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Contributors

Carrick, James.

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A.D. 1874, 29th APRIL. N° 1501.

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

OF

JAMES CARRICK.

RESPIRATORY AND INHALING APPARATUS.

LONDON:

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1874.





A.D. 1874, 29th APRIL. N° 1501.

Respiratory and Inhaling Apparatus.

LETTERS PATENT to James Carrick, of George Square, Glasgow, in the County of Lanark, Gentleman, for the Invention of "**IMPROVEMENTS IN APPARATUS FOR RESPIRATORY AND INHALING PURPOSES.**"

Sealed the 26th June 1874, and dated the 29th April 1874.

PROVISIONAL SPECIFICATION left by the said James Carrick at the Office of the Commissioners of Patents, with his Petition, on the 29th April 1874.

I, JAMES CARRICK, of George Square, Glasgow, in the County of Lanark, Gentleman, do hereby declare the nature of the said Invention for "**IMPROVEMENTS IN APPARATUS FOR RESPIRATORY AND INHALING PURPOSES,**" to be as follows:—

My Invention consists of improvements upon an Invention described in the Specification of Letters Patent granted to me and bearing date 16th March 1864. That Invention consisted in part of a respirator which was to be worn upon the mouth and was provided with inlet and outlet valves for the ingress and egress of the air respired and was

Carrick's Improvements in Respiratory and Inhaling Apparatus.

connected by a tube to an "inhaling apparatus" to be worn on the body.

Now my present Invention consists, firstly, in constructing respirators as herein-after described, so as to enable them to be worn on the body, and connecting the respirator by means of a flexible tube to a mouth-⁵ piece, which is so formed that it can easily be held between the lips and retained there while speaking, instead of connecting it to a mouth-piece covering the mouth, thereby avoiding the unsightly appearance of respirators which cover the mouth and the inconvenience of having to remove them while speaking. In making a respirator according to this¹⁰ part of my Invention I construct a frame or case of wire or perforated sheet metal over which I fix felt, flannel, or other fibrous filtering material which will intercept dust and other injurious particles. This frame or case is of a form suitable to allow of its being worn on the chest, and at the upper part I construct an air chamber, which communicates with¹⁵ the said case and through which the air inspired and expired passes; the said chamber being furnished with inlet and outlet valves, the former of which admits to the chamber the air which is drawn through the aforesaid case on its way to the mouth of the user, but prevents any of the expired air from passing back into the case. The inlet valve²⁰ allows the respired air to pass away from the air chamber into the external air, but prevents the external air from entering the said chamber, which is closed by an air-tight cover which can be removed from time to time to allow of the water resulting from the condensation of the user's breath being poured out. To this lid is affixed a flexible²⁵ tube having at its upper end a mouth-piece, which is held between the user's lips. Or instead of constructing the chamber with a moveable cover it may be furnished with a small tap through which the water of condensation may be drawn off.

When it is wished to cool or moisten the air inspired or to purify it³⁰ from noxious gases, the filtering material herein-before referred to is kept moist. This is effected by occasionally dipping the said case into water, or preferably by securing a suitably formed vessel containing water to the lower part of the said case. By this means the filtering medium is kept constantly charged with water and the air drawn³⁵ through the said filtering medium is thereby moistened, cooled, and purified.

Carrick's Improvements in Respiratory and Inhaling Apparatus.

The method of using and the action of this respirator are as follows :—
The case covered with the filtering medium is worn upon the body outside the clothes of the user, and the mouth-piece, which is connected by the flexible tube to the said case, is placed between the lips. The
5 air inspired is drawn through the filtering medium and thereby purified, it then passes to the air chamber aforesaid through the inlet valve, and thence through the tube to the mouth of the user. On the air being expired it passes back into the said chamber and thence through the outlet valve into the external air, the inlet valve closing and thereby
10 preserving the respirator from contact with the vitiated air.

