THE SANATORY TENT AND ITS USE IN THE TREATMENT OF PULMONARY TUBERCULOSIS.

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THE cure of consumption to-day rests absolutely upon one great factor in treatment, and that is—outdoor air. Any method by which a consumptive can breathe outdoor air, day and night, without exposure and without fatigue, and surrounded by the comforts, or even luxuries so necessary to the invalid's existence, should be warmly embraced by all who are interested in the cure of this terrible disease.

Such a method I believe I have devised by the use of my Sanatory Tent, which has been the result of considerable study and much practical experience during the last ten years. It seems to be a strong impression in most lay, and some professional, minds, that if the windows of an ordinary room are opened wide, all the conditions of ventilation are then sufficient for the pulmonary invalid. This is a great mistake and has undoubtedly caused many unnecessary deaths. Window ventilation of a room does not cause as rapid an air interchange as it should, for several reasons. If such a window faces the wind the air is forced into the room, but vitiated air is not forced out; while, if the wind is from the other direction or blowing away from the open window, the air interchange depends entirely upon suction. If two windows are used opposite each other a strong draught is created, while still the corners of the room collect stagnant air.

On a piazza conditions are more favourable, but even here much remains to be desired. If the piazza has a roof and side curtains, these curtains have to be lowered in stormy or windy weather; there is no outlet in the roof for foul air to escape, and we are practically imitating the bad features of a room under the impression that we are living outdoors. This does not apply to every porch or piazza, but is true of many. On open porches, such as invalids sit upon during the daytime, the difficulty is that they are too light, windy or cold, and if a rest is needed, or if on any pretext the house is entered, the temptation to be warm and comfortable is so hard to resist that much valuable time is lost.

These defects of room and piazza ventilation, of course, are obviated to a large extent in properly equipped sanatoria, and the results of these institutions in curing tuberculosis leave nothing to be desired. But a very small percentage of tubercular cases are ever treated in sanatoria; and I am speaking of that vast number of invalids who are trying to get well under the direction of a physician in their own homes, or in boarding houses or hotels at some health resort. Such cases we all know are very hard to control. In a sort of a perfunctory way, we tell them to live outdoors and be in the open-air as much as possible, and the actual result is, that out of twenty-four hours about four to six are spent on the piazza and the rest indoors. We ought to make a strong effort to utilise every hour of the twenty-four. Sleeping or awake, such patients should constantly inhale fresh outdoor air. The only way to achieve this is to arrange so that they will take it unconsciously and not as a task to be performed like a lesson learned. By far the best way in climates at all favourable, in my opinion, is to have them live in a sanatory tent, where they are surrounded by their comforts, where they can go to bed or sit up, where they do not have to depend on opening any windows for good fresh air, and where, if they are cold, they do not have to be loaded down by furs, with a hot bottle

between their feet, but can live in a temperature of 60° or 70° with the perfect assurance that the air interchange is as rapid as if they were actually outdoors. This, to me, is a very essential point, and I have found that in Colorado it is practicable, and cures cases of tuberculosis that were doing badly when living in rooms and sitting on porches daily.

The invention of the sanatory tent was a slow process of evolution from a primitive and simple form which I copied from the Ute Indians. I noticed that in their "tepees" of

skin the ventilation was nearly ideal. The reason for this was, they used a conical tent with a hole in the point of the top for the escape of smoke and plenty of space around the lower edge, where the tent rests upon uneven ground, for air to enter it. In this way the "tepee" acts like an inhabitable

chimney or fire-place, and, although in such an Indian home there are, of course, atrocious odours of all kinds, I have noticed that the actual ventilation is much better than in ordinary tents generally used by invalids.

