

PATENT SPECIFICATION



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PROVISIONAL SPECIFICATION.

Improvements in or relating to Sound Reproducing Machines.

I, JOHN GEORGE AULSEBROOK KITCHEN, of 7, Rose Bank, Scotforth, Lancaster, in the County of Lancaster, a subject of the King of Great Britain and Ireland, do hereby declare the nature of this invention to be as follows:—

The invention relates to sound reproducing machines of the kind in which means are provided for transmitting the sound waves through a combustible fluid under ignition at a suitable burner.

The invention consists in improvements in such means, the object of the improvements being to increase the efficiency of the apparatus particularly in tone and loudness and to provide a compact fitting adapted for attachment to the ordinary sound reproducing machines.

In carrying out my invention, the diaphragm of the sound box is enclosed on both sides; on the one side by means of a fluid tight cover as hitherto, and on the other side by means of a cover which provides for freedom of movement of the stylus arm or bar passing therethrough.

On the fluid-tight side of the sound box communication is made with the burner the root or stem of which may be directly connected with the central opening in the sound box or through a flexible pipe.

The cover on the usually exposed side of the sound box has also a central open-

ing round which is secured the neck of a sound deflector or horn arranged to direct the sound waves from this side of the sound box across or alongside the flames of the burner.

The stylus arm or bar passes through an opening in this cover. This opening may be made air tight by means of a flexible sleeve surrounding the said arm and secured in a suitable manner say to a nozzle round the opening in the cover and round the arm above the securing means of the stylus. This flexible sleeve may be of indiarubber, parchment or other suitable material.

The burner is preferably a vertical one with the flame nozzles above the sound box and may be of the form or construction referred to in the Specification of Letters Patent No. 132,408.

The sound box carrying the burner and the deflector or horn, may be supported at the end of a swivelling arm similar to the tone arm of the ordinary gramophone, or in any other suitable known way, provision being made for counterbalancing the weight of the apparatus to the required degree.

Dated this 20th day of January, 1921.

R. J. URQUHART,
A.M.I.Mech.E., F.Ch.Inst.P.A.,
Agent for the Applicant.

COMPLETE SPECIFICATION.

Improvements in or relating to Sound Reproducing Machines.

I, JOHN GEORGE AULSEBROOK KITCHEN, of 7, Rose Bank, Scotforth, Lancaster, in the County of Lancaster, a subject of the King of Great Britain and Ireland, [Price 1/-]

Price 25/-

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 refers to sound reproducing machines of the kind in which means are provided for transmitting the sound waves through a combustible fluid under ignition at suitable burners, and in which the supply of combustible fluid through a chamber to the burner is made intermittent by means of a body vibrating between two opposite outlets from the chamber.

In my improved apparatus, which is adaptable to the ordinary gramophone, and can be made as an attachment thereto, the vibrating body consists of a diaphragm transversely dividing the sound box into two separate portions so that the vibrations due to each side of the diaphragm are transmitted to the sound emitting devices which consist either of burners of suitable character or of such burners and a resonant horn, the vibrations from both sides of the diaphragm being transmitted through a combustible fluid such as coal gas in contact with the diaphragm, to the burner nozzles, or those from the one side of the diaphragm being transmitted in a similar manner to burner nozzles, and those from the other side in the ordinary way to a resonant horn facing the burners.

The object of the present invention is to increase the efficiency of the apparatus particularly in tone and loudness and to provide a compact fitting adapted for attachment to the ordinary sound reproducing machines.

In the drawings attached hereunto, which show how the improved apparatus may be constructed, Figure 1 represents a side elevation with two groups of burners, and Figure 2 an end elevation of the burners and sound box. Figure 3 represents an end elevation of a modification in which there is a burner or group of burners at one side of the sound box and a resonant horn at the other. Figure 4 represents a side elevation of this arrangement. Figure 5 represents a sectional elevation of the improved sound box.

