Aug. 15, 1939. A. C. N. ANDERSEN 2,169,784

APPARATUS FOR PRODUCING ARTIFICIAL RESPIRATION

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Fig. 1.

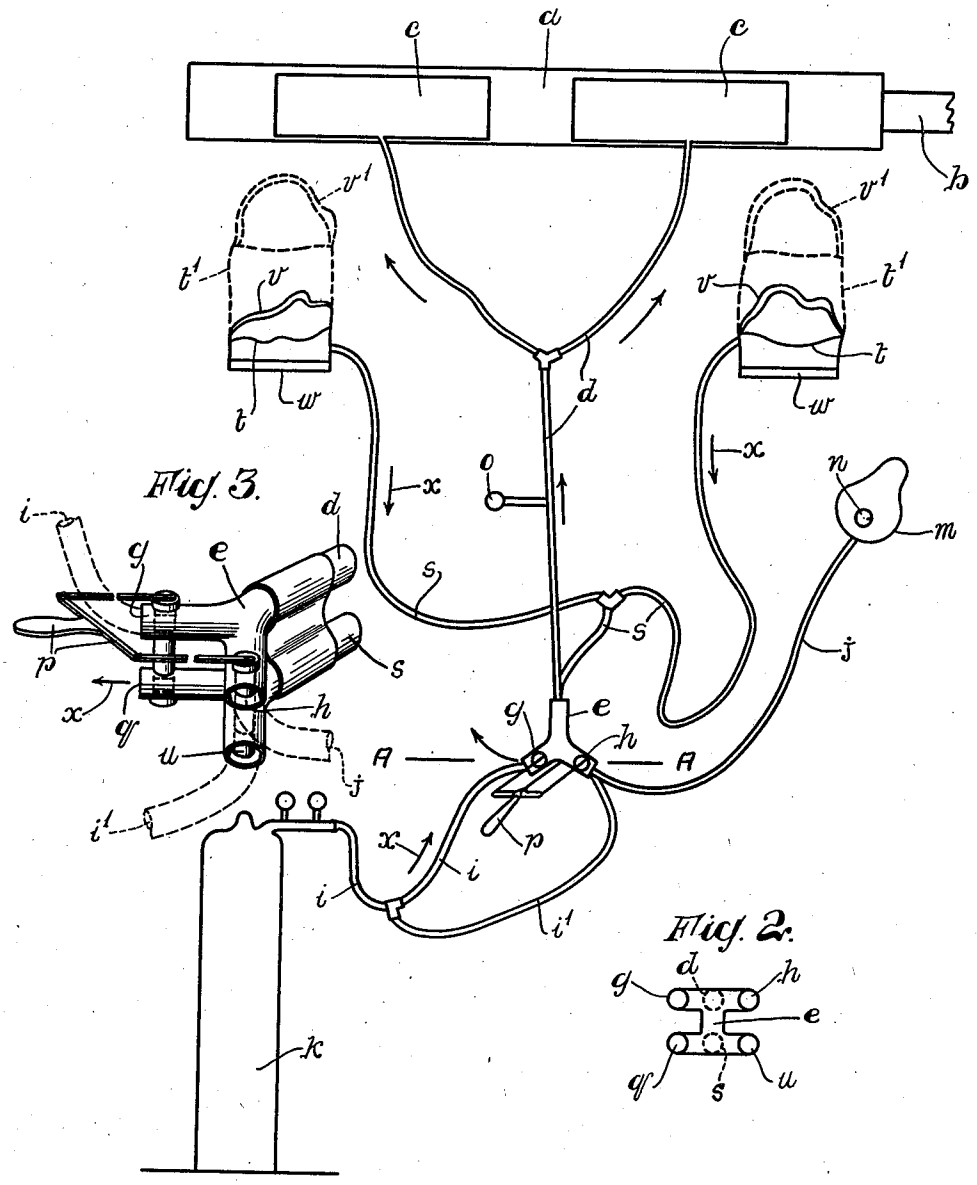

Fig. 2.

WITNESSES.

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APPARATUS FOR PRODUCING ARTIFICIAL RESPIRATION

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In order to produce artificial respiration, rhythmical compression and expansion of the chest of the patient has been effected by means of a belt fitted with elastic air-cushions adapted to lie against the sides of the chest of the patient—who is preferably placed face downward—and which cushions on being filled by a compressed mixture of oxygen and carbon dioxide or compressed air, effect a measurable compression of the chest.

The present invention proposes to associate with an appliance of the kind referred to, means whereby the arms of the patient may be mechanically raised and lowered, and comprises air cushions adapted to be placed under the patient's arms, a valve box or casing adapted for connection with a pressure fluid supply, a valve-actuating handle connected with said casing, a face mask, and tubular connections with said belt and arm cushions, face mask, and valve box; the arrangements being such that on said valve-actuating handle of the valve box or casing being moved in one direction connection is opened between the belt cushions and face mask and between the pressure fluid supply and arm lifting cushions, and when the handle is moved in reverse direction said connections are closed and connection is established between the pressure fluid supply and belt cushions and between the arm lifting cushions and the atmosphere.