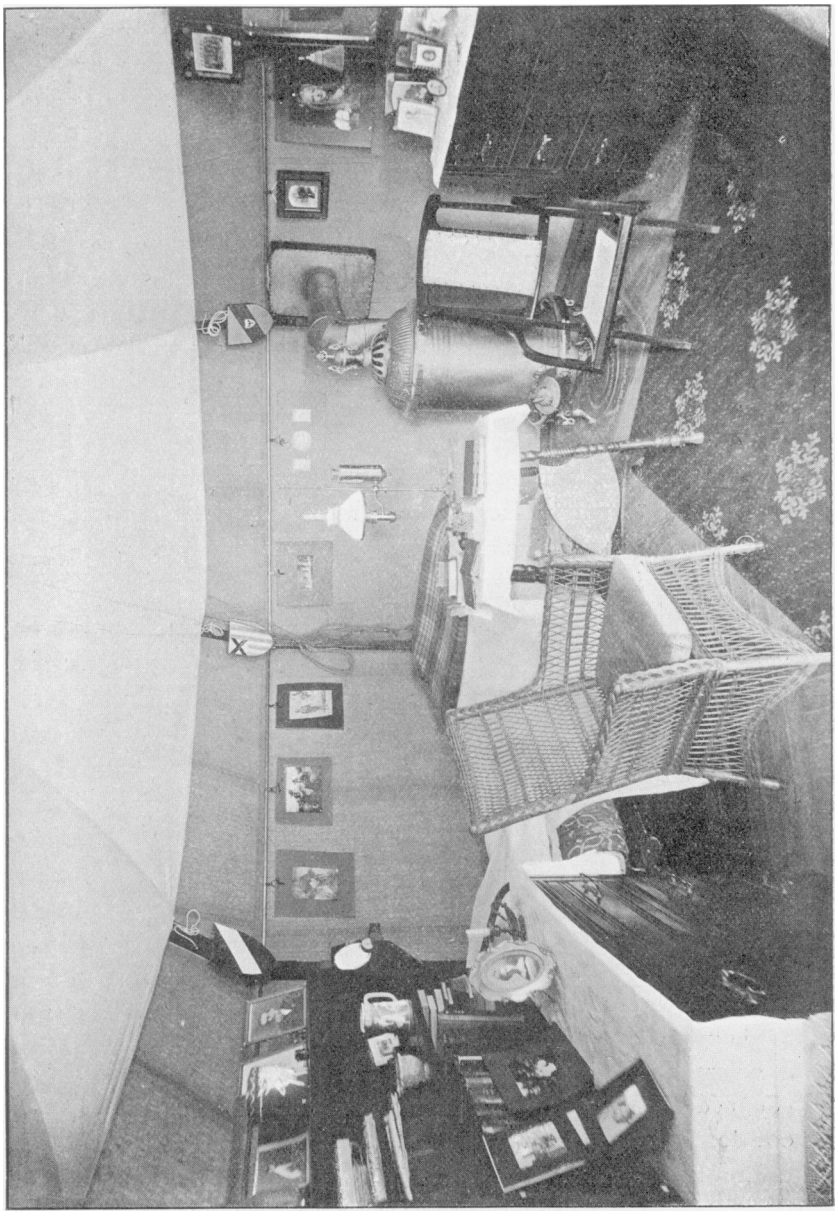
Taking this hint from the Indians, I constructed a tent of canvas built like an Indian "tepee," which answered the purpose fairly well. I next used a circular floor with an open space all about the edge for the air to enter, still retaining the opening at the top of the tent for the heated and bad air to pass out. My tent, as now made, is of dark khaki twelve-ounce duck, stretched over a six-sided framework of wood, without any centre pole and without pegs and guy-ropes, so that it stands firm, like a house. The floor is raised eight inches from the ground, and is in six sections, so that it can be easily moved. The lower edge of the wall is fastened several inches below the floor, and one inch out from it all around; this is to insure at all times an inflow of air that is gradual and without draughts, since this inch space in a circular tent represents an area of 520 square inches, and the hole in the top for overflowing air has an area of some 177 square inches. In this way the tent cannot be closed, and is ventilated automatically and constantly. In other words, this is a circular tent with the bottom of the canvas forming a circle around the wooden floor, and also extending a little below. The open space between the floor and the walls of the tent allows air to flow in at all times, while the hole in the apex, or top, allows air to flow out all the time. In this way the tent always ventilates itself day or night, whether the door is shut or not, whether the interior is heated or not, or in any weather. As the air has to turn a corner to enter the tent, it cannot come as a draught, and as it passes in through all the inch space encircling the floor, it enters slowly and without force, being evenly distributed, but coming through, collectively, a large area. There are also small shutters so constructed that they can partially close the opening from within the tent in case of very high winds. The

opening at the top of the tent is covered by a zinc cone which can be controlled by pulleys and rope within tent, in stormy weather being drawn to within an inch of the tent roof.