Referring to Figures 1, 2 and 5 of the drawings, the sound box is represented by 1 and is shown in section in Figure 5. Both sides of the diaphragm 2 are provided with covers 3 and 4, the cover 4 on the stylus arm side being slotted to permit the arm to vibrate. In some cases

there is a gas tight joint between the cover 4 and the stylus arm 5, and such a joint is shown in Figure 5. In order to facilitate assembly, the arm 5 is in two parts, the upper part terminating at 6 in a socket and secured by the screw 7, the socket part 8 forming one member of the joint 9 and stylus socket 10. Over a nozzle 11 formed round the opening for the stylus arm to protrude from the cover 4, and the upper part of the socket 8, is secured a thin flexible tube 12 of say parchment, by means of binders 13.

To the nozzles 14 and 15 of the sound box, are secured the burners 16 and 17, preferably with a ground spigot joint at 18, so that each can be quickly detached for cleaning purposes.

The burner sound emitting device shown, consists of three vertical tubular members fixed to a base and is made in accordance with the Specification of Letters Patent No. 132,408, the burner nozzles consisting of fine holes pierced a short distance apart in two rows which are preferably less than one hundred and eighty degrees apart in order to reduce the tendency of the members to overheat. The swivel arm 19 carrying the sound box and burners, is shown longitudinally adjustable, and the overhanging weight is counterbalanced to the required degree by means of the spring 20 in the known way.

The universal joint of the arm 19, is made vertically adjustable on the vertical pivot 21 in the manner shown so as to provide for differences in height of the turntables of different makes of machines, and this vertical pivot is supported in the standard 22 which is adapted for securing to the cabinet top of the machine by means of wood screws.

To the standard 22 is fixed a gas tap 23 with a nozzle 24 on the outside for the attachment of the gas supply pipe, and a branched nozzle 25 on the inside.

At the base of each burner is provided another small nozzle 26, these and the branched nozzles being connected together by means of small bore flexible tubes 27, preferably of indiarubber.

A resonator such as that shown at 28 may be employed and mounted in any suitable known way.

In the apparatus above described and illustrated, all vibrations due to the movement of the stylus over the record, are carried to the burner nozzles, and being all of similar quality in tone, the maximum efficiency of the sound box is obtained with this system.

Referring now to the modification shown by Figures 3 and 4, the sound box 1 has an open slot 29 in the cover 4, the clearance being as small as possible though a gas-tight connection is not necessary. To this cover is secured a resonant horn 30 opposite to the burner 16 which has three nozzle members. The branch nozzle 25 is replaced with a single one and only one flexible pipe is needed between the tap 23 and the sound box.

In this modified apparatus, the sound vibrations of the stylus arm side of the diaphragm, are directed into the horn 30 and towards or across the burner 16, while those of the front side of the diaphragm are directed to the burner. The burner may alternatively be attached to the cover of the stylus side of the diaphragm, the horn being attached to the cover of the front side of the diaphragm. The sound box fitted with a gas tight joint round the stylus arm, may be employed instead of that shown in Figures 3 and 4.

The horn 30 acts as a resonator to the burner 16.

I am aware that in sound recording and reproducing apparatus of a type other than that to which this invention relates, but in which both surfaces of a diaphragm are simultaneously employed, it has been proposed to provide a single bent stylus arm carried through a slot in one of the sound outlets.

Having now particularly described and ascertained the nature of my said inven-

tion and in what manner the same is to be performed, I declare that what I claim is:—

1. In sound reproducing machines of the kind referred to, the improved construction herein described, wherein the vibrating body consists of a diaphragm transversely dividing the sound box into two separate portions so that the sound waves produced on both sides of the sound box diaphragm can be transmitted through the fluid to the sound emitting devices actuated thereby.

2. In apparatus as claimed in Claim 1, connecting one chamber of the sound box to a burner device and the other chamber to a resonant horn device the mouth of which directly faces the burner device with a suitable distance between.

3. In combination with the constructive arrangement claimed in Claim 1, the radially and vertically adjustable swivel arm carried by a standard adapted for easy attachment to the cabinet of the machine, substantially as described with reference to Figure I of the drawings.

4. Apparatus according to Claim 1 constructed and arranged substantially as herein described and illustrated in the drawings.

Dated this 19th day of October, 1921.

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[This Drawing is a reproduction of the Original on a reduced scale.]

