

Specification of William Hills Kitchen : producing artificial respiration.

Contributors

Kitchen, William Hills.

Publication/Creation

London : Great Seal Patent Office, 1866 (London : George E. Eyre and William Spottiswoode)

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A.D. 1865, *21st OCTOBER.* N° 2721.

S P E C I F I C A T I O N

OF

WILLIAM HILLS KITCHEN.

PRODUCING ARTIFICIAL RESPIRATION.

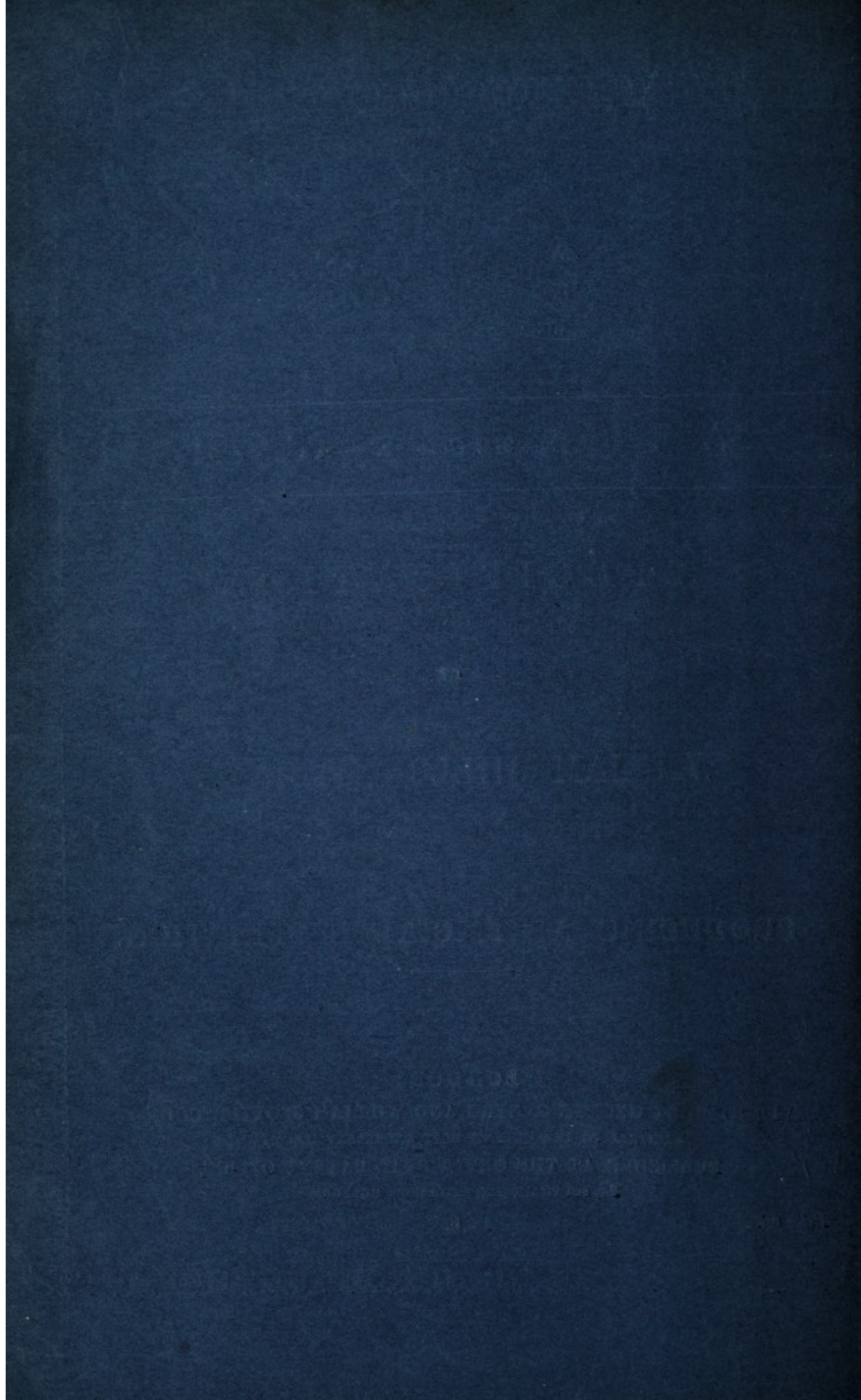
LONDON:

PRINTED BY GEORGE E. EYRE AND WILLIAM SPOTTISWOODE,

PRINTERS TO THE QUEEN'S MOST EXCELLENT MAJESTY ·

PUBLISHED AT THE GREAT SEAL PATENT OFFICE,

25, SOUTHAMPTON BUILDINGS, HOLBORN.