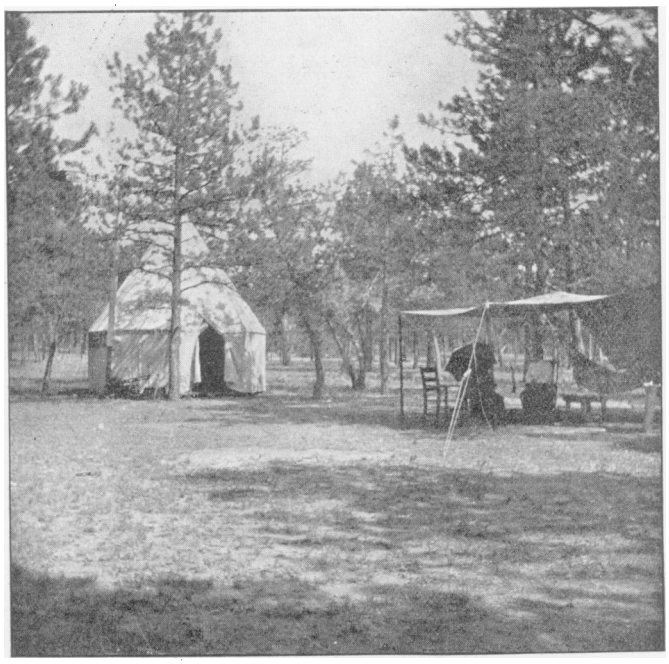
My tents are heated by central draught circular stoves which burn either wood or coal, and can be so regulated as to keep a good fire without care for ten hours. Even in zero weather the tent can be kept perfectly comfortable to dress or undress in, or to sit still and read. The stove is of such a size as to thoroughly warm the tent under any conditions, and at the same time it is impossible to overheat the air or interfere with ventilation. The more heat used, the greater the displacement of heated air upward, and a more rapid interchange of air at once occurs. As the heated air can escape at the top, the fresh air can always enter at the bottom of tent. This is automatic and is not under the control of the invalid. These facts I wish to emphasise, as they are of very great importance. The average invalid has an aversion to ventilation and will shut windows and in other ways embarrass the inflow of fresh air. In the sanatory tent it is impossible to do this as they are ventilated automatically. The stove-pipe passes out through the wall of the tent and by an elbow-joint is carried upward to the height of the tent. It should be made of galvanised iron, and can be guyed in place; it must not be below the top of the tent in order to insure good draught, and, in burning wood, to lessen danger from sparks.

A small window which does not open is used in these tents. It is placed horizontally and is 1 ft. by 6 ft.

It is most essential to have this tent furnished as completely and as comfortably as a bedroom. A proper bedstead (preferably of iron) with a thick mattress and plenty of covers; a shelf with hanging curtains on both sides and ends, for hanging clothes; a washstand and bureau; if possible, a commode; a box for coal and wood; a shelf for bottles and one for books; one or two good rugs on the floor; a steamer-chair; an armchair, and a table for writing. These need not

