

**Specification of Walter Blundell : apparatus for applying freezing mixtures to parts of the human body preparatory to surgical operations.**

**Contributors**

Blundell, Walter.

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A.D. 1854 . . . . . N° 2494.

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

OF

WALTER BLUNDELL.

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APPARATUS FOR APPLYING FREEZING  
MIXTURES TO PARTS OF THE HUMAN  
BODY PREPARATORY TO SURGICAL  
OPERATIONS.

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A.D. 1854 . . . . . N° 2494.

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**Apparatus for Applying Freezing Mixtures to Parts of  
the Human Body Preparatory to Surgical  
Operations.**

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**LETTERS PATENT** to Walter Blundell, of No. 29, New Broad Street, in the City of London, Surgeon Dentist, for the Invention of "**AN IMPROVED APPARATUS FOR TREATING OR PREPARING ANY PART OF THE HUMAN BODY REQUIRING TO BE SURGICALLY OPERATED UPON, FOR THE PURPOSE OF TOTALLY OR PARTIALLY BENUMBING THE SENSE OF FEELING AT THE DESIRED PART OF THE HUMAN BODY.**"

Sealed the 9th February 1855, and dated the 25th November 1854.

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**PROVISIONAL SPECIFICATION** left by the said Walter Blundell at the Office of the Commissioners of Patents, with his Petition, on the 25th November 1854.

I, **WALTER BLUNDELL**, of No. 29, New Broad Street, in the City of London,  
5 Surgeon Dentist, do hereby declare the nature of the said Invention for "**AN IMPROVED APPARATUS FOR TREATING OR PREPARING ANY PART OF THE HUMAN BODY REQUIRING TO BE SURGICALLY OPERATED UPON, FOR THE PURPOSE OF TOTALLY OR PARTIALLY BENUMBING THE SENSE OF FEELING AT THE DESIRED PART OF THE HUMAN BODY,**" to be as follows :—

10 This Invention relates to certain improvements upon a former Invention secured to me, the said Walter Blundell, on the 11th day of August 1854,

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under the Patent Law Amendment Act, No. 1758. Now, whereas I have since found that the mode of operating, as set forth and described in the Provisional Specification of such said Invention, is in certain cases limited in its application, I propose, therefore, by this present Invention to remedy this, and to enable the freezing mixture to be applied with equal effect in all cases, 5 and this I effect in the following manner and by the following means, that is to say:—Instead of allowing the freezing mixture employed to pass direct from the vessel which contains it into the flexible bag, which is to be applied to the part to be benumbed, and to circulate through the same, as set forth in the Provisional Specification of the said former Invention, during the whole 10 of the operation; or in other words, instead of applying the freezing mixture in its intensely cold state at the commencement of the benumbing operation, the novel and peculiar feature of this present Invention consists in causing the freezing mixture to enter and pass through a vessel containing warm water or other heating medium or liquid before entering the aforesaid 15 flexible bag. By these means, the temperature of the freezing mixture, as it enters the warm water, will be raised to that of the water, said water being displaced by the pressure of the column of freezing mixture, which is above; it is thus forced from the warm water vessel into the aforesaid flexible bag through flexible tubes attached to the said bag and warm water vessel, and 20 from thence by a cock into a receptacle employed for keeping up the circulation, as before stated with reference to the former Invention. And as the said freezing mixture continues to enter the warm water, the temperature thereof and of the freezing mixture will be gradually reduced, and in like manner and in the same ratio the intensity of the freezing mixture will be 25 gradually increased as it passes into the flexible bag, the temperature of the fluid therein at the commencement of the benumbing operation being at about blood heat, and becoming gradually lowered to that of the freezing mixture. And I would observe, in conclusion, that as the length of time necessary for effecting such said gradual change of temperature will vary 30 according to circumstances, it is sufficient for the purpose of explaining this Invention, to state that this may be governed by the operator opening the induction and eduction cocks more or less.

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**SPECIFICATION** in pursuance of the conditions of the Letters Patent, filed by the said Walter Blundell in the Great Seal Patent Office on the 25th May 1855.

**TO ALL TO WHOM THESE PRESENTS SHALL COME, I, WALTER**  
5 **BLUNDELL**, of No. 29, New Broad Street, in the City of London, Surgeon Dentist, send greeting.

