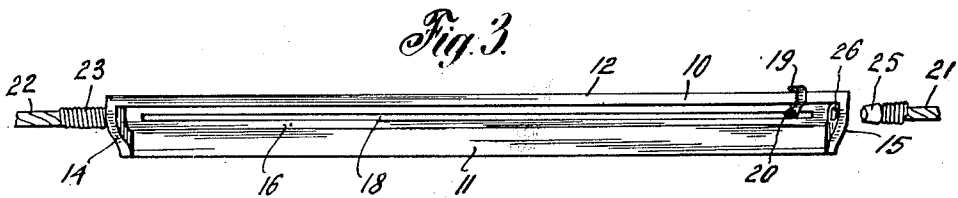
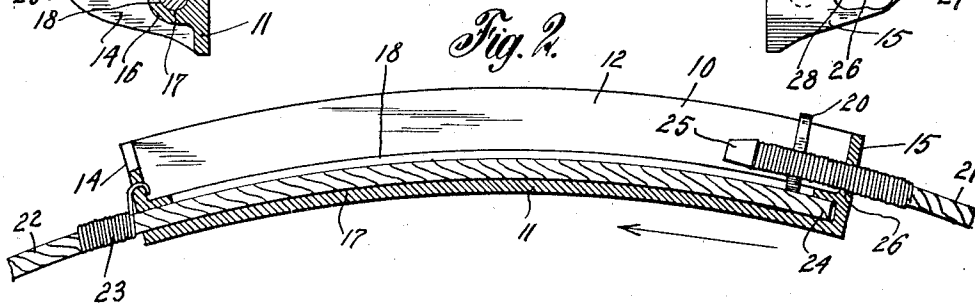
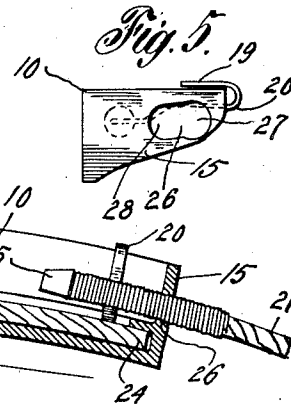
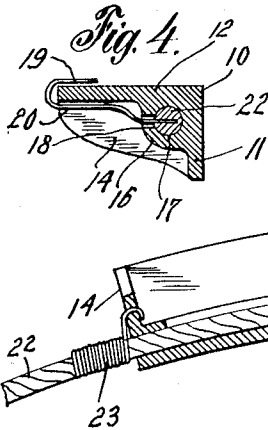
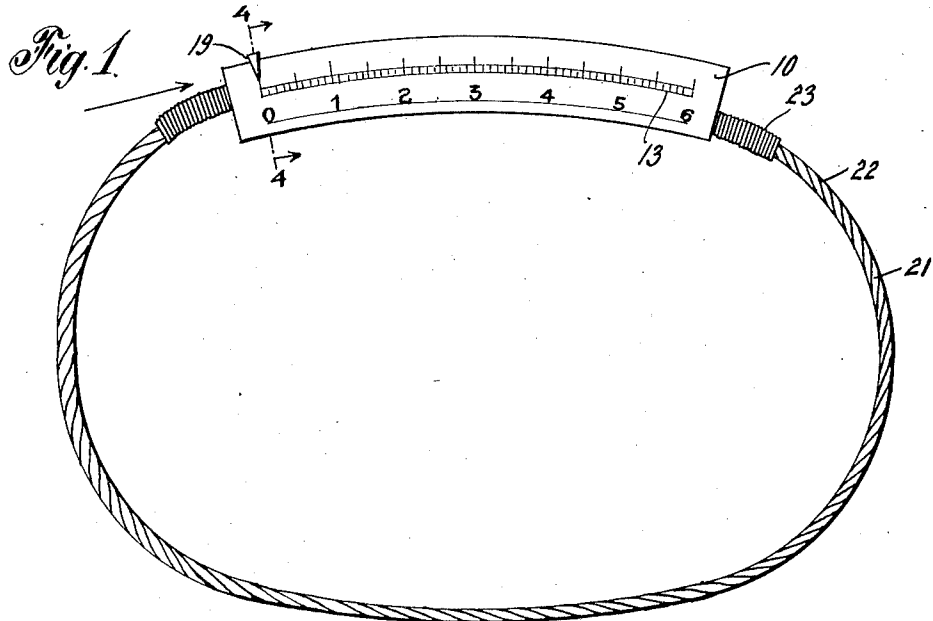


B. DE BERNYZ.
RESPIRATION INDICATOR.
APPLICATION FILED OCT. 29, 1919.

1,357,545.

