

# PATENT SPECIFICATION



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## PROVISIONAL SPECIFICATION.

### Apparatus for Organ Tone Production.

I, JOHN HAYWOOD COMPTON (British), of 24A, Turnham Green Terrace, Chiswick, London, W. 4, do hereby declare the nature of this invention to be as follows:—

This invention consists of apparatus for producing, in an organ, sounds such as are usually associated with large and costly pipes, such apparatus being very compact in form and readily accommodated in situations where there is sufficient space for bass pipes of known construction.

It comprises essentially an acoustic chest or chamber which may be of spherical, cylindrical, cubic or other convenient form, but differing from bass organ pipes of ordinary construction in the fact that its length is less than its girth, and in other features which I will mention hereinafter; means for varying the acoustic frequency of the said chest through a range of two or more notes of the musical scale; and means for exciting periodic movements of the body of air within the chamber, the said means being under the control of the performer.

A chest such as I use for this purpose has acoustical peculiarities distinguishing it from any organ pipe of known form. An important distinguishing feature is that the mouth or vibrator, or other means for setting the enclosed body of air into vibration may, without detriment to its efficiency, be situated at any convenient point on any wall of the chest, and not necessarily at or near one end as in an organ pipe; another is that the pitch of the musical note produced may be raised by making an aperture or apertures in any one or more of the walls of the chest and at any convenient point or points, without detrimentally affecting the tone quality or volume, whereas in an ordinary pipe any apertures

employed for such purpose must necessarily be at or near the upper end, that is, the end more distant from the mouth or vibrator. A further difference to be noted is that the body of air within a chest of this description vibrates always at its fundamental frequency, whereas even the widest labial pipes of normal construction are apt to sound their octave or twelfth if overblown.

The means for exciting vibrations may be an air-reed formed at a labial opening or mouth as in an organ flue pipe. The apertures for varying the pitch may be fitted with air-tight doors adapted to be opened and closed by pneumatic or electric or other suitable means of known construction. The said doors may be coupled with the means for exciting vibration in such manner as to operate in suitable conjunction therewith, or they may be controlled independently.

An acoustic chest of the kind I have described, having a capacity of about twenty four cubic feet, may, by suitably adjusting its vibrating means and the size of its aperture or apertures, be tuned to sound the note CCC, of 16 ft. pitch, with an intensity of tone equal to that of an ordinary large scaled pedal open bass. If its vibrator is an air-reed, the pitch of the note may be raised to CCC sharp by uncovering an aperture of about six square inches in any one of the walls of the chest. By progressively uncovering additional apertures of suitable sizes six, eight, or even more notes of the scale may be produced in succession, as the air-reed is capable of adjusting itself, within fairly wide limits, to the vibration frequency of its associated air column.

Dated this 21st day of May, 1925.

JOHN HAYWOOD COMPTON.

## COMPLETE SPECIFICATION.

## Apparatus for Organ Tone Production.

I, JOHN HAYWOOD COMPTON (British), of 24A, Turnham Green Terrace, Chiswick, London, W. 4, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to apparatus for organ tone production and the object of the invention is to enable sounds such as are usually associated with large and costly pipes to be produced by means of apparatus which is very compact in form and readily accommodated in situations where there is not sufficient space for bass pipes of known construction.

Stopped pipes and semi-stopped pipes (i.e. pipes with "chimneys" or perforated stoppers) for organs have been fitted with doors covering apertures and controlled by the organist for varying the pitch of the pipe, and producing from it two or more notes of the musical scale, but these apertures and doors had to be placed in or at the end of a tube or long passage communicating with the interior of the pipe, otherwise the pipe would not speak properly with the aperture open.

It has also been proposed to construct a pedal organ with one pipe only, the pipe being of suitable size and provided with side apertures covered with valves, the apertures being at such distances apart as will cause the pipe to emit the complete gamut of sound when the apertures are uncovered in succession. The pipe might be provided with an end cover which could be opened or closed to enable the normal pitch to be lowered an octave.

The desired result however cannot be obtained if the pipe is a stopped or semi-stopped one, except with the use of the additional tubes or long passages above referred to, unless the pipe is made of the right dimensions; and these dimensions so far as I am aware have not hitherto been disclosed.