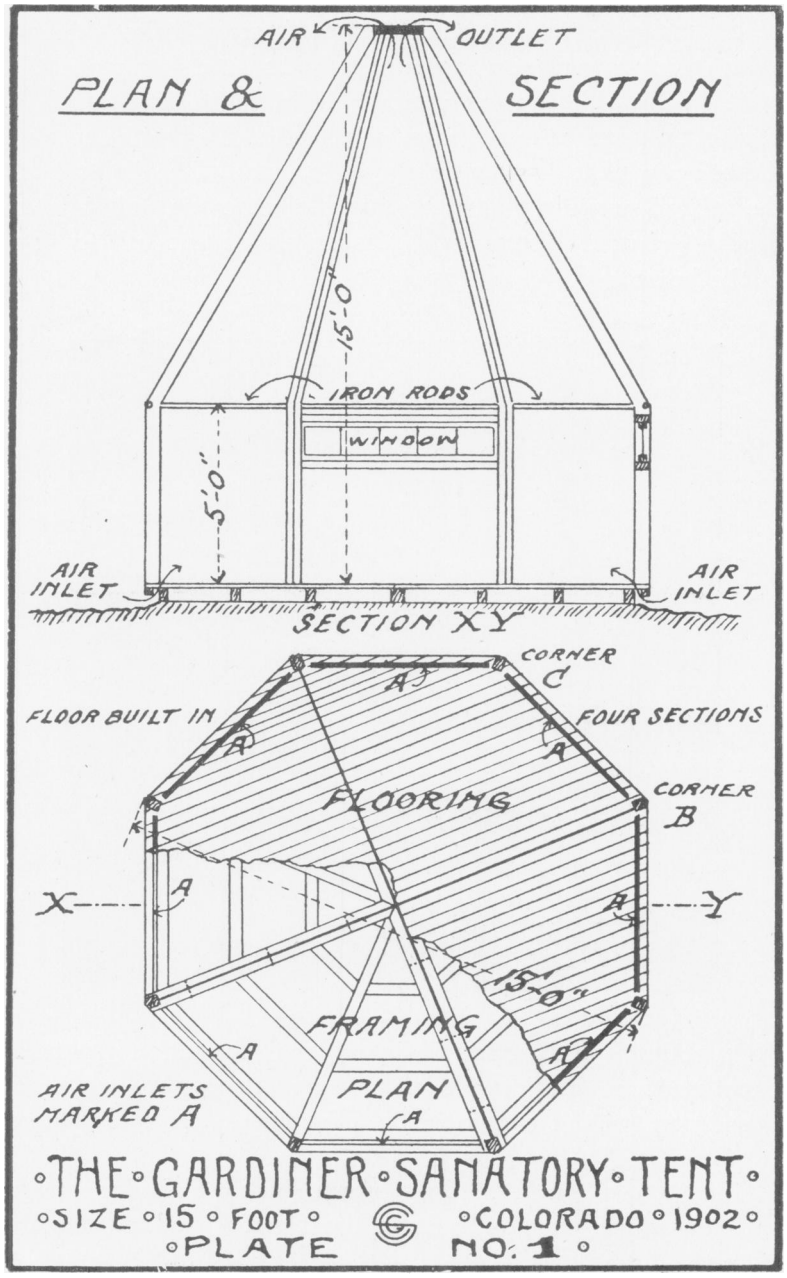


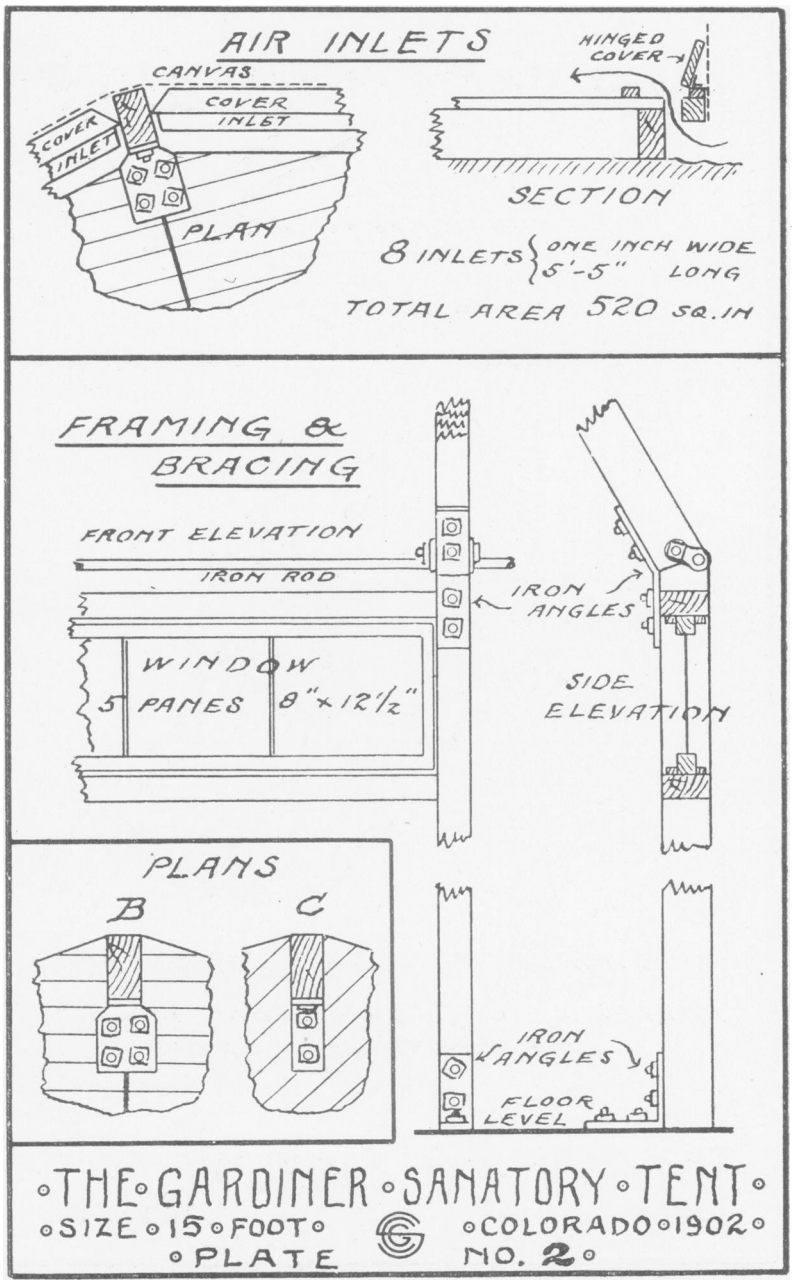
be expensive, but simple and strong. A scrap-basket, broom, a dust-pan, a hammer and some nails, and a little saw frequently come in useful. In come cases I add a little zinc-lined box having two compartments, one of which is filled with ice and the other used to keep milk, eggs, &c., cool. The lighting of the tent, if possible, should be by an electric wire taken from a near-by house; there might also be an electric bell to ring in the house.

