

Nov. 1, 1927.

1,647,299

O. KÖNIG

RESPIRATION BELT

Filed Dec. 28, 1926

2 Sheets-Sheet 1

Fig. 1.

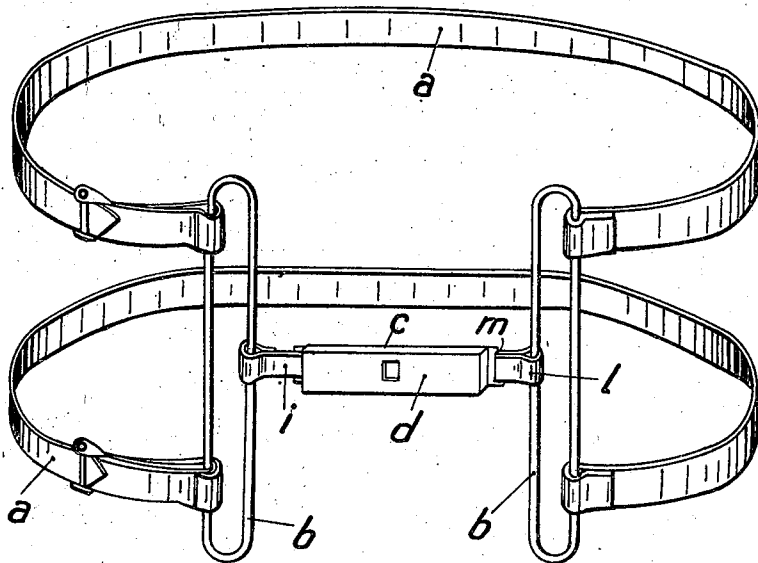
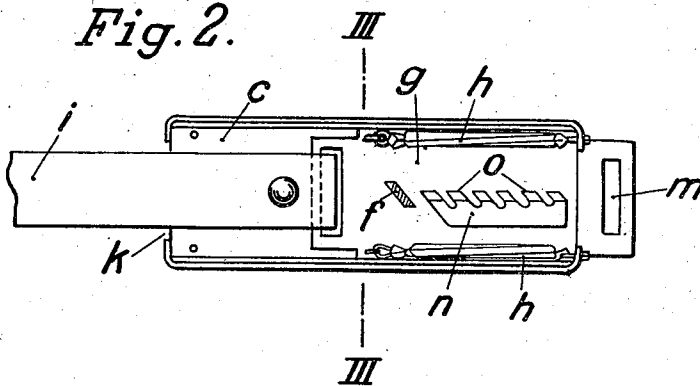


Fig. 2.



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Fig. 3.

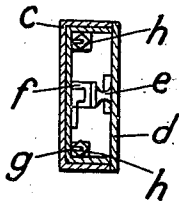


Fig. 4.

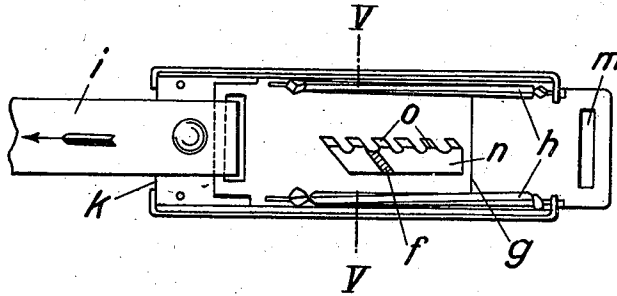


Fig. 5.

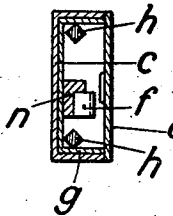


Fig. 6.

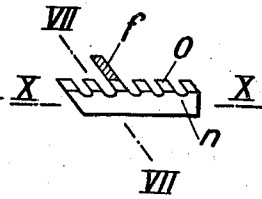


Fig. 7.

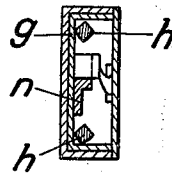


Fig. 8.

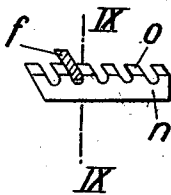


Fig. 9.

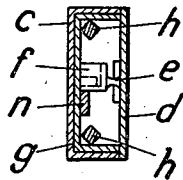


Fig. 10.

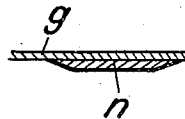
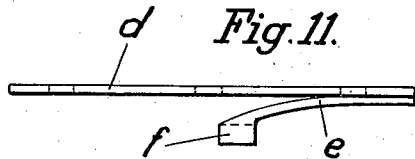


Fig. 11.



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UNITED STATES PATENT OFFICE.

OTTO KÖNIG, OF BAR REICHENHALL, GERMANY.

RESPIRATION BELT.

Application filed December 28, 1926, Serial No. 157,571, and in Germany March 4, 1926.

This invention relates to a respiration belt for carrying out respiration-exercises in order to obtain a uniform breathing which, with the aid of the belt, is carried out forcibly. The respiration belt is of special advantage for such persons who breathe only superficially as asthmatic people and such people who suffer of dilatation of the lungs and of tuberculosis. The belt according to the invention has a buckle which comprises an automatically acting locking mechanism which, when the patient exhales incompletely locks the buckle automatically so that it prevents inhaling, which can be carried out again only after complete exhaling.