A.D. 1865, 21st OCTOBER. N^o 2721.

Producing Artificial Respiration.

LETTERS PATENT to William Hills Kitchen, of Newcastle-on-Tyne, in the County of Northumberland, for the Invention of "**A NEW OR IMPROVED APPARATUS FOR PRODUCING ARTIFICIAL RESPIRATION.**"

Sealed the 17th April 1866, and dated the 21st October 1865.

PROVISIONAL SPECIFICATION left by the said William Hills Kitchen at the Office of the Commissioners of Patents, with his Petition, on the 21st October 1865.

I, **WILLIAM HILLS KITCHEN**, of Newcastle-on-Tyne, in the County of Northumberland, do hereby declare the nature of the said Invention for "**A NEW OR IMPROVED APPARATUS FOR PRODUCING ARTIFICIAL RESPIRATION,**" to be as follows:—

This Invention consists of an arrangement for producing artificial respiration by making the air passing into the lungs to exceed the pressure of that which surrounds the external surface of the chest, the expiration being made into a medium not exceeding the pressure of the air surrounding the external surface of the chest, likewise for varying the atmospheric pressure on the external surface of the chest, similar to that which takes place at different altitudes above the level of the sea, the object which the Inventor has in view being to neutralize the chronic inaction of the organs of respiration induced by sedentary modes of life, and give expansion to the chest by a more certain method than has been hitherto employed.

Kitchen's Improved Apparatus for Producing Artificial Respiration.

The arrangement which the Inventor proposes to adopt in carrying out the objects set forth as above is first to insulate the whole of the body of the person using the apparatus in an air-proof chamber, which he designates by the name of an anti-sedentary couch, made sufficiently strong to bear a certain amount of atmospheric pressure. The said couch may be 5 made of wood coated with an air-tight composition, or may be made of gutta percha or indian-rubber supported by a suitable framing, or may be made of iron or other suitable air-tight material. In this couch are fitted two chambers going under the respective names of the inhaling and exhaling chambers, the air in which is put in connection with the 10 respiratory organs of the person using the apparatus by means of two tubes leading through a valve under the control of the person within the couch to a mouth-piece which is placed in the mouth. The inhaling chamber is put in connection with the external air by means of a valve. A communication is effected between this chamber and the couch by means of 15 another valve, while the couch itself communicates with the exhaling chamber by means of a third valve. If it is desired that the pressure of the air within the couch shall fall no lower than that which is required for inhalation by the person using the apparatus, the valve in the inhaling chamber is removed, and the respiratory organs are thereby put in direct 20 communication with the external air. The pressure of the air in the couch is prevented from falling below a certain point, or is regulated by so graduating the valves above mentioned between the inhaling chamber and the couch and the couch and the exhaling chamber, and by so withdrawing the air from the exhaling chamber by means of an air pump or other 25 apparatus attached to the exhaling chamber that the two valves above mentioned will always be in equilibrium. In order to produce a complete exhalation, the medium into which the exhalations takes place should not exceed in pressure the air in the couch. The valve leading from the exhaling chamber to the couch is graduated in weight so that the air 30 within shall not fall below a certain pressure. The mouth-piece being placed in the mouth, the exhaling chamber is so reduced by continued rarefaction by an air pump or otherwise, as stated above, that its valve is always kept in equilibrium, the valve leading from the couch to the external air being likewise kept in the same state. The person in the 35 couch closes his nostrils and opens a tap or valve, so that the mouth-piece is put in communication with the external air when an inspiration is made. If it is desired that the medium into which the expirations take place shall not fall below that which surrounds the external surface of the chest, the

