N° 16,015 A.D. 1905

Date of Application, 4th Aug., 1905

Complete Specification Left, 31st Jan., 1906—Accepted, 3rd May, 1906

PROVISIONAL SPECIFICATION.

Improved Construction of Apparatus for Exercising the Lungs and Indicating the Cubic Air Capacity of same.

I, James Sidney Renvoize, of 62 Colverstone Crescent, Dalston, London. Engineer, do hereby declare the nature of this invention to be as follows:—

The object of this invention is to construct an apparatus whereby the lungs of a person can be exercised, and at the same time the cubic air capacity of the lungs can be indicated on a dial, and if necessary, registered or marked on a ticket, and the ticket delivered to the operator, and means may be also provided whereby the number of respirations within a given time and the amount of air expended from or draw into the lungs may be indicated and registered.

For the purpose of my invention, I form a box or casing and within same I fit therein a fan, screw, vane or other like revolving appliance, and gear same with a train of clockwork leading to a duplex finger or pointer arranged in front of a dial. A flexible tube having a mouthpiece is fitted to the box or casing, and in proximity to the fan, and other openings being provided in the box for admission or egress of air.

On blowing into the tube, the pointer will be actuated and moved to a distance indicating the cubical quantity of air ejected from the lungs and will stay in that position until air is drawn into the lungs, when the pointer will be returned and indicate the amount of air drawn into the lungs, one pointer indicating on one index the blowing capacity, and the other pointer indicating on another index the drawing in capacity.

In some cases and especially for use in inhaling chemicals, I form a compartment in the casing and provide same with a hole having a non-return or sluice valve the chamber containing a chemical, the fumes or odour from which, is during inhalation, drawn through the valve and inhaled by the person.

The outlets from the box or casing may be in pairs in which case I provide each with a non-return valve, so that the air drawn in through one must be ejected through the other, thus preventing contamination.

On each side of the fan I may arrange a perforated disc, so that the air in passing through will rapidly act upon the fan by reason of the air being divided into small streams, thus efficiently revolve the fan without fear of the air being drawn through in bulk without properly moving the fan, thus ensuring its sensitiveness.

Any system of ticket printing may be adopted for recording the blowing and indrawing capacity of the operator, and such ticket can be delivered to the operator, the system being either performed through mechanism operated by train of gear or by separate mechanism operated separately by the operator, or by mechanism operated by clockwork mechanism released for operation when the operator first actuates the screw or fan.

The apparatus can be employed with coin freed mechanism so that such apparatus can only be operated after the insertion of a coin.

When the apparatus is constructed for time measurement, the screw or fan is braked by the clock mechanism or some of the train of gear can be lifted out of action at the end of the predetermined period of time; thus an operator

[*Price 8d.*]

can indicate and record the number of respirations and the cubical capacity air employed within a given period, say one minute.

Dated this 4th day of August 1905.

R. CORE GARDNER,
Chartered Patent Agent,
173, 174 & 175 Fleet Street, London, E.C.
Agent for the said:—James Sidney Renvoize.

COMPLETE SPECIFICATION.

Improved Construction of Apparatus for Exercising the Lungs and Indicating the Cubic Air Capacity of same.

I, JAMES SIDNEY RENVOIZE, of 62 Colverstone Crescent, Dalston, London. Engineer, 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:—

The object of this invention is to construct an apparatus whereby the lungs of a person can be exercised and at the same time the cubic air capacity of the lungs expended into the apparatus or indrawn therefrom can be indicated on a dial.

My invention will be clearly understood from the following description aided by the accompanying drawings in which:—

Figure 1. is a part sectional elevation of an apparatus.

Figure 2. a plan of the apparatus, and

Figure 3. a side section of the apparatus.

1 is the box or casing containing the mechanism.

2 is a hollow casting of metal having openings in four directions and held to the casing 1 by a screw 3.

