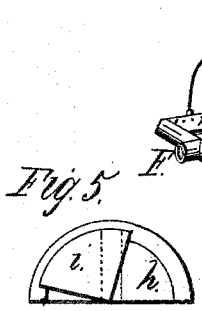
J. H. Ross,

Vapor Bath,

No. 3,996. Patented Apr. 16, 1845.

Fig. 5.



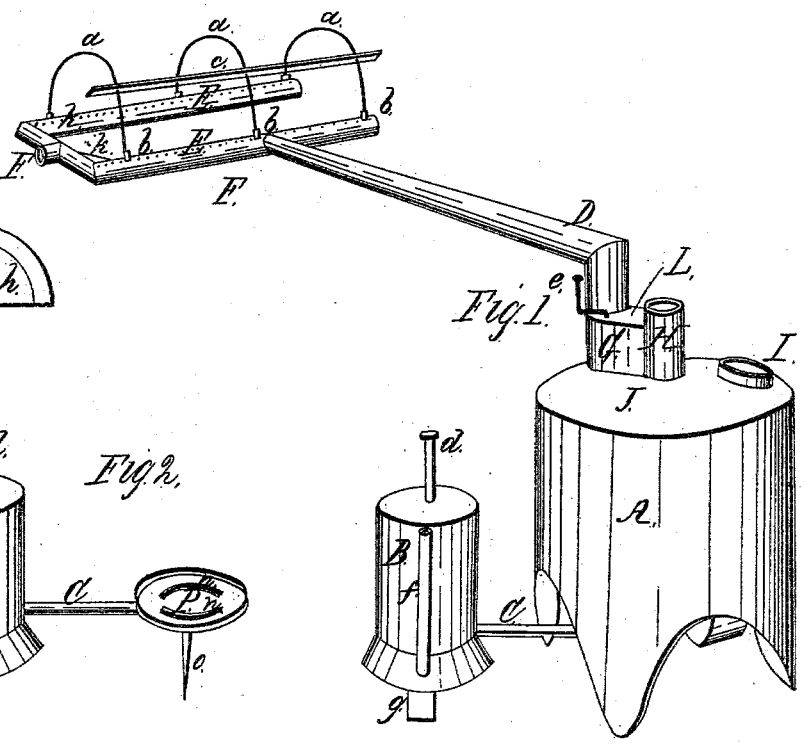
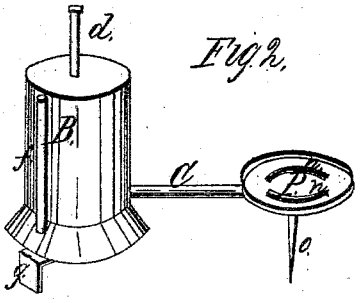


Fig. 1.

Fig. 2.



Inventor;
Joel H. Ross.

UNITED STATES PATENT OFFICE.

JOEL H. ROSS, OF NEW YORK, N. Y.

VAPOR-BATH.

Specification of Letters Patent No. 3,996, dated April 16, 1845.

To all whom it may concern:

Be it known that I, JOEL H. ROSS, of the city and county of New York, in the State of New York, have invented a new and useful Apparatus for Giving Hot-Air and Vapor Baths, and that the following is a full and exact description of the construction and operation thereof, which I call a "hot-air and vapor bathing apparatus."

This apparatus consists of a fountain to contain the combustible fluid to be used, with a burner attached at which the fluid is to burn; a boiler to contain the water by which the steam is to be generated; a frame which is to be placed around the patient to receive the bath, and a pipe to conduct the vapor and hot air from the boiler to the frame.

Figure 2, of the drawings represents a perspective view of the fountain with the burner attached, and Fig. 4, is a sectional drawing of the fountain.

B is a cylindrical vessel about four inches in length, and three inches in diameter. The interior of the vessel B is divided into two apartments or chambers by the horizontal partition *p* so that the lower chamber is about three quarters of an inch in depth; the upper chamber communicates with the lower chamber by means of the tube *q* say half an inch in diameter, which extends from the upper chamber through the partition *p* and dips into the lower chamber about half an inch.

C is a small horizontal tube extending from the lower chamber to any convenient length, say eight inches where the end turns up, and on this end is soldered the concave pan or burner P with a hole in the center corresponding with the orifice of the tube C, by which it communicates with the said lower chamber.

o is a leg to support the pan or burner.

r is a small tube furnishing a communication for the passage of external air into said lower chamber.

