(No Model.) 2 Sheets—Sheet 1.

# W. H. BOWMAN.

## AIR HEATING DEVICE FOR BEDS AND ROOMS.

No. 333,820. Patented Jan. 5, 1886.

Fig. 1.

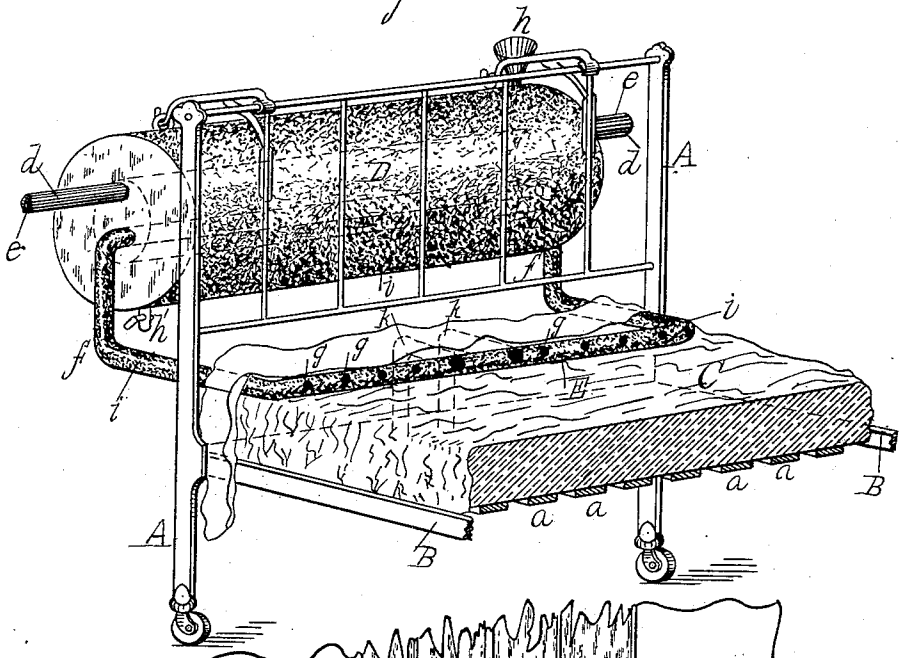
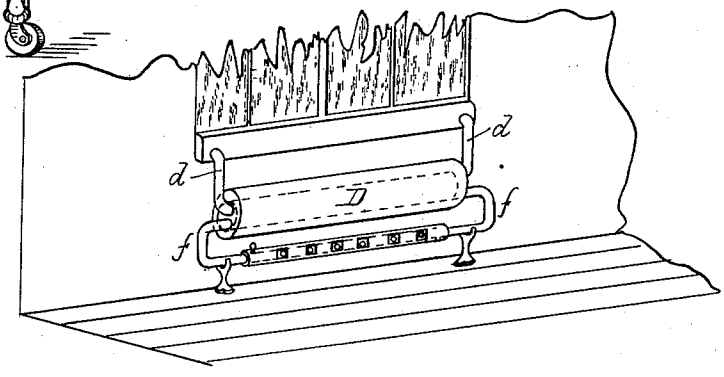



Fig. 5




Witnesses.
A. F. Hayden.
H. E. Lodge.

Inventor.
Winthrop H. Bowman.
F. Curtis. atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

(No Model.)

2 Sheets—Sheet 2.

# W. H. BOWMAN.

## AIR HEATING DEVICE FOR BEDS AND ROOMS.

No. 333,820. Patented Jan. 5, 1886.

Fig. 2.