My Invention further consists of the combined inhaling and respiratory apparatus, which is more especially designed to warm and to medicate the air to be inspired, and which (like the preceding apparatus) is to be worn upon the body, but under the clothes, and is constructed as herein-after described. This apparatus consists of a sheet-metal case divided by a perforated diaphragm into two compartments. In one of these is inserted, through an aperture in the diaphragm, felt, wool, or other absorbent, saturated or impregnated with any medicinal matter with which it is wished to impregnate the air to
15 be inhaled. This compartment communicates with an air chamber (furnished with inlet and outlet valves) similar to that herein-before described with reference to the respirator, constituting the first part of my Invention, which chamber also is provided with a flexible tube terminating in a mouth-piece. In the other compartment, which is
25 closed by a door of perforated sheet metal, felt, or flannel, or other suitable filtering medium is placed and secured so as to constitute the respirator, which may, if desired, be kept moist by water contained in a receptacle formed at the lower part of the compartment occupied by the said filtering medium. At each inspiration of the user air enters
30 the respirator through the perforations in the door thereof, and thence passes through the felt or flannel or other filtering medium through the perforations in the diaphragm, and thence through the medicated medium placed in the inner compartment of the inhaler, where it is impregnated with the medicinal matter used, and from which it passes
35 through the air chamber and tube, as in the respirator last described; the said air being warmed in its passage by the animal heat of the person using it.

In both the foregoing arrangements, instead of placing the inlet and

Carrick's Improvements in Respiratory and Inhaling Apparatus.

outlet valves in a chamber formed on the inhaling apparatus as herein-before described, they may be placed in the tube near the mouth-piece.

My Invention further consists of an inhaling apparatus which instead of being worn on the person may be stood on a table for the purpose of warming, cooling, purifying, or medicating the air drawn through it 5 by the user. This apparatus consists of a case made of wicker-work, perforated vulcanite, or other imperfect conductor of heat, over which is stretched felt or flannel, and to the upper part of which is connected the flexible tube herein-before described, in which and near the mouth-piece thereof the inlet and outlet valves are placed. 10

When it is wished to cool the air respired the lower part of this case is immersed in a shallow pan containing water, which being absorbed by the felt or flannel and evaporated, cools the air as it is drawn into the case, in which such air may be further cooled by ice placed in the said case, or be impregnated with any medicinal matter placed therein 15 or in the water surrounding the said case.

When it is wished to warm the air respired the apparatus is mounted over a spirit lamp. This apparatus may be provided with several tubes, so that it may be used by several people at the same time.

By constructing respirators as herein-before described, a large filtering 20 surface is provided for the passage of the air inhaled, and the difficulty of inspiration occasioned by the use of respirators of the ordinary construction is thereby obviated.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed by the said James Carrick in the Great Seal Patent Office on 25 the 29th October 1874.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JAMES CARRICK, of George Square, Glasgow, in the County of Lanark, Gentleman, send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her 30 Letters Patent, bearing date the Twenty-ninth day of April, in the year of our Lord One thousand eight hundred and seventy-four, in the thirty-seventh year of Her reign, did, for Herself, Her heirs and successors,

Carrick's Improvements in Respiratory and Inhaling Apparatus.

give and grant unto me, the said James Carrick, Her special license that I, the said James Carrick, my executors, administrators, and assigns, or such others as I, the said James Carrick, my executors, administrators, and assigns, should at any time agree with, and no others, from time to
5 time and at all times thereafter during the term therein expressed, 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 "IMPROVEMENTS IN APPARATUS FOR RESPIRATORY AND INHALING PURPOSES," upon the condition (amongst others)
10 that I, the said James Carrick, my executors or administrators, by an instrument 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
15 calendar months next and immediately after the date of the said Letters Patent.