An embodiment of the invention is shown, by way of example, in the accompanying drawing, in which:

Fig. 1 is a perspective view of the belt.

Fig. 2 shows the buckle of the belt in elevation in open position.

Fig. 3 is a cross section on line III—III of Fig. 2.

Fig. 4 shows in elevation the locking mechanism of the buckle in an intermediate position.

Fig. 5 is a section on line V—V of Fig. 4.

Fig. 6 shows another intermediate position of the locking mechanism of the buckle.

Fig. 7 is a cross section on line VII—VII of Fig. 6.

Fig. 8 shows a third intermediate position of the locking mechanism of the buckle.

Fig. 9 is a cross section on line IX—IX of Fig. 8.

Fig. 10 is a cross section on line X—X of Fig. 6.

Fig. 11 shows the locking pawl in plan view.

The belt *a* is made from convenient material as leather, or the like, which is not elastic, and might consist for instance either of one or, as shown in Fig. 2 of two straps which are about 10 cms. broad. The belt is to be buckled around the breast so that it is securely held on the breast. The ends of the two straps *a* are connected the one with the other by means of oblong eyes *b*, *b* which are connected the one with the other by means of a buckle. To facilitate the putting on of the belt the bands *a* may have automatically closing spring hooks not shown in the drawing and engaging with the corresponding oblong eye *b*.

The buckle consists of a flat casing *c* with a movable lid *d*, in which a locking pawl is

mounted which is shown in Fig. 11 and which consists of a thin elastic shaft *e* and of a rearwardly directed oblong locking tooth *f*. In the casing *c* a plate *g* bearing onto the rear wall of the casing is slidably guided, said plate being controlled by means of pulling elements *h* attached at the one end to said plate *g* and at the other end to said casing *c* and consisting of rubber strings or spiral springs which have the tendency to pull the slidable plate *g* into the position of rest shown in Fig. 2. To the one end of the sliding plate *g* a movable strip *i* is attached which is connected to one of the oblong eyes *b* and passes through an aperture *k* of the corresponding end wall of the casing *c*. The other end of the rear wall of casing *c* has an eye *m* in which the two ends of a loop-shaped strap *l* are attached which passes through the second vertical oblong eye *b*. The slidable plate *g* carries a rack *n* of angular cross section and having a number of teeth *o*, the gaps between said teeth being so wide that the locking nose *f* can freely pass between said teeth. The teeth *o* are parallel to the locking nose *f*, i. e. standing at the same angle to the longitudinal axis of the slidable plate *g* as this locking nose.

The operation of the belt is as follows:

The locking pawl *f* adopts the position shown in Fig. 2 when the person, who wears the belt, exhales completely, the nose of the locking pawl standing in front of the rack *n*. At the inhaling the belt, which has been adjusted to the correct width, is expanded and the strip *i* pulls the slidable plate *g* into the direction of the arrow shown in Fig. 2, i. e. moves the same in the casing *c* in opposite direction to the loop-shaped strap *l*, whereby the nose of the locking pawl *f* is pressed onto the lower side of rack *n* so that this rack slides along the locking pawl. When the patient has completely inhaled, the rear end of the rack *n* stands in front of the nose *f* of the locking pawl so that the same is released and, owing to the elasticity of shaft *e*, the nose *f* is raised so that it stands over the upper side of the rack *n*. At the exhaling the pulling elements *h* which have been put under tension pull the slidable plate *g* and the holding strip *i* into the initial position so that the upper ends of teeth *o* slide, as shown in Fig. 6, along the nose *f* of the pawl. When the person who wears the belt has not inhaled completely but only partly, the locking nose *f* snaps into engage-

ment with one of the gaps between the teeth *o*, whereupon the locking pawl is lifted out of the rack *n* and adopts again the position shown in Fig. 6, owing to the inclined position of the teeth *o* and of the direction of pull of the detending rubber strings *h*. The locking mechanism in the buckle permits consequently of a complete inhaling as well as of a partial inhaling.

- 10 If however the person who wears the belt does not exhale completely, i. e. interrupts the exhaling during the backward movement of the slidable plate *g*, the nose *f* of the locking pawl will come into engagement
 15 with the next gap between teeth (Fig. 8) and lock the rack. If in this position of the locking mechanism in the buckle the person who wears the belt tries to inhale, the locking nose *f* will be pressed the more
 20 strongly into the corresponding gap between teeth, so that the belt is locked and inhaling is prevented. The person must consequently exhale completely again in

order that the nose *f* of the locking bolt gets into the position shown in Fig. 2, i. e. 25 the position which permits inhaling. The patient is therefore forced to exhale completely so that his lungs work properly.

The buckle of the belt may be of any other than the rectangular shape, i. e. it 30 might have a circular shape.

I claim:--

A respiration belt comprising in combination, a strap of non-elastic material, a buckle 35 connecting the two ends of said strap, and consisting of a flat casing, of a slidable plate in said casing, of a rack having oblique teeth, and of an elastic locking pawl having an oblique nose designed to engage with any of 40 the gaps between the teeth of said rack and designed for automatically locking said belt to prevent inhaling as long as the patient has not completely exhaled.

In testimony whereof I affix my signature.

OTTO KÖNIG.