I have found that if a stopped or semi-stopped pipe is made of squat formation, i.e. sufficiently short and with the cross sectional area correspondingly increased (the length of the pipe being preferably less than its girth), an aperture or apertures furnished with doors under the control of the organist, may be placed at any convenient point or

points in the top, bottom or sides of the pipe, and may be used for varying correctly the pitch of the pipe, and so producing a series of notes at semitonal or tonal intervals of the musical scale, without it being necessary to employ internal or external tubes or long passages such as have heretofore been found necessary in connection with such pitch varying means.

In defining my invention, I use the word pipe to cover generally a note emitting chamber of any convenient form whether spherical, cylindrical, rectangular or of other form and the means I prefer to employ for setting the enclosed body of air in vibration is an air reed.

The invention accordingly consists in a stopped or semi-stopped pipe for organs, of squat formation, preferably of a length less than its girth, having an aperture or apertures adapted to be opened or closed by doors under the control of the organist, and so to vary the pitch of the pipe, and to produce a series of notes at semitonal or tonal intervals of the musical scale, without the pipe being provided with internal or external tubes or air passages connecting with said apertures or doors.

The invention is illustrated in the accompanying drawing, showing in vertical section a pipe of cubic form to which the invention is applied.

The chamber *a* has a mouth *b* at which is formed an air reed supplied from the wind trunk *c*. Apertures *d*, *e*, *f*, *g*, *h* of varying sizes are formed in the sides and top of the chamber *a*, and are adapted to be closed or opened by doors *d*<sup>1</sup>, *e*<sup>1</sup>, *f*<sup>1</sup>, *g*<sup>1</sup>, *h*<sup>1</sup> under the control of the organist through pneumatic, electric or other suitable means. The said doors may be coupled with the means for exciting vibration in such manner as to operate in suitable conjunction therewith, or they may be controlled independently. Any one of the apertures may be opened independently of the others, or two or more may be opened simultaneously. The note given by the pipe will be raised if aperture *d* is opened; it will be raised further if aperture *e*, which is larger, be opened instead of *d*; and still further if *d* and *e* are opened simultaneously, and so on.

I have found for example that an

5 acoustic chest or pipe of the kind I have described, having a capacity of about twenty four cubic feet, may, by suitably adjusting its vibrating means and the size of its aperture or apertures, be tuned to sound the note CCC, of 16 ft. pitch with an intensity of tone equal to that of an ordinary large scaled pedal open bass. If its vibrator is an air-reed, the pitch of the note may be raised to CCC sharp by 10 uncovering an aperture of about six square inches in any one of the walls of the chest. By progressively uncovering additional apertures of suitable sizes six, 15 eight, or even more notes of the scale may be produced in succession, as the air-reed is capable of adjusting itself, within fairly wide limits, to the vibration frequency of its associated air column. 20

In an apparatus of the kind described the mouth or vibrator, or other means for setting the enclosed body of air into vibration, may without detriment to its efficiency be situated at any convenient point on any wall of the chest, and not necessarily at or near the lower end as in ordinary organ pipes; another distinguishing feature is that the pitch of the musical note produced may be raised by making an aperture or apertures in any one or more of the walls of the chest and at any convenient point or points, without detrimentally affecting the tone quality or volume, whereas in an ordinary pipe any aperture employed

for such purpose must necessarily be at or near the upper end, that is, the end more distant from the mouth or vibrator. A further difference to be noted is that the body of air within a chest of this description vibrates always at fundamental frequency, whereas even the widest labial pipes of normal construction are apt to sound their octave or twelfth if overblown. 40 45

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:— 50

1. Apparatus for organ tone production comprising a stopped or semi-stopped pipe, of squat formation, having an aperture or apertures adapted to be opened or closed by doors under the control of the organist, and so to vary the pitch of the pipe by semitonal or tonal intervals of the musical scale, without the said pipe being provided with internal or external tubes or air passages connecting with said apertures or doors. 55 60

2. Apparatus as claimed in Claim 1, wherein the length of the pipe is less than its girth. 65

Dated this 19th day of January, 1926.

L. N. REDDIE,  
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[This Drawing is a full-size reproduction of the Original.]

