A pneumometer / [Richard Howson].

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PROVISIONAL SPECIFICATION.

A Pneumometer.

We, RICHARD HOWSON of Southfield Terrace, Middlesbrough on Tees in the County of York, Engineer, and EDWARD CROWE of Grove Hill, Middlesbrough aforesaid, Engineer, do hereby declare the nature of this invention to be as follows :—

It consists of an apparatus for testing the strength of the lungs by means of a pressure gauge with which a pipe with a mouthpiece is connected. So far the construction is of an ordinary and well known character, but it is combined with a mechanism which is new, & which forms the essential of our invention, namely that the gauge will not indicate the pressure except on the introduction of a coin into a slot or receptacle prepared for it.

The manner in which the coin acts is as follows. The blow pipe, or mouthpiece is connected with a small cylinder in which a piston works. Before the coin is introduced, the piston rests on a seat, closing the inlet orifice, & is held there by means of a catch attached to a rocking lever counterweighted at one end. In this condition it is impossible for the air blown into the mouthpiece to act on the gauge. On the other hand, when the coin is introduced, it falls onto the opposite end of the lever, & overbalances the counterweight, by which means the catch is released, the piston rises & allows the air to pass into the gauge, which then indicates the pressure.

In the mean time the coin has to be removed from the end of the lever in order that the apparatus may resume its original position, & this is effected as follows.

When the coin is introduced it rests in the first instance on a shelving plate attached to the lever, but it cannot fall any further because its edge comes in contact with a projecting stop. This stop forms part of another lever which is arranged so that when the piston moves upward, it acts upon that lever & causes the stop to be removed. The coin then falls off the plate. Thus when the operator ceases blowing the piston drops, the counterweight forces the catch again into its place, & the passage to the gauge is locked until a new coin is introduced.

Dated this 9th day of September 1887.

RICHARD HOWSON.
EDWARD CROWE.

[*Price 8d.*]

COMPLETE SPECIFICATION.

A Pneumometer.

We, RICHARD HOWSON, of Southfield Terrace, Middlesbrough-on-Tees, in the County of York, Engineer, and EDWARD CROWE, of Grove Hill, Middlesbrough aforesaid, 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 :—

This invention relates to the construction of an improved pneumometer or apparatus for testing the lungs by means of a pressure gauge actuated through the medium of a mouth piece and blow pipe which are constructed and arranged in the ordinary manner, and this invention consists in arranging in combination therewith certain mechanism which will prevent the gauge with which the apparatus is provided being acted upon until a coin has been introduced into a slot or receptacle provided for its reception.

We will now describe our invention with reference to the accompanying drawings in which the same letters of reference indicate like parts in all the Figures. Figure 1. is a front view of the apparatus, Figure 2. a back view of the same with the back of the case removed and part of the mechanism in section, and Figure 3. is a side view with the side of the case removed and part of the mechanism in section. In the last Figure several parts of the mechanism are removed.

The mechanism constituting the subject of this invention is arranged within a case A. The mouth piece B is connected by the blowing tube *b*. with the cylinder C. in which the piston *d*. is arranged to work freely. In the side of the said cylinder is an air passage *e*. leading to the pressure gauge F. To the upper face of the piston *d*. is attached the spindle d^1 which passes through an aperture in the cover of the cylinder. When the mechanism is in its normal or locked position, the piston *d*. rests on a seat at the bottom of the cylinder, C. and closes the inlet orifice, and it is retained in that position by a catch *g*. which forms part of the rocking lever G. of which g^2 is the pivot. The cover of the cylinder C. is perforated to allow of the escape of any air which may be forced past the said piston when the same is locked, as lastly described. One end of the lever G. is counter-weighted and to the opposite end is attached the shelving plate g^1. The lever H. which is pivoted to the last mentioned end of the lever G. is counter-weighted at one end and is turned up or provided with a projecting stop at the opposite end. The lever H. is so arranged in reference to the spindle d^1 that the latter in its upward movement will come into contact with the weighted end of the said lever and will turn it on its pivot whereby the coin is released, as hereinafter described. I. is the shoot down which the coin passes from the slot in the case A. to the shelving plate g^1.