NOW KNOW YE, that I, the said James Carrick, do hereby declare the nature of the said Invention, and in what manner the same is to be performed, to be particularly described and ascertained in and by the
20 following statement thereof, that is to say :—

My Invention consists of improvements upon an Invention described in the Specification of Letters Patent granted to me, and bearing date 16th March 1864. That Invention consisted in part of a respirator which was to worn upon the mouth, and was provided with inlet
25 and outlet valves for the ingress and egress of the air respired, and was connected by a tube to an "inhaling apparatus" to be worn on the body.

Now my present Invention consists, firstly, in constructing respirators, as herein-after described, so as to enable them to be worn on the
30 body, and connecting the respirator by means of a flexible tube to a mouth-piece, which is so formed that it can easily be held between the lips, and retained there while the user is speaking, instead of connecting it to a mouth-piece covering the mouth, thereby avoiding the unsightly appearance of respirators which cover the mouth, and the inconvenience
35 of having to remove them while speaking. In making a respirator according to this part of my Invention I construct a frame or case of wire, or perforated sheet metal, over which I fix felt, flannel, or other

Carrick's Improvements in Respiratory and Inhaling Apparatus.

fibrous filtering material, which will intercept dust and other injurious particles. This frame or case is of a form suitable to allow of its being worn on the chest; and at the upper part I construct an air chamber which communicates with the said case, and through which the air inspired and expired passes, the said chamber being furnished with inlet 5 and outlet valves, the former of which admits to the chamber the air which is drawn through the aforesaid case on its way to the mouth of the user, but prevents any of the expired air from passing back into the case. The outlet valve allows the respired air to pass away from the air chamber into the external air, but prevents the external air from 10 entering the said chamber, which is closed by an air-tight cover which can be removed from time to time to allow of the water resulting from the condensation of the user's breath being poured out. To this lid is affixed a flexible tube having at its upper end a mouth-piece, which is held between the user's lips. Or instead of constructing the chamber 15 with a moveable cover it may be furnished with a small tap through which the water of condensation may be drawn off.

When it is wished to cool or moisten the air inspired, or to purify it from noxious gases, the filtering material herein-before referred to is kept moist. This is effected by occasionally dipping the said case 20 into water, or preferably by securing a suitably formed vessel containing water to the lower part of the said case. By this means the filtering medium is kept constantly charged with water, and the air drawn through the said filtering medium is thereby moistened, cooled, and purified.

The method of using and the action of this respirator are as follows:—The case covered with the filtering medium is worn upon the body outside the clothes of the user, and the mouth-piece, which is connected by the flexible tube to the said case is placed between the lips. The air inspired is drawn through the filtering medium, and thereby purified. 30 It then passes to the air chamber aforesaid through the inlet valve, and thence through the tube to the mouth of the user. On the air being expired it passes back into the said chamber, and thence through the outlet valve into the external air, the inlet valve closing, and thereby preserving the respirator from contact with the vitiated air. 35

My Invention further consists of the combined inhaling and respiratory apparatus, which is more especially designed to warm and to medicate

Carrick's Improvements in Respiratory and Inhaling Apparatus.

the air to be inspired, and which (like the preceding apparatus) is to be worn upon the body, but under the outer clothes or garments, and is constructed as herein-after described. This apparatus consists of a case divided by a perforated or reticulated diaphragm into two compartments.

5 In one of these is inserted through an aperture in the diaphragm felt, wool, or other absorbent saturated or impregnated with any medicinal matter with which it is wished to impregnate the air to be inhaled. This compartment communicates with an air chamber (furnished with inlet and outlet valves) similar to that herein-before described with reference to
10 the respirator constituting the first part of my Invention, which chamber also is provided with a flexible tube terminating in a mouth-piece. In the other compartment, which is closed by a door of perforated sheet metal or wire gauze, felt, or flannel, or other suitable filtering medium, is placed and secured so as to constitute the respirator, which may if desired be
15 kept moist by water contained in a receptacle formed at the lower part of the compartment occupied by the said filtering medium. At each inspiration of the user air enters the respirator through the perforations in the door thereof, and thence passes through the felt or flannel, or other filtering medium, through the perforations in the diaphragm, and
20 thence through the medicated medium placed in the inner compartment of the inhaler, where it is impregnated with the medicinal matter used, and from which it passes through the air chamber and tube, as in the respirator last described, the said air being warmed on its passage by the animal heat of the person using it.