**WHEREAS** Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-fifth day of November, in the year of our Lord One thousand eight hundred and fifty-four, in the eighteenth year of  
10 Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said Walter Blundell, Her special licence that I, the said Walter Blundell, my executors, administrators, and assigns, or such others as I, the said Walter Blundell, my executors, administrators, and assigns, should at any time agree with, and no others, from time to time and at all times thereafter  
15 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 "**AN IMPROVED APPARATUS FOR TREATING OR PREPARING ANY PART OF THE HUMAN BODY REQUIRING TO BE SURGICALLY OPERATED UPON, FOR THE PURPOSE OF TOTALLY OR PARTIALLY BENUMBING**  
20 **THE SENSE OF FEELING AT THE DESIRED PART OF THE HUMAN BODY,**" upon the condition (amongst others) that I, the said Walter Blundell, by an instrument in writing under my hand and seal, 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  
25 within six calendar months next and immediately after the date of the said Letters Patent.

**NOW KNOW YE**, that I, the said Walter Blundell, 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 following  
30 statement thereof (that is to say):—

My Invention relates to certain improvements upon a former Invention secured to me, the said Walter Blundell, on the Eleventh day of August, One thousand eight hundred and fifty-four, under the Patent Law Amendment Act, No. 1758. Now, whereas I have since found in practice that the  
35 mode of operating, described in the Specification of my previous Patent, is not only limited in its application, but calculated in many instances to produce an unpleasant sensation to the patient, arising from the comparatively sudden application of cold to the part which is to be operated upon, I propose, therefore,

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by my present Invention, to remedy this objection, and to enable the fluid cooled by ice, or any known freezing mixture, to be applied with equal effect in most cases by the use and employment of an apparatus (which I term a "graduator"), so contrived and applied that the temperature of the part is gradually decreased from blood heat, or thereabout, until the desired benumbing effect is produced, 5 and this I effect in the following manner and by the following means, that is to say:—Instead of allowing the cooled fluid employed to pass direct from the vessel which contains it into the flexible bag or other apparatus which is to be applied to the part to be benumbed, and to circulate through the same, (as set forth in my said former Specification of the Eleventh of August, One 10 thousand eight hundred and fifty-four,) during the whole of the operation; or in other words, instead of applying the cooled fluid in its intensely cold state at the commencement of the benumbing operation, the novel and peculiar feature of my said present Invention consists in causing the cooled fluid to enter and pass through a vessel (which I call a "graduator"), containing warm water or 15 other suitable heated fluid or medium, before entering the aforesaid flexible bag, &c. By these means, it will appear obvious that the commingling of the cooled fluid with the warm will have the effect of reducing the temperature of the one and raising that of the other, and this in a gradually increasing ratio; but since the cooled fluid as it passes through the graduator is continually 20 displacing the warm water or other suitable heated fluid or medium, the effect will be to convey a gradually cooled mixture to the part to be operated upon. And I would observe, that as the length of time necessary for effecting such said gradual change of temperature will vary according to circumstances, it may be governed by regulating the rapidity with which the cooled fluid is 25 allowed to pass through the graduator.

And in order to explain my said Invention as completely as possible, I now proceed to describe the best means I am acquainted with for carrying the same into practical effect, reference being had to the illustrative Drawing hereunto annexed, and to the numeral figures and letters of reference marked 30 thereon respectively, as follows:—

## DESCRIPTION OF THE DRAWING.

Figure 1 represents a side view of an apparatus constructed according to my former Invention with my present improvements applied thereto; Figure 2 is a section of the graduator. At each of the foregoing Figures I employ 35 similar letters of reference to denote corresponding parts, in so far as such parts appear or can be seen at each of the said Figures respectively. At Figure 1, A is the refrigerator, to the cock *a* of which the elastic tube B is