d is a rod made of iron or other metal, passing perpendicularly through the cylindrical vessel B at or near its center; this rod is inclosed by, and works in a tube, made so as not to admit the passage of air into the chambers through which it passes; a screw is cut on the lower end of this rod, which works in and passes through a small metallic nut soldered fast to the bottom of the cylindrical vessel B. The vessel B is supported by a metallic crosspiece, the ends of which are bent at right angles, so as to form the legs *g*—say half an inch in length; the lower end of this rod *d* rests upon this cross piece, and is used to elevate and depress the vessel B. On the opposite sides of the vessel B are soldered two small tubes or grooves *f*, through which pass two small metallic rods which are attached to and extend perpendicularly from the cross-piece above described, so that the cylindrical vessel, sliding upon and steadied by these rods, may be elevated or depressed to any required position upon said cross-piece, by means of turning the screw rod *d*. *s* is an orifice or tube through the bottom of the vessel B, for the purpose of supplying it with alcohol. This part of my apparatus is used for heating or boiling the water in the boiler A, and may be made of tin, copper or any other suitable metal; the combustible to be used is alcohol. To supply the chambers with alcohol I invert the vessel B, and pour the alcohol through the orifice *s* which passes through the tube *q* into the upper chamber above described; when this chamber is full I close the orifice *s* and reverse the vessel B, placing it in the position, as represented by Fig. 2; the alcohol will then flow back from the upper into the lower chamber through the tube *q*, while the atmosphere will at the same time pass from the lower to the the upper chamber through the same tube, until the surface of the alcohol in the lower chamber has reached the lower end of the tube *q*, or raised a little above it. The alcohol will then remain at this height in the lower chamber until it is all exhausted from the upper chamber, for as it is carried off through the tube C to support the combustion, it will be supplied from the upper chamber through the tube *q;* when it is all exhausted from the upper chamber, it should be again filled. The alcohol flowing through the horizontal tube C is discharged upon the concave pan P through the small hole in the center of the pan, communicating with the orifice of the tube C, where on being ignited it burns.

The quantity of alcohol on the pan and consequently the extent of the surface of the alcohol undergoing combustion, and the size of the flame are regulated by raising or lowering the cylindrical vessel B, which is done by turning the screw rod *d;* if a larger flame be required the rod *d* must be turned

so as to elevate the vessel B, when the alcohol seeking a level, will flow out in a greater quantity upon the frame or burner P; if a less flame be required the process should be reversed, when the surplus quantity of alcohol will flow back from the pan or burner to the chamber, and the flame will be proportionably diminished, the size of the flame corresponding with the surface of the alcohol upon the concave pan or burner; this effect may however be produced also, by raising or lowering the pan or burner P. The pan or burner P may be a simple conconcave pan with only the small orifice in the center, communicating with that of the tube C, but it is better in order to supply air and make the combustion more perfect, that the pan should be made with one or more circular openings *n*, *n*, say one inch from the center, separated at one or more points, so that the alcohol may flow around them upon the pan, the edges being turned up so as to prevent the alcohol from running through said openings. The advantage of this part of my apparatus is to produce a uniform flame of any size required by causing a continuous and uniform flow of a greater or less qantity of alcohol upon the pan or burner P; the quantity upon this concave pan regulating the extent of the surface of the alcohol undergoing combustion, and consequently the size of the flame.

Figure 1, represents the boiler with the fountain and burner, frame, and pipe attached; Fig. 3 is a sectional drawing of the boiler.

A is the boiler which consists of three parts or vessels A, *v*, and *w*, and is constructed in the following manner: Beginning with the interior *w* is a conical vessel or a cylinder with a conical top, about four inches from the apex to the base, and about eight inches in diameter at the base; this is placed within another vessel *v*, of a similar form, whose diameter is sufficient to allow a space of about three eighths of an inch between the two; these are placed with their bases downward, the bottom of the vessel *w*, is closed, the conical top of the vessel *v* terminates with a pipe or chimney, one and a half inches in diameter; the bottom of the vesssel *v* is open and extends about five and a half inches below the bottom of the vessel *w*, being scalloped out in several places, so as to admit of a free circulation of air, to supply the combustion when in operation. The scallops extend up about three inches from the bottom; the edge of this scalloped-shaped bottom of the vessel *v*, is turned out one quarter of an inch to meet and be soldered fast to another cylindrical vessel A still outside of this and with a bottom of a similar shape, and of sufficient diameter to form a space between the two of three eighths of an inch, which space is to be filled with water. The points formed by the scallops serve as legs to support the boiler, said legs should be of sufficient length to raise the bottom of the vessel *w* at least, five inches above the pan in which the alcohol burns, so that the combustion may have a sufficient supply of air, A, which is the outside cylindical part, or main exterior of the boiler, is ten inches high. The interior of the internal vessel *w*, and the space formed between the vessel *v*, and the outside cylindrical vessel A are the apartments to be filled with water. A communication between these two apartments is formed by means of one or more small tubes *x*, *x*, at or near the bottom of the vessel *w*. There is also a communication between these two apartments near the top, by means of the tube *y*, so that the steam, at the surface of the water, may pass from the interior of the vessel *w*, to the apartment between the vesssels *v* and A, from which it escapes through the steam pipe S, or the hot air pipe H as hereinafter described. The pan or burner being placed under the boiler, as represented by Fig. 1, the hot air and flame from the burning alcohol passes through the space formed between the two vessels *v* and *w*, into the hot air pipe H, where it may be combined with the steam or vapor, as hereinafter described.