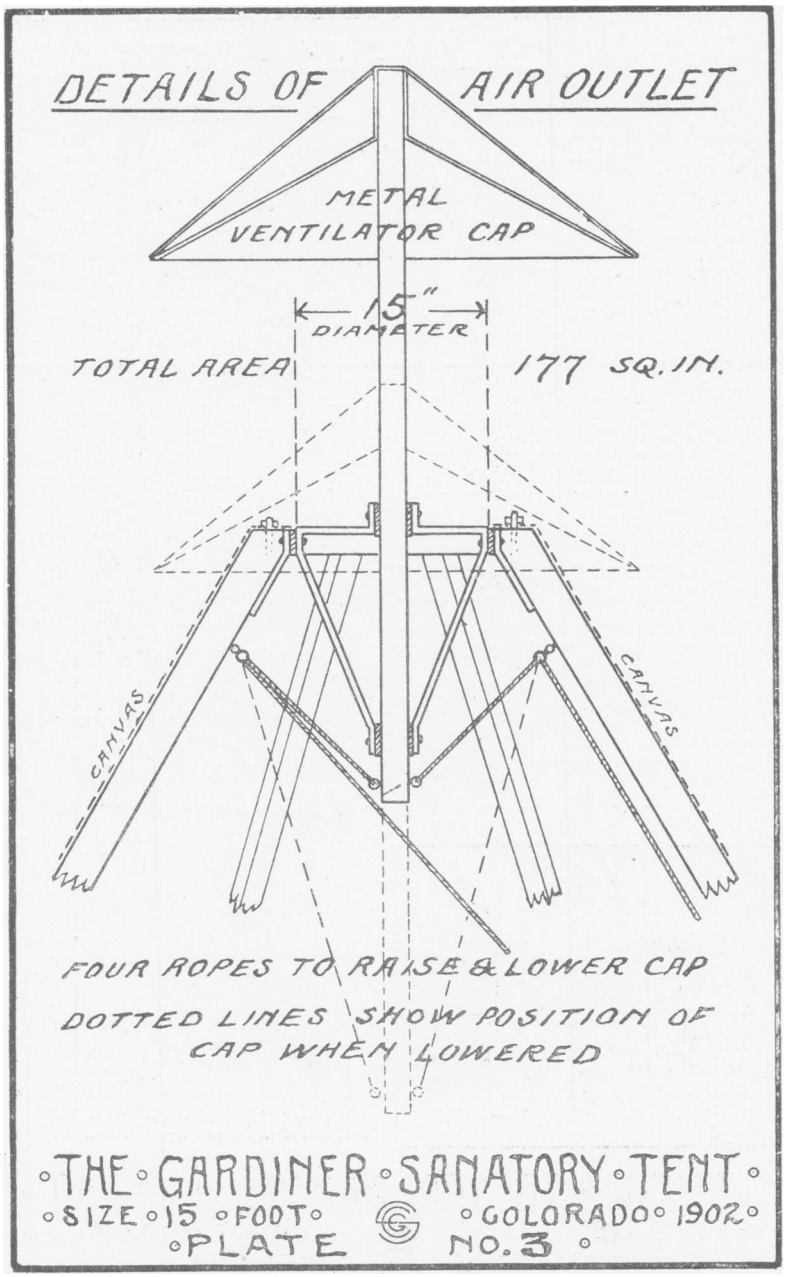


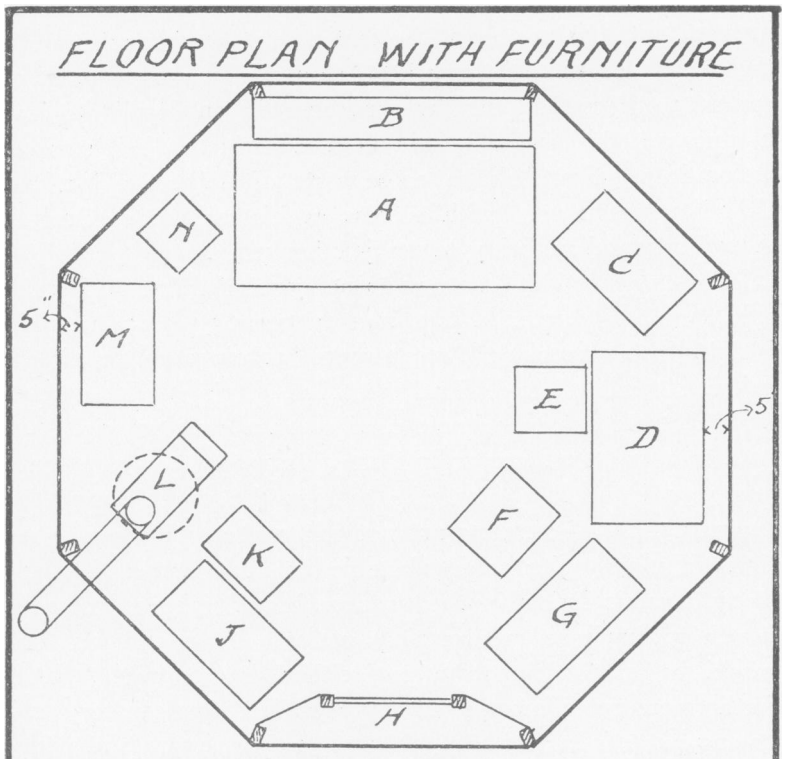
In addition to the furniture belonging to the tent, I generally have made to use outside an awning, 12 by 10, stretched upon four uprights under which a hammock, chair and table can be placed.

The tent is made of dark brown duck which does away with the white glare of light in the morning so disagreeable


AIR OUTLET
PLAN & SECTION
15'-0"
IRON RODS
WINDOW
5'-0"
AIR INLET
AIR INLET
SECTION XY
CORNER C
FLOOR BUILT IN
FOUR SECTIONS
FLOORING
CORNER B
X
Y
15'-0"
FRAMING
AIR INLETS MARKED A
PLAN
THE GARDINER SANATORY TENT
SIZE 15 FOOT
COLORADO 1902
PLATE NO. 1


AIR INLETS
CANVAS
COVER
INLET
COVER
INLET
PLAN
HINGED COVER
SECTION
8 INLETS { ONE INCH WIDE 5'-5" LONG
TOTAL AREA 520 SQ. IN
FRAMING & BRACING
FRONT ELEVATION
IRON ROD
WINDOW
5 PANES 8" × 12½"
IRON ANGLES
SIDE ELEVATION
PLANS
B
C
IRON ANGLES
FLOOR LEVEL
THE GARDINER SANATORY TENT
SIZE 15 FOOT
COLORADO 1902
PLATE NO. 2