25 In both the foregoing arrangements, instead of placing the inlet and outlet valves in a chamber formed on the inhaling apparatus, as herein-before described, they may be placed in the tube near the mouth-piece.

My Invention further consists of an inhaling apparatus, which instead of being worn on the person may be stood on a table for the purpose of
30 warming, cooling, purifying, or medicating the air drawn through it by the user. This apparatus consists of a case made of wickerwork, perforated vulcanite, or perforated sheet metal or wire gauze, over which is stretched felt or flannel, and to the upper part of which is connected the flexible tube herein-before described, in which and near the mouth-piece
35 thereof the inlet and outlet valves are placed.

When it is wished to cool the air respired the lower part of this case is immersed in a pan or vase containing water, which being absorbed by

Carrick's Improvements in Respiratory and Inhaling Apparatus.

the felt or flannel and evaporated, cools the air as it is drawn into the case, in which such air may be further cooled by ice placed in the said case, or be impregnated with any medicinal matter placed therein or in the water surrounding the said case.

When it is wished to warm the air respired the apparatus is mounted 5 over a spirit lamp. This apparatus may be provided with several tubes, so that it may be used by several people at the same time.

By constructing respirators as herein-before described a large filtering surface or area of suction is provided for the passage of the air inhaled, and the difficulty of inspiration occasioned by the use of respirators of 10 the ordinary construction is thereby obviated.

Having now described the nature of my Invention I will proceed to describe the manner in which the same is to be performed, reference being had to the accompanying Drawings, and to the letters and figures marked thereon, premising that the same letters of reference indicate 15 the same parts in the several Figures of the said Drawings, and that where parts of the apparatus described with reference to and represented in the Drawings of one arrangement are represented in the Drawings of other arrangements I do not consider it necessary to repeat the description of such parts. 20

Figure 1 is a front elevation, and Figure 2 is a vertical section (taken on the line 1, 2, Figure 1) of a respirator constructed according to this part of my Invention.

A is a frame of wire and sheet metal, which frame is of a form suitable to allow of its being conveniently worn on the chest. Over this frame 25 a bag or case B of felt, flannel, or other fibrous material which will intercept dust and other injurious particles is placed, and is secured to the said frame by an elastic ring *b*, which presses the upper part of the bag B into a groove *a* formed around the upper part of the frame A. I find in practice that the cloth made by the Wandle Felt Company of a 30 mixture of sponge with wool answers well for my purpose, or ordinary felt of close texture may be used. Above the frame A and affixed thereto is an air chamber C, which communicates with the said case B by means of a short tube *c*¹ provided with a valve *c*² (termed the inlet valve). The upper part of the said chamber is closed by a lid or cover *c*³ provided 35 with another short tube *c*⁴ and a valve *c*⁵ (termed the outlet valve). On the said lid or cover is another tube *c*⁶, which communicates with the air

Carrick's Improvements in Respiratory and Inhaling Apparatus.

chamber C. To the tube c^6 a flexible tube D having a mouth-piece d at its upper end is connected. Formed on or affixed to the air chamber C are rings or staples c^7, c^7 , to which a cord (parts of which are shown at E, E,) is attached.

5 The method of using and the action of this apparatus are as follows :—The respirator is suspended from the neck by means of the cord E, and lies outside the clothes of the user, and the mouth-piece d is placed between the lips.