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passage of the mouth-piece may be simply closed by the tongue, and the air passed through the nostrils into the couch, or, by using the exhaling chamber without the valve, communication may be opened between the mouth-piece and the exhaling chamber; but if the valve is used in this
5 chamber graduated in weight, then an expiration will take place into this chamber of such a complete nature as is determined by the excess of pressure in the couch above that in the chamber. When it is desired that the inhalation shall take place from a medium lower in pressure than the external air, the inhaling chamber is used with its valve weighted to
10 the desired excess of pressure of the external air above that desired to be inhaled. By simply opening and shutting the communications alternately between the mouth-piece and the inhaling and exhaling chambers artificial respiration is produced. By opening and shutting such communications to varying extents, the duration in time or the length of time employed in
15 an inhalation or exhalation may be determined, or this may be done by separate valves. The air inhaled into the lungs may be very simply raised in temperature by putting a bottle filled with hot water into the inhaling chamber or by other means. In the same manner also, the atmospheric pressure being modified as above described, the vapours from various liquids
20 will rise with greater facility, and may be so inhaled at increased temperatures if desired. Likewise, if needful, the air before passing into the lungs may be freed of any deleterious matters by passing it through charcoal or other substance having an affinity for those foreign matters which it is desired to free the air from. By the use of this apparatus that
25 extensive class of pulmonary diseases which owe their origin to the deficient aeration of the blood may be held in check and eliminated from the system.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed
by the said William Hills Kitchen in the Great Seal Patent Office on
30 the 21st April 1866.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WILLIAM HILLS KITCHEN, of Newcastle-on-Tyne, in the County of Northumberland, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters
35 Patent bearing date the Twenty-first day of October, in the year of our Lord One thousand eight hundred and sixty-five, in the twenty-ninth year of Her reign, did, for Herself, Her heirs and successors, give and

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grant unto me, the said William Hills Kitchen, Her special licence that I, the said William Hills Kitchen, my executors, administrators, and assigns, or such others as I, the said William Hills Kitchen, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, 5 should and lawfully might make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for "A NEW OR IMPROVED APPARATUS FOR PRODUCING ARTIFICIAL RESPIRATION," upon the condition (amongst others) that I, the said William Hills Kitchen, my executors or administrators, by an instru- 10 ment in writing under my, or their, or one of their hands and seals, should particularly describe and ascertain the nature of the said Invention, and in what manner the same was to be performed, and cause the same to be filed in the Great Seal Patent Office within six calendar months next and immediately after the date of the said Letters Patent. 15

NOW KNOW YE, that I, the said William Hills Kitchen, do hereby declare the nature of my said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This Invention consists of an arrangement for producing artificial respira- 20 tion by making the air passing into the lungs to exceed the pressure of that which surrounds the external surface of the chest, the expiration being made into a medium not exceeding the pressure of the air surrounding the external surface of the chest, likewise for varying the atmospheric pressure on the external surface of the chest, similar to that which takes place at 25 different altitudes above the level of the sea, the object which the Inventor has in view being to neutralize chronic inaction of the organs of respiration induced by sedentary modes of life, and to give expansion to the chest by a more certain method than has been hitherto employed. The arrangement which the Inventor purposes to adopt in carrying out the objects set forth 30 as above is first to insulate the whole of the body of the person using the apparatus in an air-proof chamber, which he designates by the name of an anti-sedentary couch, made sufficiently strong to bear a certain amount of atmospheric pressure. The said couch may be made of wood coated with any air-tight composition, or may be made of gutta percha or indian-rubber 35 supported by a suitable framing, or may be made of iron or other suitable air-tight material. To this couch are fitted two chambers going under the respective names of the inhaling and exhaling chambers, the air in which is put in connection with the respiratory organs of the persons using the