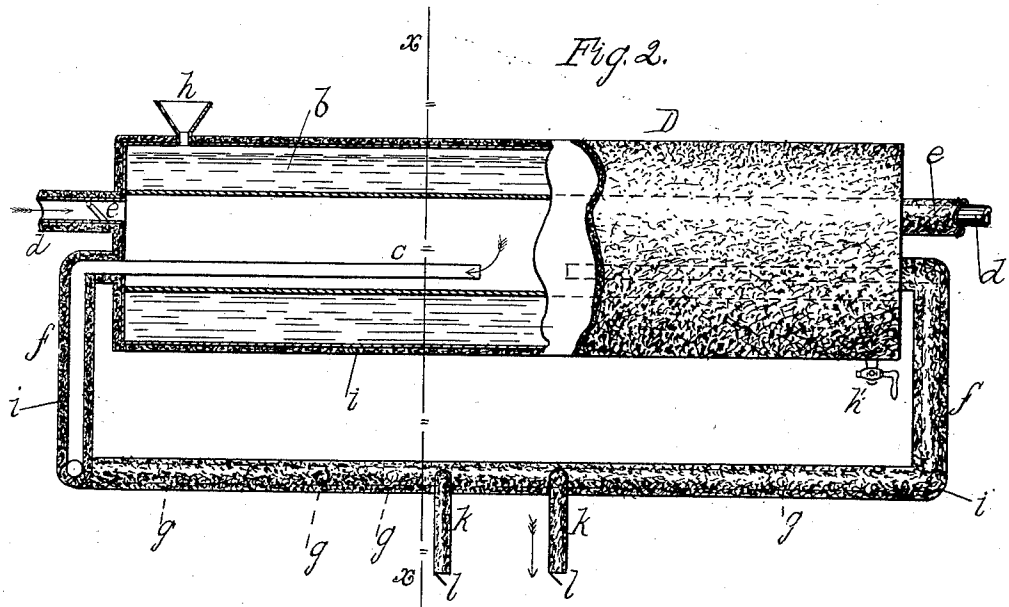



Fig. 3.

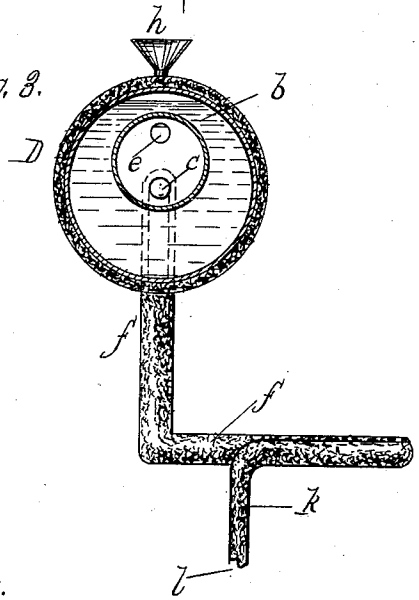
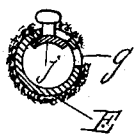



Fig. 4.




Witnesses.
A. F. Hayden.
H. E. Lodge

Inventor.
Winthrop H. Bowman.
F. Curtis, Atty.

N. PETERS. Photo-Lithographer. Washington, D. C.

# UNITED STATES PATENT OFFICE.

WINTHROP HIGHT BOWMAN, OF BOSTON, MASSACHUSETTS.

## AIR-HEATING DEVICE FOR BEDS AND ROOMS.

SPECIFICATION forming part of Letters Patent No. 333,820, dated January 5, 1886.

Application filed April 24, 1885. Serial No. 163,373. (No model.)

*To all whom it may concern:*

Be it known that I, WINTHROP HIGHT BOWMAN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Devices for Aerating Beds and Rooms; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to means by which pure warm air may be supplied to the space between the mattress and the covering-clothes which is usually occupied by a person when in bed. Ordinarily, the individual, whether sick or in good health, is closely covered by the sheets and blankets without any chance for a change of that air by which the person is surrounded when so resting between the bed-clothes. Now, the emanations from the body are well known to be considerable, and it is really a question of health that the skin of the body should be supplied with fresh pure air, as well as the lungs.

My present invention more particularly relates to a device by which pure air, heated to any desired degree, may be passed into the space occupied by the person between the bed-clothes. The action of said clothes, in connection with certain other apparatus to be more fully described, performs the office of bellows, to draw in pure warm air and expel that which has become contaminated by contact with the occupant.

It is seldom if ever that a person remains perfectly quiet or in one position the entire night, and any movement in turning or moving the limbs beneath the bed-clothes will create a slight lift of the same; hence there will be a constantly repeated inhalation of fresh air to and exhalation of impure air from the presence of the occupant.

The drawings accompanying this specification represent, in Figure 1, a perspective view of a bed provided with my ventilating apparatus containing my invention, while Fig. 2 shows a rear sectional elevation of a heating apparatus and the air-pipes connecting therewith. Fig. 3 is a cross-section of the heater on line *x x* of Fig. 2. Fig. 4 is a cross-section of the regulating-valve. Fig. 5 represents a front elevation of devices embodying my invention applied to a window.

In these drawings, A A represent the foot-posts of a bed of any description, in which the side supports are shown at B B, and the slats *a a*, &c., upon which rests the mattress. (Marked C.) One advantage in my apparatus is that neither the bed, mattress, or bed-clothes must be of any special or particular description or make, since the apparatus, as will be seen, can be readily applied to or removed from any bed at a moment's notice.