The air to be inspired is drawn through the filtering medium B
10 which arrests dust and other injurious particles; the said air then passes through the short tube c^1 into the air chamber C, opening the valve c^2 in its passage. It then passes through the flexible tube D and mouth-piece d , and is inspired. When the said air is expired it passes through the mouth-piece and flexible tube into the air chamber,
15 but being prevented by the closing of the valve c^2 from re-entering the bag or case B, it passes out of the said chamber by the short tube c^4 , the valve c^5 on which opens to permit of the passage of the said air, and closes when it has passed out. By this arrangement of valves air is prevented from passing to the lungs of the user except through the
20 filtering medium B through which the expired air is prevented from passing. The said filtering medium is thus preserved from contact with the vitiated air respired. The water resulting from the condensation of the user's breath collects in the air chamber C from which it may be poured occasionally, the lid c^3 being first removed.

25 Or instead of providing the said air chamber with a moveable cover it may be furnished with a small tap through which the said water of condensation may be drawn off.

Instead of the frame of wire A a case made of perforated sheet metal, or of wire gauze, may be used.

30 When it is wished to moisten or cool the air inspired, or to purify it from noxious gases, the filtering medium B is kept moist. This is effected by occasionally dipping that part of the respirator covered by the filtering medium in water, or preferably by the arrangement illustrated in Figure 3, which represents in vertical longitudinal section
35 a respirator constructed as herein-before described and illustrated in Figures 1 and 2, and provided with means for keeping the said filtering

Carrick's Improvements in Respiratory and Inhaling Apparatus.

medium moist. F is a vessel for holding water. The upper edge of this vessel is turned inward and bent down, as shown at *f*, in order to prevent the water contained in the said vessel from being spilled when the respirator is being used. The said vessel encloses the lower part of the respirator, and is held thereto by elastic bands *f*¹, *f*¹, which 5 pass over ears *f*², *f*², and *c*³, *c*³, formed on or affixed to the ends of the said vessel F and air chamber C, respectively. By this means the filtering medium covering the lower part of the frame A is kept constantly immersed in water, which by capillary attraction rises to that part of the filtering medium not covered by the water vessel F, 10 through which parts the air to be inspired is drawn, which air is thereby moistened, cooled, and purified.

My Invention further consists of a combined inhaling and respiratory apparatus which is more especially designed to warm and medicate the air respired. This apparatus is illustrated in Figures 4, 5, 6, and 7 15 of the accompanying Drawings, Figure 4 being a front view, Figure 5 a plan, Figure 6 (which is drawn of the full size) a vertical section taken on the line 3, 4, Figure 4, and Figure 7 a front view showing the case open.

The said apparatus consists of a case G divided by a diaphragm *g*¹ of 20 wire gauze or perforated sheet metal into two compartments *g*², H. The said diaphragm is provided with a sliding shutter *g*³, which covers an aperture therein, through which aperture felt, wool, or other absorbent I saturated or impregnated with any medicinal matter with which it may be wished to impregnate the air to be inhaled may be put 25 into the said inner compartment *g*². This compartment communicates with an air chamber provided with inlet and outlet valves, and a flexible tube terminating in a mouth-piece, as in the arrangement herein last described. In the other compartment (H) felt or flannel, or other suitable filtering medium *h*¹, is placed. The outer side of this compart- 30 ment consists of a hinged door *h*² of sheet metal, part of which door is perforated, or is formed of wire gauze *h*³. On the inside of the said door and near the edges thereof a tube *h*⁴ is affixed, in the upper part of which tube an aperture *h*⁵ is made, which aperture is provided with a screw stopper *h*⁶; and at the lower part of the said tube, on the side 35 next the filtering medium *h*¹, small perforations *h*⁷, *h*⁷, are made.