The front opening 4 of the casting 2 is of circular or tube like shape and carries a thimble 5 having a conical extension 6 projecting from the opening 4, which thimble 5 is held in the opening 4 by a pin 7 or otherwise, and on the extension 6 is placed a flexible tube 8 projecting through a hole 9 in the box 1 and carrying at its end a mouthpiece 10.

Branches 11, 12 are situate on each side of the casting 2 and these carry horn or other shaped extensions 13, 14, each having a non return valve 15, 16, arranged in opposite directions so that in action one is closed whilst the other is open.

The base or bottom 17 of the casting 2 is hollow and rests on the bottom of the box 1, and is shaped to receive a drawer 18 inserted and removed from the side of the casing 1, a slide 19 being situate above the drawer 18 to shut it off from the hollow casting 2.

The thimble 5 has perforations 20 in one end and a central bearing hole for receiving one end of a spindle 21 which carries a fan or vane 22 situate immediately behind the thimble 5, the other end of the spindle 21 passing through the case 1 and a plate 23 attached thereto and having a bearing in a plate 24^a secured by posts 24 to the plate 23. The spindle 21 carries at the end opposite the fan 22 a pinion 25, this meshing with and actuating a train of gear wheels 26, having bearings in the two plates 23, 24^a, the axle 27 of the top gear wheel projecting through the plate 23 and carrying a pointer or indicator 28 in front of a dial 29 fixed to the upper front part of the casing 1.

The axle 27 is provided with a thumb button 30 on its free end and situate outside the casing and a spring 31 encircles the axle 27 between the top gear

wheel and the plate 24^a, stops 32 being provided on the dial to limit the movement of the pointer 28 when indicating.

In Figure 3 the pointer 28 is shown as being free of the pins 32 and therefore capable of movement to test and indicate the cubical capacity of the lungs, but when the axle 27 is pulled back by its knob 30 and held in the pulled back position by placing the catch 33 under the knob, the top gear wheel will be out of mesh with the other part of the train of gear and the machine can be used without any indication of the cubical capacity of the lungs. On the release of the catch, the spring 31 will return the pointer 28 to clear the stops.

34 is a door at the back of the casing 1 to enable a person to get at the mechanism and to remove the screw 3 that the casting 2 can be removed for cleaning purposes by undoing the top or front of the casing 1 so that by removing the tube 8, ferrule 6, thimble 5, the vane 22, horns 13, 14, the casting 2 can be removed and all the parts cleaned and sterilized when required.

On an operator blowing into the apparatus through the mouth piece 10, the breath will pass through the casting 2, revolve the fan 22, and through the train of gear, operate the pointer to indicate the cubical capacity of the lungs, the pressure of the breath closing the valve 15 and opening the valve 16 for the breath to pass to the atmosphere, but on drawing air into the lungs, the suction will close the valve 16 and cause the air to enter through the valve 15, thus the operator sucks pure air into his lungs and not his breath back again.

The box 18 is intended for containing chemicals or giving off fumes or odours, such as eucalyptus, and when the valve is removed, the indrawing of the air will take up the fumes and carry them to the lungs, so that the apparatus can be used as an inhaler as well as a lung tester and exerciser.

The dial bears indications of capacity for both expelling from or indrawing air into the lungs as will be understood by the wording "in" and "out" on the dial.

The apparatus may be employed with coin freed mechanism so that such apparatus can only be operated after the insertion of a coin, and such apparatus can also be employed for time measurement by clockwork mechanism or some of the train of gear can be lifted out of action at the end of a predetermined period of time, thus an operator can indicate and record the number of respirations and the cubical capacity of air employed within a given period of time.

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:—

The improved construction of apparatus for exercising the lungs and indicating the cubic air capacity of same, consisting of a box, containing a casting having four openings, one for connection of a flexible tube, two leading to the atmosphere, and being controlled by non return valves, and the other opening to a box containing chemicals for inhaling purposes, a fan or vane in such casting and operating a train of gear wheels for moving a pointer around a dial on the revolving of the fan in either direction, substantially as described and shown on the accompanying drawings.