Patented Nov. 2, 1920.



INVENTOR
B. de Bernyz
BY
Sigmund Herzog
ATTORNEY

UNITED STATES PATENT OFFICE.

BERTRAND DE BERNYZ, OF NEW YORK, N. Y.

RESPIRATION-INDICATOR.

1,357,545.

Specification of Letters Patent.

Patented Nov. 2, 1920.

Application filed October 29, 1919. Serial No. 334,357.

To all whom it may concern:

Be it known that I, BERTRAND DE BERNYZ, a citizen of the United States, and a resident of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Respiration-Indicators, of which the following is a specification.

The present invention relates to improvements in respiration indicators, that is to say to an apparatus designed to show proper or possible faulty inspiration and expiration of air into and from the lungs, thereby aiding in correcting the act of breathing.

It is essential that, in respiration, each time a long breath of air be drawn, so that both lungs be fully filled with air. Each time a person draws breath, among other things, the diaphragm contracts, allowing the lungs plenty of room to expand. During expiration the diaphragm relaxes and rises in the form of a dome. Outwardly, this contracting and relaxing of the diaphragm is recognizable by the expansion and contraction, respectively, of the abdomen. If during inspiration the abdomen does not expand and during expiration the abdomen does not contract, the respiration is faulty.

The main object of the present invention is to provide a simple and efficient apparatus for indicating and measuring the expansion and contraction of the abdomen during inspiration and expiration, respectively.

Another object of the invention is to provide an apparatus of this type, which is adapted to be attached to the body of the person whose respiration is to be tested, thereby enabling the person to read the scale of the apparatus not only in standing or sitting positions, but also in lying position.

A further object of the invention is to so construct the apparatus that it may be conveniently adjusted to persons of different sizes.

A still further object of the invention is to produce a device of the character described which is capable of manufacture on a commercial scale, or in other words one which is not so difficult to make as to be beyond the reasonable cost of such a contrivance.

With these and other objects in view, which will more fully appear as the nature of the invention is better understood, the same consists in the combination, arrangement and construction of parts hereinafter described, pointed out in the appended

claims and illustrated in the accompanying drawings, it being understood that many changes may be made in the size and proportion of the several parts and details of construction within the scope of the appended claims without departing from the spirit or sacrificing any of the advantages of the invention.

One of the many possible embodiments of the invention is illustrated in the accompanying drawings, in which:—

Figure 1 is a plan view of an apparatus constructed in accordance with the present invention; Fig. 2 is a horizontal section taken therethrough, on a larger scale, showing the upper half turned over and reversed end to end; Fig. 3 is a front elevation of the device also on a larger scale; Fig. 4 is a section taken on line 4—4 of Fig. 1, on a larger scale; and Fig. 5 is an end view of the apparatus, looking in the direction of the arrow shown in Fig. 1 of the drawings.

In the drawings, the numeral 10 indicates an arc-shaped body, preferably made of metal and of any suitable cross-section. In the case illustrated in the drawings, this body is made in the form of an angle iron, having a vertical flange 11, properly curved or shaped to fit the abdomen of a person. From this vertical flange extends forward a horizontal flange 12, on which is provided a graduated scale 13, arranged on the arc of a circle. The zero point of this scale is disposed adjacent the left-hand side of the apparatus (Fig. 1), while the highest graduation mark is located adjacent the right-hand side of the body 10. The ends of the body 10 are closed by vertical plate members 14 and 15, which are preferably made integral with the body 10. Below the horizontal flange 12, the body 10 is provided with an enlargement 16, extending throughout its length. Through this enlargement extends a channel 17, which may be of any suitable cross-section, for instance circular. The channel is arc-shaped, its curvature corresponding to that of the flange 11, as clearly appears from Fig. 2 of the drawings. In the front portion of the enlargement 16 is provided a slot 18, extending substantially from the plate member 14 to the plate member 15, and from the front face of the said enlargement to the channel 17. With the scale 13 coöperates a pointer or hand 19, the same being disposed above the horizontal flange of the body 10 and made preferably integral

with a bracket 20, that is located below the said horizontal flange and extends through the slot 18 into the channel 17. The bracket is attached to a belt 21, part of which extends into and is shiftably disposed within the channel 17.

