No. 651,962. Patented June 19, 1900.

D. BOGHEAN.

APPARATUS FOR TREATING RESPIRATORY DISEASES.

(Application filed May 4, 1898.)

(No Model.)

Fig. 1.

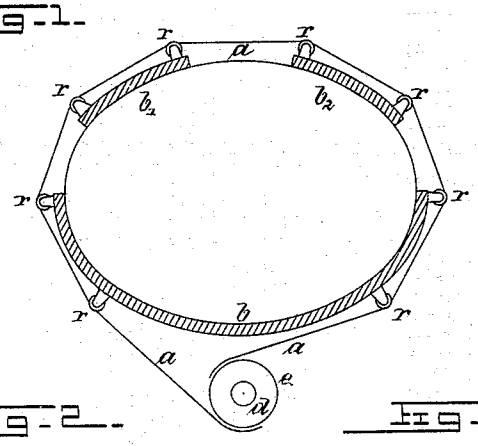


Fig. 2.

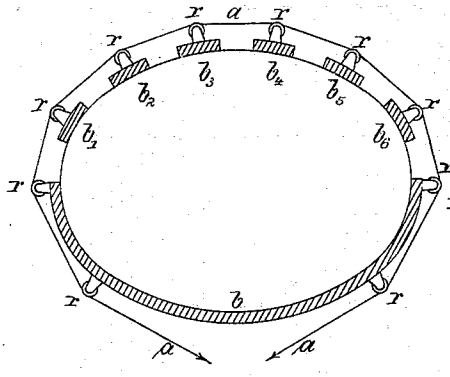


Fig. 3.

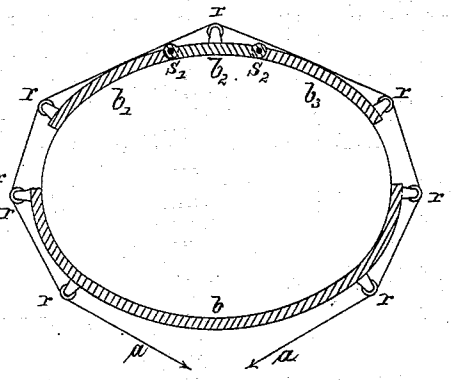


Fig. 4.

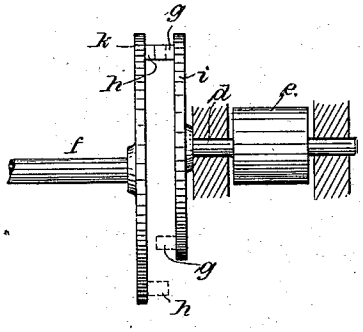
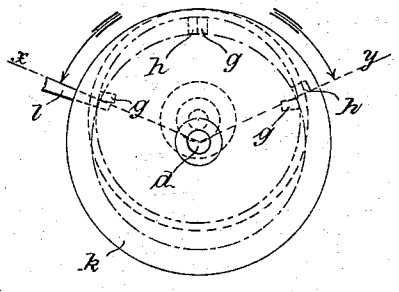


Fig. 5.



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UNITED STATES PATENT OFFICE.

DEMETRIUS BOGHEAN, OF VIENNA, AUSTRIA-HUNGARY.

APPARATUS FOR TREATING RESPIRATORY DISEASES.

SPECIFICATION forming part of Letters Patent No. 651,962, dated June 19, 1900.

Application filed May 4, 1898. Serial No. 679,716. (No model.)

To all whom it may concern:

Be it known that I, DEMETRIUS BOGHEAN, a subject of the King of Roumania, residing at Vienna, Empire of Austria-Hungary, have invented a new and useful Apparatus for the Treatment of Respiratory Diseases, of which the following is a full, clear, and exact description.

The present invention consists of an apparatus for the treatment of respiratory diseases by means of which the breathing of a patient may be regulated both as regards the periods of time in which the breath is drawn and the depth of the same.

In order to render the specification more easily intelligible, reference is had to the accompanying drawings, in which similar letters of reference denote similar parts throughout the several views.

Figure 1 is a sectional plan of one form of the invention; Fig. 2, a similar plan of a modified form; Fig. 3, a similar plan of a further modification; Fig. 4, a sectional side elevation of a device for tightening and loosening the regulating-band, and Fig. 5 a front elevation of Fig. 4.

According to the invention a cord or band is employed in connection with the patient, said cord or band being arranged around the chest of the patient and periodically tightened to produce the expiration and periodically loosened to allow of relaxation of the chest and lungs, (inspiration.) The band does not act directly on the body, but is employed in combination with a series of plates or cushions, which are fitted properly to various parts of the chest and back, according to the nature of the disease to be treated.