Dated this 31 day of January 1906.

R. CORE GARDNER,
Chartered Patent Agent,
173, 174 & 175 Fleet Street, London, E.C.
Agent for the said:—James Sidney Renvoize.

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RENVOIZE'S Complete Specification.

2 SHEETS

SHEET 1.

Fig. 1.

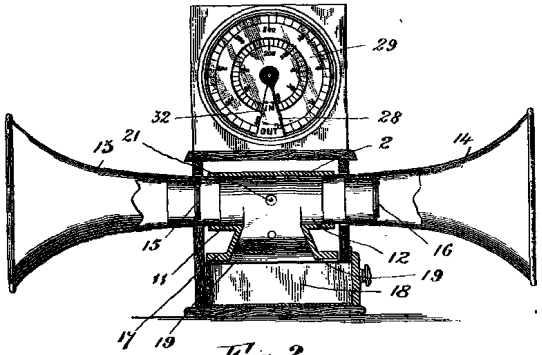
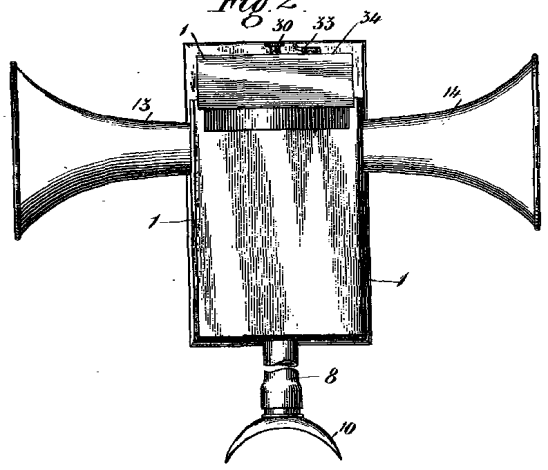
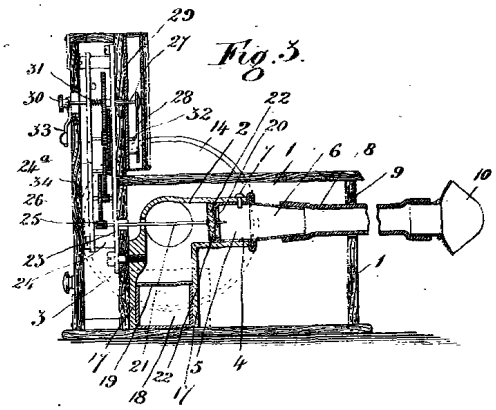


Fig. 2.



SHEET 2.

Fig. 3.



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

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A.D. 1905. Aug. 4. Nº 16,915
RENVOIZE'S Complete Specification.

SHEET 1.

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

Fig. 1.