The belt 21 is non-expansible longitudinally, but must be flexible in order to accommodate itself to the abdomen of a person. This belt may be of any suitable construction, for instance it may be made in the form of a Bowden-wire, comprising a non-extensible wire rope 22, inclosed by a tube 23. This tube is formed of coiled wire, the coils of the said wire being arranged close to each other. One end of the wire rope, denoted by the numeral 24, extends into the channel 17 and has attached to it the hand-carrying bracket 20. The other end of the said wire rope has drawn over it a cap 25 and is adapted to be fixed to the plate member 15. The tube 23 extends around belt 21 its full length from the said cap to the plate member 14, one end of the said tube being attached to the said cap and the other end to the plate member 14.

In the plate member 15 is formed an opening 26, comprising a larger portion 27 and a smaller portion 28. Through the larger portion 27 the capped end of the belt is drawn, according to the requirements, and then shifted into the smaller portion 28 of the opening, whereby the capped end of the belt is held against longitudinal movement. It is obvious that any other suitable means may be provided for attaching the capped end of the belt to the body 10.

The operation of the device is as follows: The arc-shaped body 10 is placed against the abdomen of the person whose respiration is to be tested, and the belt 21 carried around the body of the person, the capped end of the said belt being drawn through the opening 26 and clamped in the smaller portion 28 of the said opening exactly at the end of a respiration. In these positions of the elements of the respiration indicator, the hand 19 is at zero on the dial. If the respiration of the person is correct, during the next respiration the abdomen expands, thereby shifting the end 24 of the wire rope 22 in the channel 17 in the direction of the arrow shown in Fig. 2, carrying with it the hand 19. When the abdomen is fully expanded, the said hand will indicate on the scale the extent of the inspiration. During expiration, the coiled wire 23 causes the wire rope to move in the opposite direction, bringing the hand 19 back to zero position. If the

respiration is faulty, that is to say if the abdomen contracts during the inspiration, the wire rope is not shifted, or in other words the hand stays at zero. The person, watching the movement of the hand, thus becomes aware of the fact that the respiration is faulty and exercises until the desired result is obtained.

Obviously, the movement of the hand on the dial indicates not only proper or faulty respiration, but indirectly also the quantity of air drawn in during each inspiration.

It is obvious that, inasmuch as the respiration indicator is attached to the body of the person whose respiration is to be tested, the device may be used in standing, sitting and lying positions. The device may be easily adjusted to persons of different sizes, as appears from the foregoing.

It is also obvious that, while herein a specific belt construction has been described, any other belt may be used without departing from the invention, which lies mainly in the provision of a rigid body provided with a graduated scale, in combination with a belt, one end of which is fixed to said rigid body and the other end is shiftable thereon, said shiftable end carrying a hand or pointer cooperating with said graduated scale.

What I claim is:—

1. A respiration indicator comprising a rigid body, a non-expansible belt having one of its ends shiftably disposed upon said body and its other end fixed thereto, said body having thereon a graduated scale, a hand cooperating with said scale attached to the shiftable end of said belt, and a spring acting upon said belt having a tendency to keep said hand on zero position on said scale.

2. A respiration indicator comprising a rigid body, a wire rope having one of its ends shiftably disposed upon said body and its other end fixed thereto, said body having thereon a graduated scale, a hand cooperating with said scale attached to the shiftable end of said wire rope, and a spring tube inclosing part of said wire rope and having a tendency to keep said hand on zero position on said scale.

3. In a respiration indicator according to claim 2, said spring tube being secured to the fixed end of said wire rope and to the opposite end of said body.

Signed at New York, in the county of New York and State of New York, this 14th day of October, 1919.

BERTRAND DE BERNYZ.