The method of using, and the action of this respirator are as follows:—The apparatus is suspended from the neck, and the mouth-

Carrick's Improvements in Respiratory and Inhaling Apparatus.

piece held between the lips and the teeth, the case resting on the chest, but under the outer clothes or garments. At each inspiration of the user air enters the respirator through the reticulations or perforations h^3 in the door h^2 , and thence passes through the filtering medium h^1 through
5 the reticulations or perforations in the diaphragm g^1 and sliding shutter g^3 , and thence through the medicated medium I placed in the inner compartment g^2 , where it is impregnated with the medicinal matter used, and from which it passes through the air chamber and tube as in the respirator herein-before described, the said air being warmed on its
10 passage by the animal heat of the person using it.

When it is wished to moisten the air inspired, the tube h^4 is filled with water, which passing out of the perforations h^7 , h^7 , keeps the filtering medium damp; or an arrangement similar to that herein-before described and represented in Figure 3 may be used for this
15 purpose.

Instead of placing the inlet and outlet valves in a chamber formed on the inhaling apparatus, as herein-before described and illustrated in Figures 1 to 7, both inclusive of the accompanying Drawings, they may be placed in the tube near the mouth-piece, or in the said mouth-piece,
20 as herein-after described and illustrated in Figures 10, 12, and 13. When the said valves are so arranged the air chamber C is dispensed with, and the tube D communicates directly with the inhaling apparatus or case, as illustrated in Figures 8 and 9, Figure 8 being a longitudinal section of the apparatus, Figure 1, modified according to this part of my
25 Invention, and Figure 9 being a transverse section of my combined inhaling and respiratory apparatus similarly modified.

My Invention further consists of the inhaling apparatus herein-after described and illustrated in Figures 10, 11, and 12 of the accompanying Drawings. Figures 10 and 11 represent in vertical section and elevation
30 respectively one arrangement of this apparatus, the tube h^1 and mouth-piece h^2 not being shown in Figure 11.

The object of this apparatus is to moisten, warm, cool, medicate, or purify the air drawn through it. The said apparatus consists of a case J made of wickerwork, perforated vulcanite, or of perforated sheet metal
35 or wire gauze, over which is stretched felt, flannel, or other suitable filtering medium H, and the upper part of which case is closed by a moveable cover j^1 . j^2 is a shelf, on which the matters used for cooling

Carrick's Improvements in Respiratory and Inhaling Apparatus.

or medicating the air are placed, as herein-after described. K is a tube passing through the said cover j^1 , to which tube a flexible tube k^1 is attached; k^2 is the mouth-piece affixed to the flexible tube; k^3 is a thermometer, by which the temperature of the air passing through the tube K may be ascertained. The inner end k^4 of the tube K is brought 5 down to within a short distance of the shelf j^2 in order that the air drawn into the said tube may come in contact with any medicinal matter which may be placed on the said shelf. The mouth-piece k^2 is provided with an inlet valve, consisting of a sphere k^5 , which rests on an annular seat k^6 , the motion of the said sphere being limited by the pin k^7 , which passes 10 across the said mouth-piece. The outlet valve k^8 , which is similar in construction to the inlet valve, is placed in a short tube k^9 , which communicates with the said mouth-piece. L is a dish supported on a stand M, in which dish water is put when it is wished to moisten the air. N is a spirit lamp mounted on the said stand. 15

This apparatus acts as follows :—When it is wished to cool and moisten the air to be inhaled water is put in the dish L in which the case is stood, and in addition to this if it be required still further to cool the air lumps of ice may be put into the upper part of the case J. When it is wished to medicate the air the medicinal matter if solid is put on the 20 shelf j^2 in the case J, if liquid a sponge or other absorbent is saturated with such liquid and placed on the shelf, as represented at O, Figure 8. Or if water be used in the dish L the medicinal matter may be placed therein. When it is wished to warm the air respired the lamp N is used. 25

Figure 12 is a vertical section of a modification of the inhaling apparatus illustrated in Figures 10 and 11. In this arrangement the case J (which in this apparatus is made of perforated sheet metal) is placed in an outer case P, the lower part of which may contain water, the said case being mounted on a stand M under which a lamp N may 30 be put when required.