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apparatus by means of two tubes leading through a valve under the control of the person within the couch to a mouth-piece which is placed in the mouth. The inhaling chamber is put in connection with the external air by means of a valve. A communication is effected between this chamber
5 and the couch by means of another valve, while the couch itself communicates with the exhaling chamber by means of a third valve. If it is desired that the pressure of the air within the couch shall fall no lower than that which is required for inhalation by the person using the apparatus, the valve in the inhaling chamber is removed, and the respiratory organs are thereby
10 put in direct communication with the external air. The pressure of the air in the couch is prevented from falling below a certain point, or is regulated by so graduating the valves above mentioned between the inhaling chamber and the couch and the couch and the exhaling chamber, and by so withdrawing the air from the exhaling chamber by means of an air pump
15 or other apparatus attached to the exhaling chamber that the two valves above mentioned will always be in equilibrium. In order to produce a complete exhalation, the medium into which the exhalations take place should not exceed in pressure the air in the couch. The valve leading from the exhaling chamber to the couch is graduated in weight so that the air
20 within shall not fall below a certain pressure. The mouth-piece being placed in the mouth the exhaling chamber is so reduced by continued rarefaction by an air pump or otherwise, as stated above, that its valve is always kept in equilibrium, the valve leading from the couch to the external air being likewise kept in the same state. The person in the couch closes
25 his nostrils and opens a tap or valve, so that the mouth-piece is put in communication with the external air when an inspiration is made. If it is desired that the medium into which the expirations take place shall not fall below that which surrounds the external surface of the chest, the passage of the mouth-piece may be simply closed by the tongue, and the air passed
30 through the nostrils into the couch, or, by using the exhaling chamber without the valve, communication may be opened between the mouth-piece and the exhaling chamber; but if the valve is used in this chamber graduated in weight, then an expiration will take place into this chamber of such a complete nature as is determined by the excess of pressure in the
35 couch above that in the chamber. When it is desired that the inhalations shall take place from a medium lower in pressure than the external air, the inhaling chamber is used with its valve weighted to the desired excess of pressure of the external air above that desired to be inhaled. By simply opening and shutting the communications alternately between the mouth-

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piece and the inhaling and exhaling chambers artificial respiration is produced. By opening and shutting such communications to varying extents, the duration in time or the length of time employed in an inhalation or exhalation may be determined, or this may be done by separate valves. The air inhaled into the lungs may be very simply raised in 5 temperature by putting a bottle filled with hot water into the inhaling chamber or by other means. In the same manner also, the atmospheric pressure being modified as above described, the vapours from various liquids will rise with greater facility, and may be so inhaled at decreased temperatures if desired. Likewise, if needful, the air before passing into 10 the lungs may be freed of any deleterious matters by passing it through charcoal or other substances having an affinity for those foreign matters which it is desired to free the air from. By the use of this apparatus that extensive class of pulmonary diseases which owe their origin to the deficient aeration of the blood may be held in check and eliminated from 15 the system.

Having thus far described the nature and object of my said Invention, I shall now proceed to describe the same more minutely, and in order thereto I shall refer to the accompanying Sheet of Drawings hereunto annexed, and to the letters and figures of reference marked thereon. 20

Fig. 1 shows an external view of my anti-sedentary couch marked A, B, C, D; E is a top piece, which is made to remove in order that the person to use the apparatus may enter it. It is made to fit tightly to prevent any escape of air. The part F carries the valves O and P, as seen in Fig. 2, and G contains the valve N, Fig. 2, with its weights 25 H, H, as shown; K¹ is a vacuum gauge to ascertain the amount of vacuum in the couch. Its construction and action are too well known to require any explanation. Referring now to Fig. 2, exhibiting a partial section of an anti-sedentary couch, we find the three valves N, O, P, and the stop-cock R. The three valves communicate with each other and open into 30 their respective chambers M, L, K; M, the inhaling chamber herein-before referred to communicates with the mouth of the person through the stop-cock R by the tube *a*, and also with the chamber L through the valve O; L communicates with M, and also with the interior of the couch, by the opening *b*, also with the exhaling chamber K by the valve P; K 35 communicates with the chamber L by the valve P, and also through the stop-cock R with the mouth of the person by the tube *c*. Now, should it be intended that the person shall inhale air of the atmospheric pressure, the valve N may be removed, and it is evident that the exact pressure