For the inflation of the arm-lifters, which preferably comprise elastic india-rubber containers with linen covers and solid base members, pressure fluid is utilized from the source which serves for the inflation of the cushions of the chest belt to compress the patient's chest and cause expulsion of breath from the lungs.

Straps or braces connected with the arm-lifters are placed over the arms and shoulders of the patient under treatment. I will further describe my invention with the aid of the accompanying sheet of explanatory drawings in which:

Fig. 1 shows the apparatus schematically, and Fig. 2 shows the valves schematically, and taken as on line A—A, Fig. 1.

Fig. 3 is an enlarged perspective view illustrating the valve box and parts associated therewith.

a is a belt provided with air-cushions *c* and straps *b*, and which belt when in use is loosely placed round the chest of the patient, who is preferably lying on his stomach. *m* is a face mask of any known suitable construction fitted with an exhaling valve *n*. Said air cushions *c* are connected with a bipartite pipe *d* provided with a manometer *o* and associated with a valve box or casing *e* having two pairs of taps or valves *g*, *q* and *h*, *u*, which are built together and controlled by a common handle *p*. *t* are linen-covered india-rubber cushions provided with straps or braces *v* and stiff base pieces *w* which form supporting plates. In use, an air-cushion *t* is placed under each arm of the unconscious patient and the straps or braces *v* are fitted over his arms or shoulders.

Valves *g* and *h*—by the aid of tubes *i*, *j*—respectively connect pipe *d* with a bottle *k* containing pressure fluid and the face mask *m*.

Valve *u* connects, by means of tubes i^1 and *s*, the pressure fluid bottle *k* with the two arm-lifters *t*; whilst valve *q* connects the tubes *s*, and so the arm-lifters, with the atmosphere.

By turning handle *p* to the left, the two valves *g*, *q* are opened, and simultaneously the two valves *h*, *u* are closed; and on turning said handle to the right, valves *h*, *u* are opened and at the same time taps *g*, *q* are closed.

When handle *p* is turned to the right, pressure fluid contained in the cushions *c* of belt *a* will pass into the mask *m* for inhalation by the patient. At the same time tap *u* is opened and pressure fluid passes from bottle *k* through the pipes i^1 and *s* to the arm-lifters *t* which are filled and occupy the position shown by the dotted lines t^1, v^1. Said arm-lifters rise to a height of approximately 35 cm. and so lift the arms of the lifeless person to a corresponding height and thereby increase inhalation through the mask.

When handle *p* is moved to the left, valve *h* shuts off the mask and valve *u* shuts off the arm lifters, whilst valves *g* and *q* simultaneously connect the pressure fluid bottle *k* with air-cushions *c* of chest belt *a*, and arm-lifters *t* with the atmosphere. The pressure fluid thereupon passes from bottle *k* into the belt and acts upon the chest of the patient and at the same time the fluid contained in the arm-lifters escapes (as shown by arrow *x*) through the valve *q* to the atmosphere. Cushions *t* thereupon sink together to the positions shown in full lines, and as the arms of the patient also sink expulsion of breath is induced.

What I claim as my invention and desire to secure by Letters Patent is:

1. In combination with apparatus for producing artificial respiration by the aid of a belt fitted with elastic air cushions adapted to lie against the sides of the chest of the patient, means whereby the arms of the patient may be mechanically raised and lowered, such means comprising air cushions adapted to be placed under the patient's

arms, a valve box adapted for connection with a pressure fluid supply, a valve-actuating handle connected with said valve box, a face mask, and tubular connections with said belt and arm cushions, face mask and valve box; the arrangements being such that on said vlave-actuating handle being moved in one direction connection is opened between the belt cushions and face mask and between the pressure fluid supply and arm lifting cushions, and when the handle is moved in reverse direction said connections are closed and connection is established between the pressure fluid supply and belt cushions and between the arm lifting cushions and the atmosphere.

2. Apparatus for producing artificial respiration as claimed in the preceding claim, characterised in that the air cushions which serve as arm-lifters are each formed by linen covered elastic india-rubber containers with straps adapted to be placed over the arms or shoulder of the person under treatment.

3. Apparatus for producing artificial respiration as claimed in the preceding claim 1, and in which the air cushions which serve as arm-lifters are each formed by linen covered elastic india-rubber containers with straps adapted to be placed over the arms or shoulders of the person under treatment, characterised in that the arm-lifting air cushions are provided with stiff bottom pieces which serve as supports for said cushions.

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