As shown in the drawings, I have suspended a cylindrical heater, D, from the frame, extending between the foot-posts A A by hooks or screw-clamps or any fastening device by which to effect a ready removal, if so desired. This heater may be made of any desired light material capable of retaining water, and is divided into two compartments, *b c*. The cylinder *b* contains the heat-maintaining fluid, preferably warm water, while the inner and inclosed one, *c*, receives the air to be heated. This air is admitted through two pipes, *d d*, which conduct air from the room or from an air-box, whence pure cool air may be obtained, and the supply thereof is limited and regulated by two clapper or check valves, *e e*. The supply-pipes *d d* extend into the chambers *c*, about centrally thereof, since it is necessary to draft the warmest air contained in it, and, besides, by such location of the orifice of said pipes the air passing out will be heated more uniformly. Furthermore, two similarly-disposed pipes, *f f*, lead from the heating-chamber and unite in a pipe, E, provided with perforations *g g*. This pipe rests at the foot of the bed upon the top of the mattress and between the upper and under sheets. In case water is used I provide a supply-inlet at *h* and a discharge-valve at *h'*, while to prevent radiation of heat, and consequent rapid cooling of the heater and the pipes leading therefrom, I have covered them with non-conducting material. (Shown at *i i*.) By this means a small amount of hot water introduced into the heater will properly heat for twelve or fourteen hours any air which may be passed through during that time.

The pipes for discharging the impure air, as shown at *k k*, are supplied with clapper or check valves *l l*, which permit warm impure air to escape, but are closed to the admission of air from the room. The valves *e e*, corresponding to the valves *l l*, are introduced within the supply-pipes *d d*, and permit entrance of the fresh warm air within the bed, but are closed and prevent any return of the warm air back into the cylinder or chamber *c*. The supply of air to the interior of the bed is to be regulated by the valve *j*, as shown in Fig. 4 as composed of a curved plate secured either upon the interior or exterior of the perforated pipe E, the perforations of the latter being closed more or less at the option of the occupant of the bed.

The operation of this apparatus is as follows: The heater is hung at the foot of the bed with the supply and discharge air-pipes disposed, in the manner shown in Fig. 1, between the lower and upper sheets. Hot water is then introduced and the apparatus is ready for use, it being understood that the supply-pipes *d d* receive their air from the room or from any source whence pure cool air can be obtained. Suppose the person to occupy the bed is an invalid, and it is required to thoroughly warm the bed previous to its occupancy. The attendant takes hold of the upper bed-clothes, the sheet, blankets, or comforters and lifts them up and down. The resultant action of the lift of said clothes is to create a suction, which creates an inward current into and within the space to be occupied by the person, at the same time opening the supply-valves *e e* for the admission of warm air, and closing the discharge-valves *l l*. On the other hand, the fall of the clothes prevents any tendency of the circulation to return to the heating-chamber *c*, closes the supply-valves *e e*, and compels the air within the bed to pass out through the discharge-valves *k k* into the room.

This device, it will be readily seen, may be applied to a window for the ventilation of a room, and answer equally well, since in this particular instance the pipes *d d* would lead from the outside of the building and connect with the heater, which may be located in any convenient part of the room, while the discharge-pipes, with their valves, may be connected with a ventilator either in the upper or lower part of the room. Thus a current of air and perfect circulation is obtained in the room, and in lieu of a cold current one very much modified in temperature, and yet pure, is always obtained, while if the door is opened or closed the circulation is at once increased by an induced current of air through the ventilator.

In the application of this apparatus to a bed it will be understood that owing to the free play of the supply and discharge valves *e e l l*, respectively, and to the expansion of air in the hot-air chamber, it will naturally follow that there will be a slight current induced intermittently through the bed irrespective of any movement of the bed-clothes.

The advantages of this device to any bed, whether occupied by a sick person or one in good health are equally obvious, and it is hardly necessary to mention them; but it is especially meritorious from the fact that without any danger of fire the bed can be heated prior to occupancy, and thus the room is maintained cool while the bed-clothes are warm.

I claim—

1. A pipe for discharging into the space between the mattress and bed-clothing, in combination with a heater which is connected to said pipe and an outlet extending from said pipe, said outlet and the supply-pipe of the heater being provided with check-valves located, respectively, in said outlet and supply pipe, to allow the action of the bed-clothes in creating a current of warm fresh air, substantially as set forth.

2. A transverse warm-air pipe, E, arranged in the space between the mattress and the bed-clothes and provided with holes *g*, in combination with a heater communicating with said pipe and an outlet pipe or pipes extending from it to the space below the bed, substantially as set forth.

3. The combination, with the heater, as herein described, and its supply-pipes *d d*, with their valves, of the connecting-pipes *f f* and perforated pipe E, by which the air-current is permitted to pass into the bed, substantially as stated.

In testimony whereof I affix my signature in presence of two witnesses.

WINTHROP HIGHT BOWMAN.

Witnesses:
H. E. LODGE,
A. F. HAYDEN.