 3/2 times the frequency of the fundamental tone.

It is rather assumed that the effect is partly caused by the special condition of movements of the air molecules which are created round the lip or tongue of the resonator.

The invention is chiefly of importance to organ pipes. The drawing indicates an example of its application to a flue pipe in accordance with the invention.

1 is the resonator of the organ pipe formed principally as a tube, the length and kind (open or stopped) of which determines the pitch which is the frequency of the fundamental tone. 2 is a tone producing labial of known construction. Through the mouth-piece 3 of the organ pipe an air current or wind is forced through a small aperture 4 which is formed by the insertion of a block 5 in the organ pipe. By these means standing waves are excited in the resonator 1.

According to the invention the mouth-piece 3 is now so constructed that it forms a resonator, the resonance frequency of which is 3/2 times the resonance frequency of the resonator 1. In the form as shown, the resonator 1 is open, and the length of the mouth-piece must therefore be about 2/3 the length of the resonator 1.

The invention may also be applied to stopped flue pipes in which case, assuming an open and a stopped pipe of the same pitch, the length of the mouth-piece of the stopped pipe must equal the length of the mouth-piece of the open organ pipe.

The same refers to the reed pipes (open or stopped) and to all other acoustical oscillators, the production of sound occurs in a similar way.

What is claimed is:

An acoustical oscillator of the type of an organ pipe comprising a fundamental oscillation resonator, a mouth piece acting as an auxiliary oscillation resonator, and an oscillation producing means therebetween, the resonance frequencies of the fundamental oscillation resonator and the auxiliary oscillation resonator being substantially in the proportion of 2:3.

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