DETAILS OF AIR OUTLET
METAL
VENTILATOR CAP
15"
DIAMETER
TOTAL AREA 177 SQ. IN.
CANVAS
CANVAS
FOUR ROPES TO RAISE & LOWER CAP
DOTTED LINES SHOW POSITION OF
CAP WHEN LOWERED
THE GARDINER SANATORY TENT
SIZE 15 FOOT
COLORADO 1902
PLATE NO. 3



A - BED - 3'-0" x 6'-3"
B - SHELF - 10" WIDE - WITH CURTAINS & HOOKS
C - TRUNK - 1'-8" x 2'-8"
D - TABLE - 2'-4" x 3'-6"
E - CHAIR - 1'-6" x 1'-6"
F - ARM-CHAIR - 1'-6" x 2'-0"
G - BUREAU - 1'-7" x 3'-2" - STANDING 8" FROM WALL ON ACCOUNT OF HEIGHT
H - DOOR - OCCUPIES SPACE AS SHOWN
J - TRUNK - 1'-7" x 2'-10"
K - WOOD-BOX - 1'-3" x 1'-9"
L - WOOD-STOVE - 1'-0" x 2'-6" - DOTTED LINE SHOWS CYLINDER COAL-STOVE
M - WASH-STAND - 1'-6" x 2'-6"
N - CAMP-STOOL - 1'-3" x 1'-3"

THE GARDINER SANATORY TENT
SIZE 15 FOOT COLORADO 1902
PLATE NO. 4

in most tents. The floor of the tent is about eight inches from the ground so there is very little fear of dampness. It is, of course, more comfortable and practical for an invalid to live in this tent during the winter, in a climatic dry belt such as Colorado, Mexico, Arizona, some parts of California, &c., but they have been used with success in Massachusetts, Oregon, New York, and probably in many other places.

The inherent idea, common to many minds, that during the cold months living in a tent must necessarily be a hardship is difficult to overcome. A tent generally brings up the picture in one's mind of cold, dust, wet, flies, glaring light, and, in general, the usual experiences one has on a camping trip. But in a sanatory tent, especially if any degree of common sense and care is used to have the tent in the shade during the summer, these discomforts are not felt, and invalids assure me that they are quite as comfortable as in a house. I know many invalids living in the average boarding-house room at health resorts who are certainly not as comfortable as they would be in the sanatory tent, either day or night. It is furthermore not a theory, but a proved fact, this sanatory tent having been in actual use for two or three years and under different conditions of climate. Not only have insipient cases done well, but those far advanced with cavities have had fever diminished and general improvement occur. In several instances these patients had been living in ordinary tents from a year to two years without benefit, and after living in a sanatory tent have, within a short time, improved in weight and strength.

The ventilating system of the sanatory tent construction can also be utilised in a building made entirely of wood. A small six-sided or circular house could be made of timbers and shingles, with a sharply pitched roof and an opening in the top to allow of outflowing air, while the floor of such a building could be so constructed as to leave an open space of one inch all around inside the walls for fresh air to flow in constantly. Such a building could also be heated by an open fireplace,

or stove, or steam; or hot water could be conveyed to it. Such a house could be comfortably furnished and have doors and windows, and, by utilising all the sanatory features of the tent, would, in addition, be much more durable and possibly be available for many invalids in damp climates during the winter months who could not be induced to live in a tent of any kind. Also, these sanatory tents, or, if preferred, sanatory tent houses, can be used as part of a general sanatorium; a main building being constructed as a heating, dining, and administration building, which could be surrounded by those tents. In this way they would be as practical as the present cottage system at far less expense, and patients living in them could be assured of a supply of outdoor air, which in purity and quantity would far excel that obtained in the ordinary sanatorium cottages.

I wish to acknowledge my indebtedness to Mr. George Southard who has very kindly made the sectional drawings of tent construction, and also took two of the photographs.

NOTE.—The actual construction of these tents can be much better understood from the drawings and figures which are here shown than by any description. The view of the tent interior represents a dome of canvas which divides the tent into two parts, but allows of a wide space at the edge of dome for air to pass upwards by the wall of tent. This economises heat and is used in very cold weather. I have allowed the Colorado Springs Tent and Awning Co. to patent my invention of the sanatory tent, and I derive no pecuniary benefit from their construction and sale.