

No. 680,028.

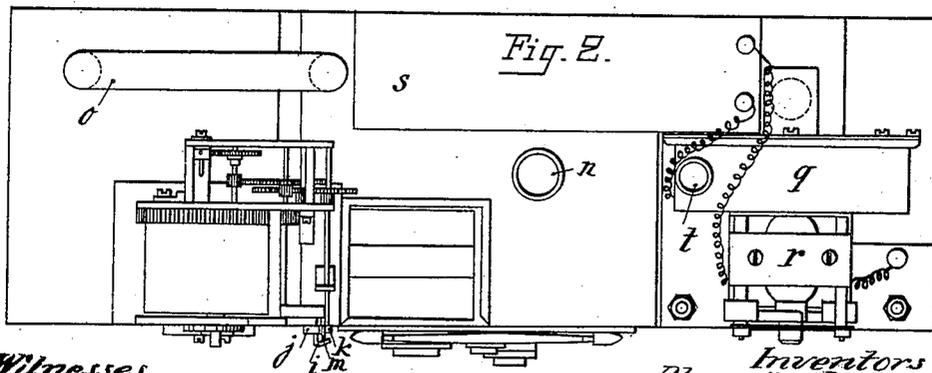
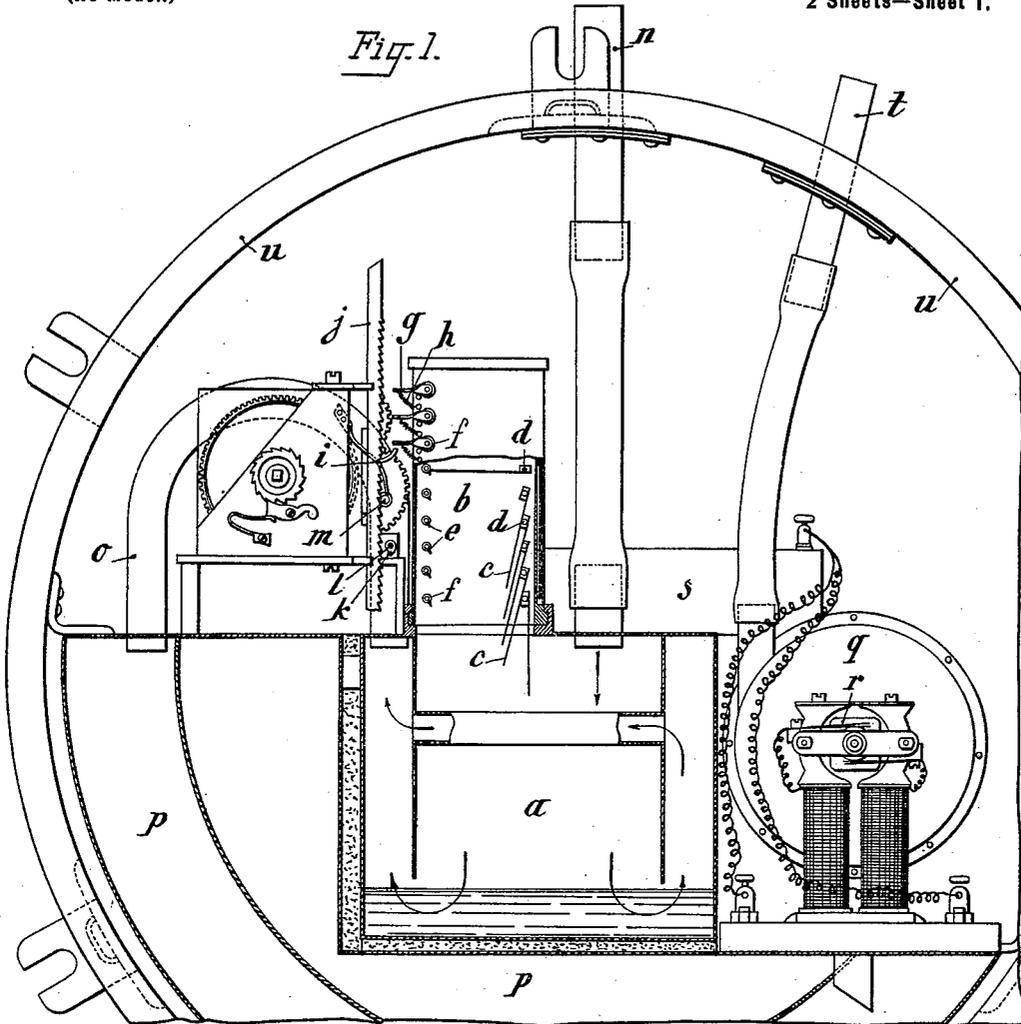
Patented Aug. 6, 1901.