The pipe K, illustrated in Figures 10 and 11, may be perforated, as illustrated with respect to the pipe L (Figure 12) for the purpose of drawing air between the lumps of ice when ice is used in the said apparatus. 35

The mouth-piece O represented in side elevation in Figure 12, in vertical section in Figure 13, and in plan in Figure 14 is essentially similar to the mouth-piece k^2 , Figure 10, the chief difference being in

Carrick's Improvements in Respiratory and Inhaling Apparatus.

the part *m* which is held in the mouth, which part in this arrangement consists of a plate of ivory or other suitable material *o*¹ so formed as to be conveniently held between the lips and the teeth. The parts *o*², *o*³, and *o*⁴ are capable of being unscrewed for the insertion of the spheres *o*⁵, *o*⁶, and the part *o*⁷ in which the tube *k*¹ is fixed is connected to the part *o*⁴ by a bayonet joint.

Air enters the apparatus through holes *j*², *j*³, in the lid *j*¹.

The apparatus described with reference to Figures 10, 11, and 12 may each be provided with several tubes, so that each apparatus may be used by several persons at the same time.

By constructing respirators, as herein described, a large filtering surface is provided for the passage of the air inhaled, and the difficulty of inspiration occasioned by the use of respirators of the ordinary construction is thereby obviated.

15 Having now described the nature of my Invention, and the manner in which the same is to be performed, I wish it to be understood that I do not limit myself to the precise details herein described, as the same may be varied without departing from the nature of my Invention, but I claim as my said Invention,—

20 Firstly. The general combination or arrangement of parts constituting the improved respirator herein-before described and illustrated in Figures 1 and 2 of the accompanying Drawings, that is to say, the combination of a frame covered with a permeable fabric so as to constitute a permeable case to be worn on the body with an air chamber provided with inlet and outlet valves, and with a tube and mouth-piece, essentially as described and illustrated.

Secondly. The means for keeping the filtering medium moist, herein-before described and illustrated in Figure 3 of the accompanying Drawings, that is to say, securing to the respirator a vessel containing 30 water.

Thirdly. The general combination or arrangement of parts constituting the combined respiratory and inhaling apparatus herein-before described and illustrated in Figures 4, 5, 6, and 7 of the accompanying Drawings, that is to say, a case communicating with an air chamber 35 which is provided with inlet and outlet valves and with a tube termi-

Carrick's Improvements in Respiratory and Inhaling Apparatus.

nating in a mouth-piece, the said case having two compartments, medicated matter being contained in one compartment and a filtering medium in the other compartment, which [latter compartment is or may be provided with means for keeping the said filtering medium moist.

5

Fourthly. The modification herein-before described of the apparatus illustrated in Figures 1 to 7, both inclusive, of the accompanying Drawings, that is to say, dispensing with the air chamber and the valves contained therein and substituting valves placed in the mouth-piece or the pipe thereof, essentially as described and illustrated in Figures 8 10 and 9.

Fifthly. The general combination and arrangement of parts constituting the improved inhaling apparatus herein-before described and illustrated in Figures 10 and 11 of the accompanying Drawings, that is to say, a perforated or reticulated case covered with a filtering medium, 15 the interior of which case communicates with a pipe terminating in a mouth-piece furnished with inlet and outlet valves, the said case being provided with appliances for warming, cooling, medicating, or moistening the air contained in it, essentially as described.

Sixthly. Modifying the apparatus described in the last preceding 20 claim, as herein-before described, with reference to Figure 12 of the accompanying Drawings, that is to say, placing the aforesaid perforated case in an outer case for containing water instead of in the aforesaid pan.

In witness whereof, I, the said James Carrick, have hereunto set 25 my hand and seal, this Twenty-fourth day of October, in the year of our Lord One thousand eight hundred and seventy-four.

JAMES CARRICK. (L.S.)

LONDON:

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1874.