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attached. This tube B leads to graduator C (exhibited at Figure 2), the construction of which is as follows :—C, C, is a metal vessel (to contain warm water or other suitable heated fluid or medium), furnished with a lid *b, b*. To this lid are attached the worm *c, c*, and the cock *d, d*, in connection  
5 therewith, as also the cock *e, e*, connected to the elastic tube D, leading to the flexible bag or other apparatus to be applied to the part to be benumbed. *f, f*, is a cock to connect the tubes B and D when the cooled fluid is not required to pass through the “graduator.” With the apparatus or “graduator” constructed as above I operate as follows :—The vessel A being charged with  
10 the cooled fluid, and the vessel C with the heated fluid, the flexible bag or other apparatus, referred to in my former Specification, which is connected by the tube D to the cock *e* is applied and closely pressed against the part to be benumbed. The cocks *a, d, e*, and G are then opened, and the cooled fluid from the vessel A passes along the tube B and through the cock *d* and  
15 worm *c* into and through the graduator, and from thence through the flexible bag or other apparatus by the cock *e*, and finally passes off through the cock G into the vessel H. As the liquid continues to flow, the temperature thereof becomes gradually reduced to that of the cooled fluid in the vessel A. The cock *f* may then be opened, and the cocks *d* and *e* closed, so as to establish a  
20 direct communication between the refrigerator A and the flexible bag or other apparatus, by which the desired benumbing effect is produced. The speed at which the liquid flows, and consequent rapidity of diminution of temperature thereof, may be regulated by opening or closing the aforesaid cocks, or by pinching the tube between the finger and thumb.

25 Having thus described the nature and object of my said Invention of “an improved apparatus for treating or preparing any part of the human body requiring to be surgically operated upon, for the purpose of totally or partially benumbing the sense of feeling at the desired part of the human body, together with the best means I am acquainted with for carrying the same into  
30 practical effect, I would remark, in conclusion, that although I have described and represented a convenient form of “graduator” for effecting the objects of my present Invention, I do not intend to limit or confine myself to the precise form of such said graduator as above described and represented, so long as the principle thereof be retained; but what I claim is, the use and employment of  
35 a graduator in combination with the refrigerator, (referred to in my former Specification of the Eleventh of August, One thousand eight hundred and fifty-four,) for the purpose of decreasing the temperature of the part to be operated upon gradually from blood heat, or thereabout, until the desired benumbing effect is produced, as above particularly described, instead of

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applying the cooled fluid direct from the refrigerator to the part to be benumbed, as described in the Specification of my former Patent, dated the Eleventh of August, One thousand eight hundred and fifty-four, No. 1758.

In witness whereof, I, the said Walter Blundell, have hereunto set my hand and seal, this Twenty-fourth day of May, in the year of our Lord 5 One thousand eight hundred and fifty-five.

WALTER BLUNDELL. (L.S.)

Witness,

J. R. QUINTON,

1, Pavilion Colonade,  
Brighton.

10

LONDON :

Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,  
Printers to the Queen's most Excellent Majesty. 1855.

*Invention of an improved apparatus for treating or preparing any part of the human body requiring to be surgically operated upon for the purpose of totally or partially benumbing the sense of feeling at the desired part of the human body.*

FIG. 1.

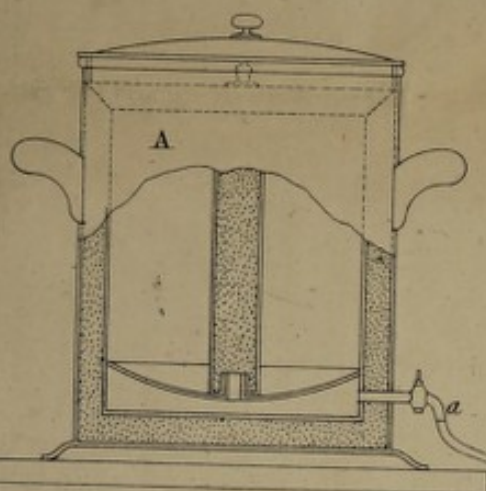
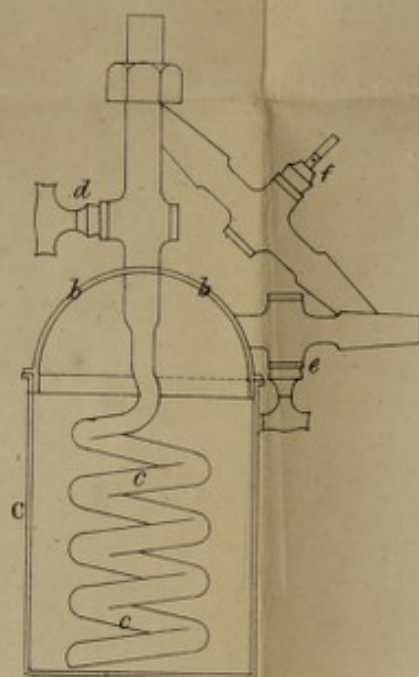
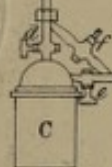


FIG. 2.



B



D

F

G

H

*The filed drawing is partly colored.*

Drawn on Stone, by M. & S. & Sons.