A. DESGREZ & V. BALTHAZARD.  
APPARATUS FOR REGENERATING AND PURIFYING AIR.

(Application filed Jan. 4, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses  
*Paul Hunter*  
*John Latta*

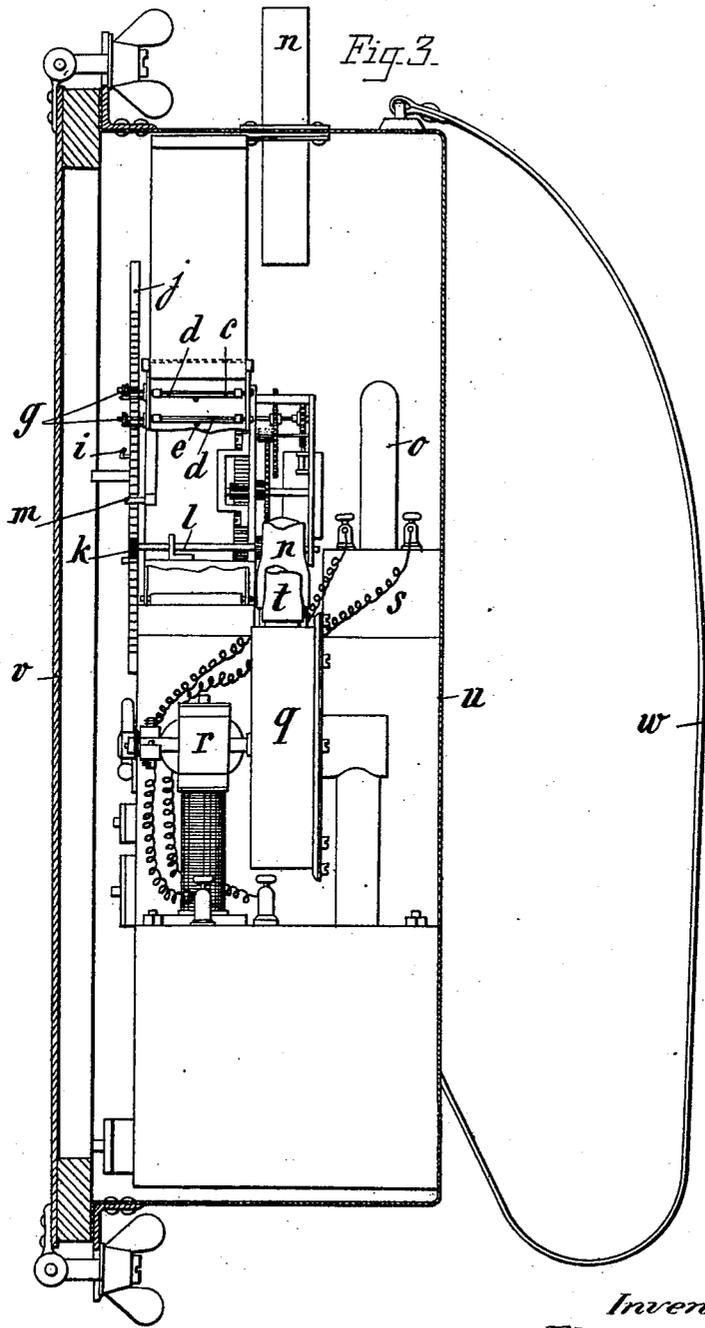
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# UNITED STATES PATENT OFFICE.

ALEXANDRE DESGREZ AND VICTOR BALTHAZARD, OF PARIS, FRANCE.

## APPARATUS FOR REGENERATING AND PURIFYING AIR.

SPECIFICATION forming part of Letters Patent No. 680,028, dated August 6, 1901.

Application filed January 4, 1901. Serial No. 42,082. (No model.)

*To all whom it may concern:*

Be it known that we, ALEXANDRE DESGREZ, professor at the Faculty of Medicine at Paris, of 240 Rue St. Jacques, and VICTOR BALTHAZARD, clinical clerk, of 61 Rue de Bretagne, Paris, in the Republic of France, have invented Improvements in Means or Apparatus for Regenerating and Purifying Air, of which the following is a full, clear, and exact description.

The object of the present invention is to construct an apparatus for regenerating and purifying confined and vitiated air.

The class of apparatus herein described permits of the application of the decomposition of sodium bioxid or any other alkaline bioxid by cold water, with the object of producing at the same time oxygen and soda, with which the vitiated air is placed in contact. The oxygen generated replaces that which has been used in respiration and the soda fixes or absorbs the carbonic acid coming from the gases of expiration. In addition the foul air and toxic matters produced by respiration are destroyed by this reaction, which is of an oxidizing character.

Our apparatus consists, essentially, of, first, an apparatus for distributing automatically sodium bioxid; second, a generator in which the reaction of water upon the sodium bioxid is produced; third, a fan or ventilator which causes the circulation of air in the apparatus.