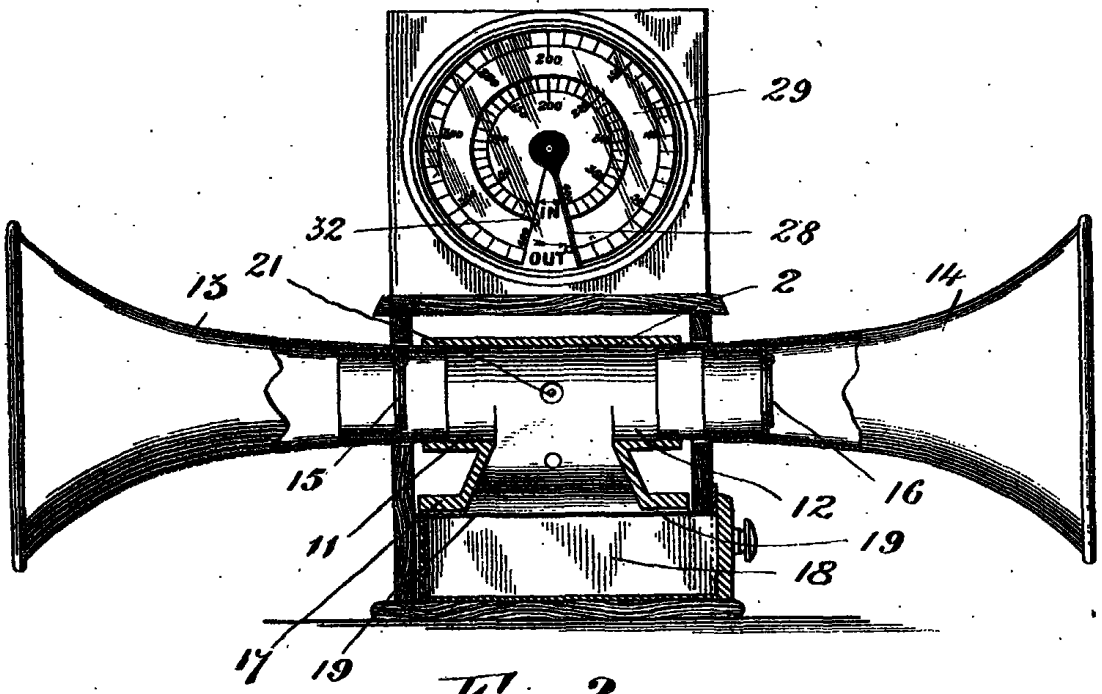
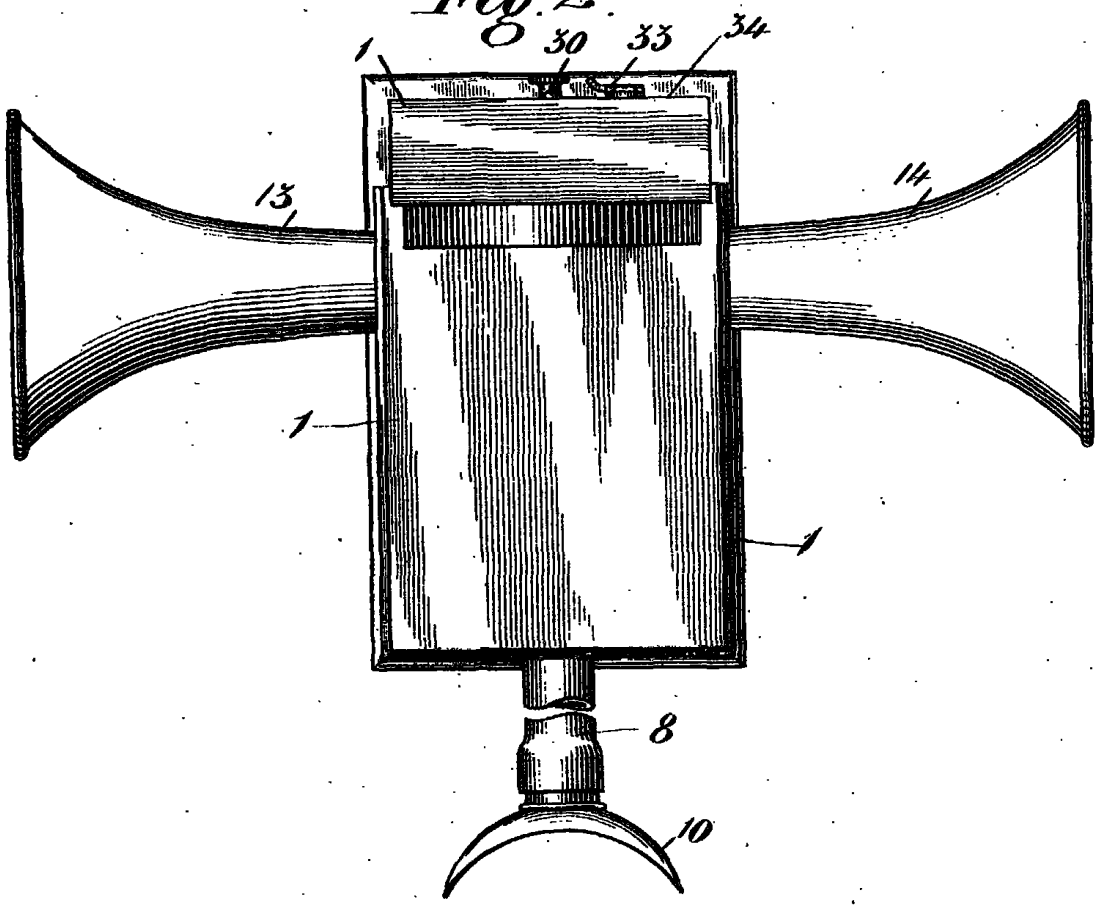