In the drawings, according to Fig. 1, plates or cushions b b' b^2 are fitted, the former advantageously to the back and the latter to parts of the chest. These plates are connected by means of a cord or band a, adapted to run on antifriction-rolls at the back of the plates, the ends of said bands being attached to a drum e, Fig. 4, which is periodically turned a certain portion of a revolution and then released. In Fig. 2 a greater number of plates or cushions is employed, (b to b^6,) the cord being mounted in a similar manner. Fig. 3 shows the side wings or plates b' b^3 hinged to the breastplate b^2, the back-plate b being the same shape in all cases.

The means for periodically contracting or drawing together the cord or band, and thus producing respiration, may be of any kind whatever. An electric motor is advantageous, as owing to the very small amount of power required it may be mounted on the back plate or cushion b and carried by the patient. The drum e, Figs. 4 and 5, is mounted on a shaft d, having a disk i in proximity to an eccentrically-mounted shaft f, having a disk k. The disk i is provided with a cam-pin g and the disk k with a cam-pin h. Thus if the latter disk is continually rotated by means of the electromotor owing to the eccentric position of this disk with regard to the disk i the two cam-pins h and g will remain in engagement during a part of the revolution of the disk k, as indicated at Fig. 5 from x to y. During the other part of the revolution the disk i will be disengaged from the motor-disk k and will be returned to its initial position by the inspiration of the patient as he or she draws in breath. A stop l is arranged on a stationary part of the machine to arrest the disk i in its proper position when it is returned by the inspiration of the patient. The electromotor may be connected by suitably-long wires to any suitable source of electricity. The wires may be long enough to allow the patient sufficient room for movement. In the event of a number of patients being supplied with electricity in a limited space for walking exercise the motor of each patient may be connected to overhead conductors in the known manner.

From the above description it will be clear that the plates or cushions b may be adapted to any disease, according to requirement, their shape and the pressure of the cord thereon being variable to the finest degree. The periods of inspiration and breathing out may be varied at will by varying the number of revolutions made by the driving-power motor. The plates will as a rule be sufficiently supported on the body by friction and the cord passing around the same, which is never entirely released. In the drawings the plates

are indicated as being supported by a band passing along their inside, but they might be supported on the chair or bed of the patient.

It will be obvious that the power for operating the device may be taken from any motor, whether electrical or other, that the breathing periods may be varied at will, as also that the shape and position of the plates or cushions may be varied to suit all kinds of diseases which it is intended to cure by enforcing a regular breathing both as regards the depth and the length of breath. The depth will be regulated by the periods of engagement of the motor-disk with the apparatus disk, which also regulates the periods of respiration.

One of the main features of the invention consists in not connecting the cord or band *a* direct to the plates or cushions, but in allowing the same to run over antifriction-rolls mounted on each plate.

Although the motor has been described as being advantageously mounted on the back plate *b*, this need not necessarily be the case. It could be mounted at any other convenient point.

I claim as my invention—

1. In an apparatus for regulating the breathing of patients, the combination of a series of plates to fit various parts of the chest and means for movably supporting the same, said plates having guide-rolls mounted on their backs, a cord to pass over all the said guide-rolls, and means for contracting said cord and allowing the same to expand periodically at regular intervals in the manner and for the purpose substantially as described.

2. In an apparatus for regulating breathing the combination of a single plate to encompass the back of the patient, said plate having guide-rolls on its outer surface, a series of plates to fit the various parts of the front of the chest, said plates also having guide-rolls thereon, a cord to pass over all the guide-rolls and means for movably supporting the said plates and periodically contracting and allowing the said cord to expand at regular intervals, in the manner and for the purpose substantially as described.

3. In an apparatus for regulating breathing, the combination of a series of pressure-plates to fit various parts of the chest and means for movably supporting said plates, said plates having guide-rolls at the outer side of the same, a cord to pass around all the guide-rolls, a drum to which the ends of the said cord are attached and means for moving the disk positively in one direction and allowing it to be returned by the action of the chest of the patient in the manner and for the purpose substantially as described.

4. In an apparatus for regulating breathing, the combination of a series of plates to fit various parts of the chest and means for movably supporting said plates, said plates having guide-rolls at the back thereof, a cord to pass over said guide-rolls, a drum at the back of the patient to the periphery of which the ends of the said cord are attached and means for positively reciprocating the said drum in one direction consisting of a disk mounted on the spindle of the said drum and having a pin projecting from its face near the periphery of the same, an eccentrically-mounted disk and a shaft to support the same, said eccentrically-mounted disk having a pin near the edge of its face and projecting therefrom and being mounted in proximity to the said disk on the cord-shaft, said pins being adapted to contact and couple during a part of each revolution of the shaft of the eccentrically-mounted disk in the manner and for the purpose substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

DEMETRIUS BOGHEAN.

Witnesses:
HENRY C. CARPENTER,
CHAS. E. CARPENTER.