In order that the invention may be more clearly understood, we have shown in the accompanying drawings, by way of example only, an apparatus constructed according to our invention, arranged so that it may be portable.

Figure 1 is an elevation, Fig. 2 is a plan, and Fig. 3 is an end view, of the same.

In all the figures like parts are indicated by similar letters of reference.

As shown in the drawings, our apparatus consists, essentially, of a reaction-chamber *a*, containing water and into which falls automatically and at regular intervals a predetermined quantity of sodium bioxid, placed in the distributing apparatus *b*. This latter contains a certain number of superposed plates *c*, carrying the sodium bioxid, which are capable of swinging around their axis *d*. Each plate is originally held in a horizontal

position by a stop *e*, arranged on an axis *f*, carrying at one of its ends a short arm *g*, held in position by a tension-spring *h*. The release of each plate is caused by the rising of a tappet or projection *i*, which causes successively each arm *g* to turn. This projection *i* is carried by a rack *j*, which receives its vertical upward motion by means of a pawl *k*, keyed upon a shaft *l*, set in motion by clockwork. Another pawl or detent *m* retains the rack and prevents its falling. The vitiated air is drawn into the reaction-chamber *a* through a pipe *n*, is there regenerated by contact with the reacting media, and passes out by the tube *o*. As this air has been heated by the reaction, it passes through a refrigerator *p*, which restores it to its initial temperature. This refrigerator may contain ice or any other refrigerating body, such as chlorid of methyl, for example. The circulation of this air is caused by a fan *q*, operated by a small electric motor *r*, which is driven by a current furnished by any suitable source *s*, which in the present case consists of small accumulators. This electric motor may be replaced by any other suitable motor, such as clockwork. The air, completely regenerated, is forced out through the tube *t*.

The whole apparatus is inclosed in a box *u*, hermetically closed by a cover *v*, held in position by swing-bolts and winged nuts. The box is provided with straps *w* to enable it to be carried upon the back of the person who is about to use the apparatus. The two tubes *n t* communicate with a closed space, diving-dress, or other space in which the person may be situated.

Our apparatus as above described may be employed by persons who are in places where the air is unable to sustain life—firemen, miners, workmen in chemical factories, &c. By our arrangement of apparatus the man carries upon himself all that is necessary for the regeneration of the air which he is using and remains isolated from the foul or exhausted atmosphere in which he happens to be, and not being attached to any fixed exterior supply of air he retains his liberty of motion.

Our apparatus is equally applicable to diving-dresses. In this case it ought to be pro-

vided with an apparatus enabling the interior pressure of the apparatus to be increased as the diver descends.

Our arrangement may also be employed for fixed apparatus used in submarine boats, for example.

It will be understood that our apparatus may be varied in form and dimensions and that the details may be modified according to its different applications.

We claim—

1. In an apparatus for regenerating and purifying vitiated air, the combination of an air-inlet, a reaction-chamber containing water, means for releasing at regular intervals, a predetermined quantity of sodium bioxid which falls into the reaction-chamber, a refrigerator, a fan or ventilating apparatus, to draw the air through the apparatus, and an exit-orifice, substantially as herein shown and described.

2. In an apparatus for regenerating and purifying air, the combination of a closed case, an air-inlet tube, a reaction-chamber containing water into which said air-inlet opens, a distributing apparatus for an alkaline bioxid, arranged above said reaction-chamber, a number of hinged plates, carrying said alkaline bioxid, arranged in said distributing apparatus, a number of axes arranged in said distributing-chamber, a stop carried by each axis, a short arm arranged at the end of each axis, a rack, a projection carried by said rack, means for raising said rack, an exit-tube connected to the reaction-chamber, a refrigerator into which said exit-tube opens, a fan to draw air into the apparatus, and an exit-tube connected to the refrigerat-

ing-chamber, substantially as herein shown and described.

3. An apparatus for purifying vitiated air, comprising a purifying-receptacle provided with an air-inlet and an air-outlet so that a current of air may be forced through said receptacle, movable supports located adjacent to said receptacle and each adapted to carry a supply of a purifying agent, individual movable stops for holding said supports in a carrying position, and a releasing mechanism operatively connected with said stops, to cause them to successively release the supports, thus allowing the material carried by the supports to pass into the purifying-receptacle.

4. An apparatus for purifying vitiated air, comprising a purifying-receptacle provided with an air-inlet and an air-outlet so that a current of air may be forced through said receptacle, movable supports located adjacent to said receptacle and each adapted to carry a supply of a purifying agent, individual movable stops for holding said supports in a carrying position, a bar having a projection adapted to successively actuate said stops to release the corresponding supports and the material carried thereby, and mechanism for moving said bar.

The foregoing specification of our improvements in means or apparatus for regenerating and purifying air signed by us this 7th day of December, 1900.

ALEXANDRE DESGREZ.  
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