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below that of the atmosphere which is required to be maintained on the external surface of the chest may be obtained and regulated by weighting the valve O accordingly. The pressure of the air in the couch is also regulated by the valve P, which communicates with the exhaling chamber, 5 so that should the warmth of the body or other causes tend to raise the pressure, the valve P opens, and equilibrium is restored. The exhalations are made into the exhaling chamber K, which is maintained at its required amount of rarefaction by means of an air pump or otherwise. To produce a complete exhalation, this pressure should not exceed the pressure 10 maintained on the external surface of the chest. The greater the difference the more complete will be the expiration. This is effected by graduating the valve P accordingly. The tap or valve R is opened, the mouth is put directly in communication with the external air through the orifice of the valve N. The expiration is made through the tube *c* into the exhaling 15 chamber K, or it may be made simply into the couch, when such a condition is required, by simply removing the mouth from the mouth-piece S.

Having now described my Invention as fully and to the best of my ability, I wish it to be understood that it is quite possible to make many 20 modifications of the details of my Invention, and yet not depart from the essential features that make it a new and useful Invention. What I consider now and claim as secured to me by Her Majesty's Letters Patent is, the general arrangement and construction of an apparatus herein-before referred to as an anti-sedentary couch, for producing artificial respiration, 25 in the manner and for the purposes herein-before referred to and illustrated.

In witness whereof, I, the said William Hills Kitchen, have hereunto set my hand and seal, this Nineteenth day of April, in the year of our Lord One thousand eight hundred and sixty-six.

30

WILLIAM HILLS KITCHEN. (L.S.)

Witness,

THOMAS MARSHALL,

48, Pitt St.,

Newcastle-on-Tyne.

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Printers to the Queen's most Excellent Majesty. 1866.

be kept at the atmosphere which is required to be maintained on the
 external surface of the chest may be obtained and regulated by adjusting
 the valve D accordingly. The pressure of the air in the conduit also
 regulated by the valve P, which communicates with the external chamber
 and that should the weight of the body or other causes tend to raise the
 pressure the valve P opens, and regulation is restored. The regulations
 are made in the external chamber K, which is maintained at its required
 amount of tension by means of an air pump or otherwise. To produce
 a complete exhalation, the pressure should not exceed the pressure
 maintained in the external surface of the chest. The greater the difference
 the more complete will be the exhalation. This is effected by gradually
 the valve T accordingly. The tap or valve H is opened, the amount is put
 directly in communication with the external air through the orifice of the
 valve N. The exhalation is made through the tube c into the external
 chamber K, or it may be made simply into the conduit, when such a con-
 dition is required, by simply removing the mouth from the mouth-
 piece S.

Having now described my invention as fully and to the best of my
 ability, I wish it to be understood that it is quite possible to make many
 modifications of the details of my invention, and yet not depart from the
 essential features that make it a new and useful invention. What I claim
 as my own and claim as secured to me by Her Majesty's Letters Patent is
 the general arrangement and construction of an apparatus herein before
 referred to as an anti-sedentary couch, for producing artificial respiration,
 in the manner and for the purposes herein before referred to and
 illustrated.

It is witness whereof, I the said William Hills Kitchen, have hereunto
 set my hand and seal, this thirtieth day of April, in the year of
 our Lord One thousand eight hundred and sixty-six.

WILLIAM HILLS KITCHEN (s.s.)

Witness my hand and seal, this thirtieth day of April, in the year of
 our Lord One thousand eight hundred and sixty-six.

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 Printed by George Thomas and William Fothergill,
 Printers to the Queen's most Excellent Majesty, 1866.