The action of the mechanism hereinbefore described is as follows :—

When the mechanism is in its normal position the piston *d*. is retained by the catch *g*. against its seat at the lower end of the cylinder C., consequently the air inlet is closed, on a coin being passed through the slot *k*. it slides down the shoot I. on to the

shelving plate g^1 where it is retained, for the time, by the turned up end of the lever H., the weight of the said coin overbalances the counter weight and causes the lever G. to turn on its pivot, whereby the catch g. is disengaged from the end of the spindle d^1. On air being blown through the tube b. the piston d. rises to the top of the cylinder C., closes the perforations therein and opens the passage e. through which the air passes to the gauge. In its upward movement, the spindle d^1 catches the lever H. and, turning it on its pivot, causes the turned up end thereof to be moved from the end of the shelving plate g^1, thus allowing the coin to slide off, the consequence being that on the descent of the piston the lever G. resumes its normal position and again locks the mechanism.

We wish it to be understood that we do not desire to confine this invention to the exact details hereinbefore described as they admit of many modifications, for instance, a flexible diaphragm or a hinged valve may be substituted for the piston d., and springs may be used instead of counterweights. We have hereinbefore referred to the pressure gauge as being an ordinary dial gauge, but, if desired, a mercurial column or any other suitable gauge may be substituted therefor, as will be readily understood.

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

First. In pneumometers or lung testing apparatus, the interposition, between the mouth piece and the indicating gauge, of the cylinder C., piston d., with spindle d^1, and the lever G., with catch g., the whole being constructed and arranged substantially as, and for the purpose hereinbefore described.

Secondly. In pneumometers or lung testing apparatus, the combination and arrangement, in connection with the lever G., of the shelving plate g^1 and lever H., substantially as, and for the purpose, hereinbefore described.

And thirdly. In pneumometers or lung testing apparatus, the interposition, between the mouth piece and the indicating gauge, of the mechanism for preventing the passage of forced air to the gauge until a coin has been inserted into the apparatus, substantially as hereinbefore described.

Dated this 5th day of June 1888.

VAUGHAN & SON,
Agents for the Applicants.

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By DARLING AND SON, LTD.

1888.

Figure 1.

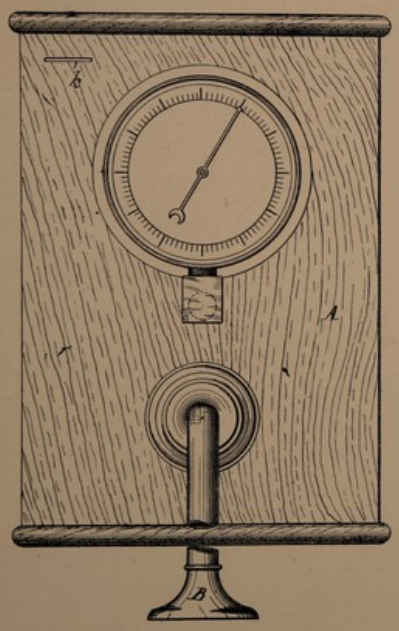


Figure 2.

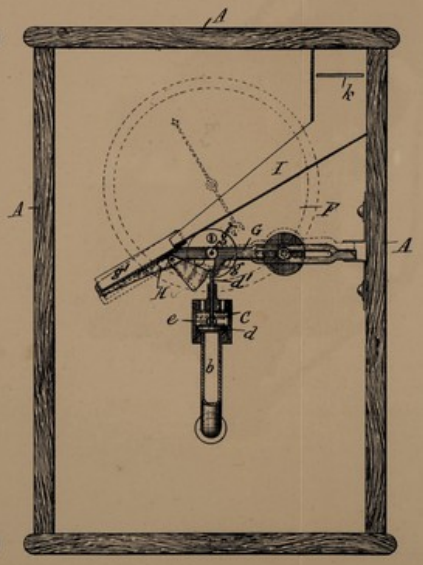
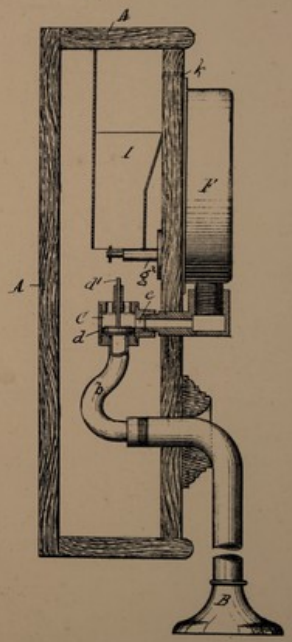


Figure 3.



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