The dome cover or top of the boiler J is perforated by two pipes H and S, each, one and a half inches in diameter, and extending two or three inches above the cover; H is in the center and is a continuation of the conoidal vessel *v*, before described, and through which passes dry hot air; S which is an inch and a half from the hot air pipe communicates with the water apartments, and through this escapes pure vapor or steam. To combine the two when required, viz: hot air and steam, there is a semicircular opening in the cover between the two pipes intersected in the middle by a strip one eighth of an inch wide, which converts it into two quarters of a circle *h* and *t*, as represented by Fig. 5 of the drawings, the diameter of whose circle is about two inches. A valve *i* of the form of these openings and a little larger is made to turn on a pivot placed in the center of the circle, so as to close either one or the other, or a part of each as may be desired, so that in all cases an opening must be left for the escape of the steam, which renders it perfectly safe. This opening may be of any other form than that of a quarter of a circle, provided the valve corresponds with them in form. Around these openings *h* and *t* is a hoop G an inch wide connecting the two pipes, and is soldered fast to the top of the boiler, which hoop has also a cover L, soldered fast and made steam tight, through this cover a wire, which is attached to the valve, and which turns it, passes and is bent twice at right

angles to form the crank *c* with which to turn it. Between these openings *h* and *t*, is a partition under which the valve slides. These openings communicate with the pipes H and S, *h* communicating with the pipe H, and *t* with the pipe S, so that by turning the valve and closing the opening *t*, the steam is thrown into the hot air pipe H, and the hot air and the steam or vapor is thus combined, and by turning the valve so as to close the opening *h*, pure steam or vapor will be discharged through the pipe S, and hot air through the pipe H. When it is required to give a bath of hot air, or hot air and steam combined, the conducting pipe D should be placed upon the pipe H, when a bath of steam or vapor only is required, it should be placed upon the pipe S, and the opening *h* should be closed by the valve. The boiler has also another opening I through the top of any convenient size, through which it is supplied with water; this when in operation should be closed by a cork. This part of my apparatus may be made of any suitable metal, copper being the best. The frame R is for the bed of the patient, and is constructed as follows—Two cylindrical tubes E, E, made of tin or other metal, one inch in diameter, and about four feet and three inches long, with one end closed and the other open; the open end made to fit into another tube F of the same diameter, into which it is inserted at right angles, so as to be taken apart when desired to render it more portable. The cross or foot piece F is about two feet and six inches in length. To this tube, which lies on both sides of the patient, and also below his feet, is attached the conducting pipe D at any convenient point, which conducts the steam or hot air from the boiler A into said tubes E, E, F, and diffuses it around the patient by means of small perforations or holes in the upper part of the side tubes E, E, as they lie upon the bed around the patient; the foot piece has no perforations, the feet being more liable to be burned. To prevent the metallic tube from burning the patient, it may be covered with woolen cloth, except at the upper surface where the perforations are situated. Three bows or hoops *a*, *a*, *a*, made of iron rods of any convenient size, say one quarter of an inch in diameter, whose perpendicular height is about one foot and three inches, stretch across over the patient, from one side tube to the other, to which they are attached by means of small pipes or sockets *b*, *b*, *b*, an inch or two long and soldered fast to the tubes; the end of said bows setting into said pipes or sockets, so as to be taken out at pleasure. These bows may be made with joints to render them more portable, and should also be connected together at the top, by means of a small rod *c* having holes in it through which the bows pass, and which correspond to the pipes or sockets on the side tubes, into which the ends of the bows are inserted. There may also be added, for the purpose of steadying the frame, two small, movable, wire braces *k*, *k*, in the corners of the side and end tubes. This frame is made so as to be taken apart in order to render it more portable. When a patient is to receive a bath, he should lie upon a bed with the frame R, covered with oil cloth, or other suitable substance to retain the steam, placed over him, the burner is then placed under the boiler, and the conducting pipe D may be connected with either the hot air, or steam pipe, according as the hot air alone, or the steam and hot air combined, or the steam alone is required, the quantity of each to be regulated, either by altering the size of the flame, or by turning the valve, as above described. The large amount of surface to which the water is exposed in the boiler, will cause it to boil very quickly after the flame is placed under it.

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

The combination of the boiler A with the steam and hot air pipes S and H having the communications *t* and *h* between them regulated by the valve *i*, the whole being constructed and operating as above described.

I do not however intend to be understood as confining myself to the use of any particular metal, in the construction of my said apparatus, nor to the precise dimensions of the several parts thereof, as above mentioned; these may be changed according as circumstances may require.

In testimony whereof, I the said JOEL H. ROSS hereto subscribe my name in the presence of the witnesses whose names are hereto subscribed on the eleventh day of February in the year of our Lord, one thousand eight hundred and forty five.

JOEL H. ROSS.

Signed in our presence:

GEO. GIFFORD,

CAMBRIDGE LIVINGSTON.