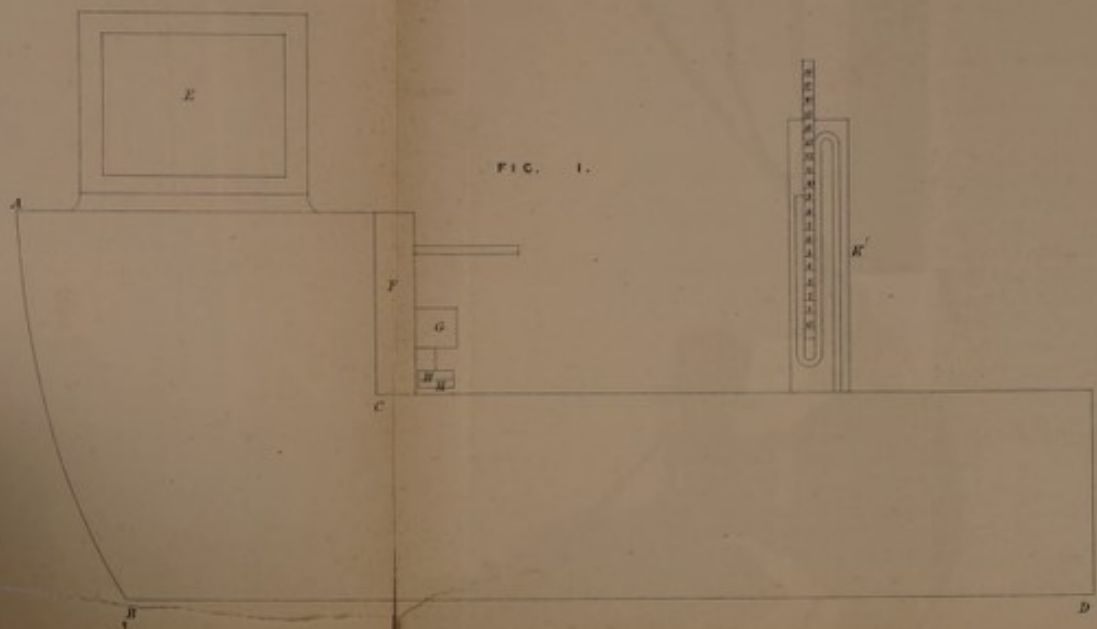


FIG. 1.

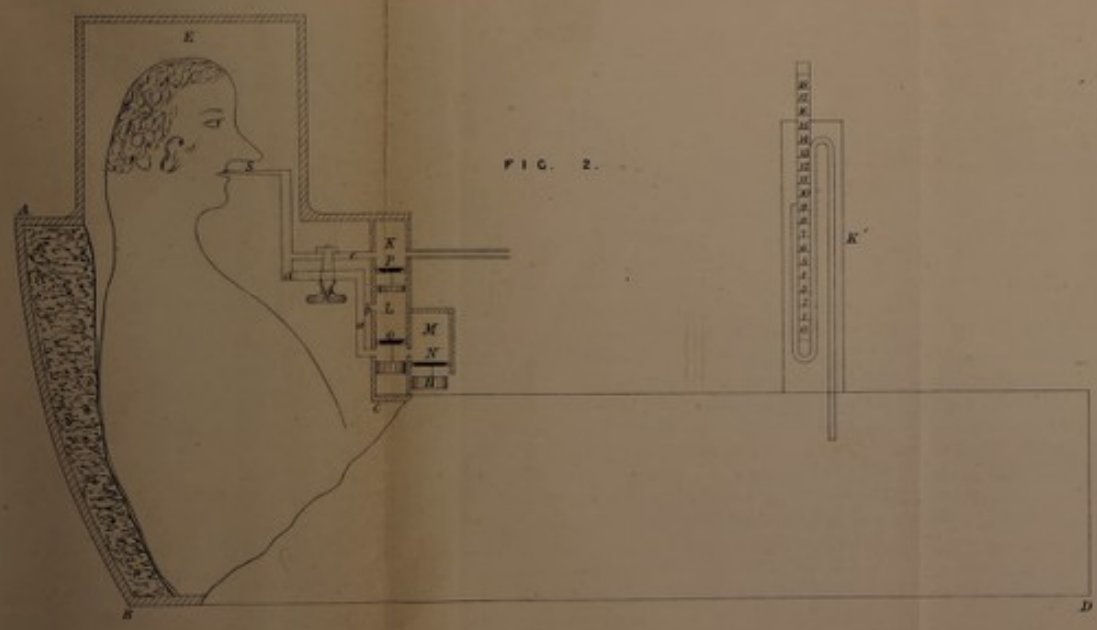


FIG. 2.

The filed drawing is not colored.

Drawn, in Stone by Malby & Co.