Fig. 2.



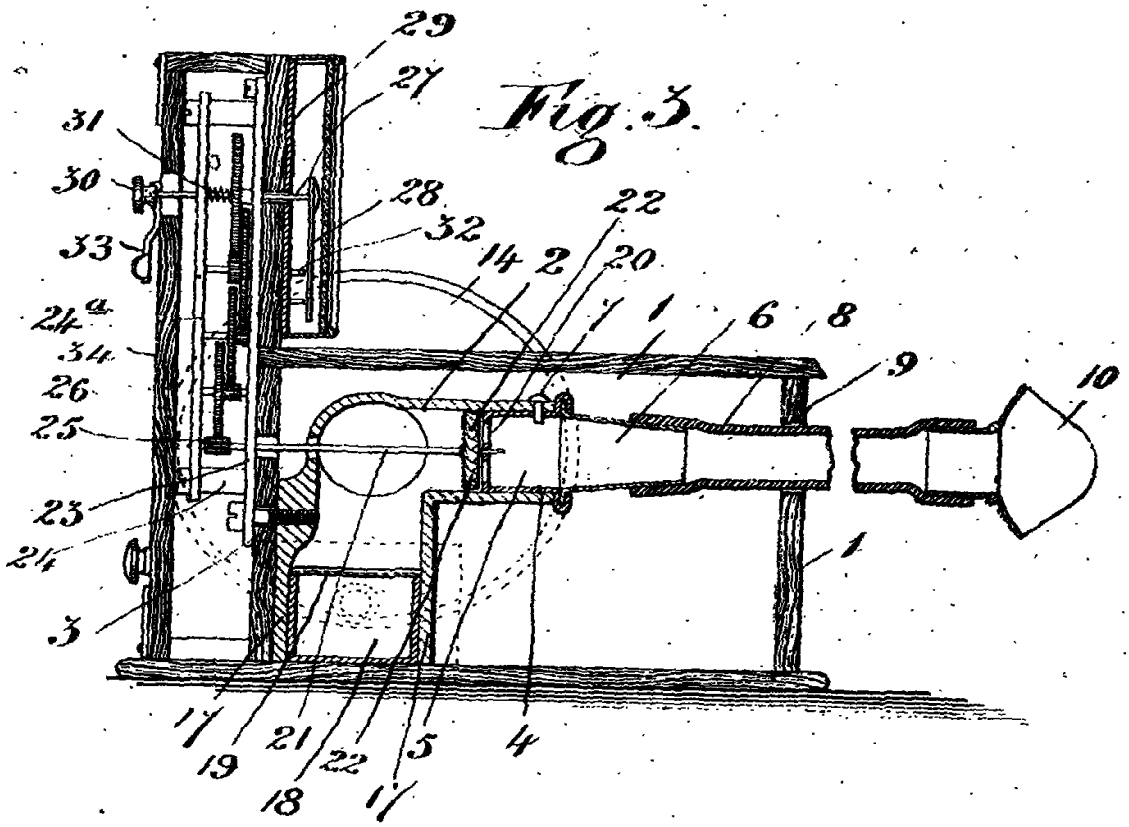


Fig. 3.

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