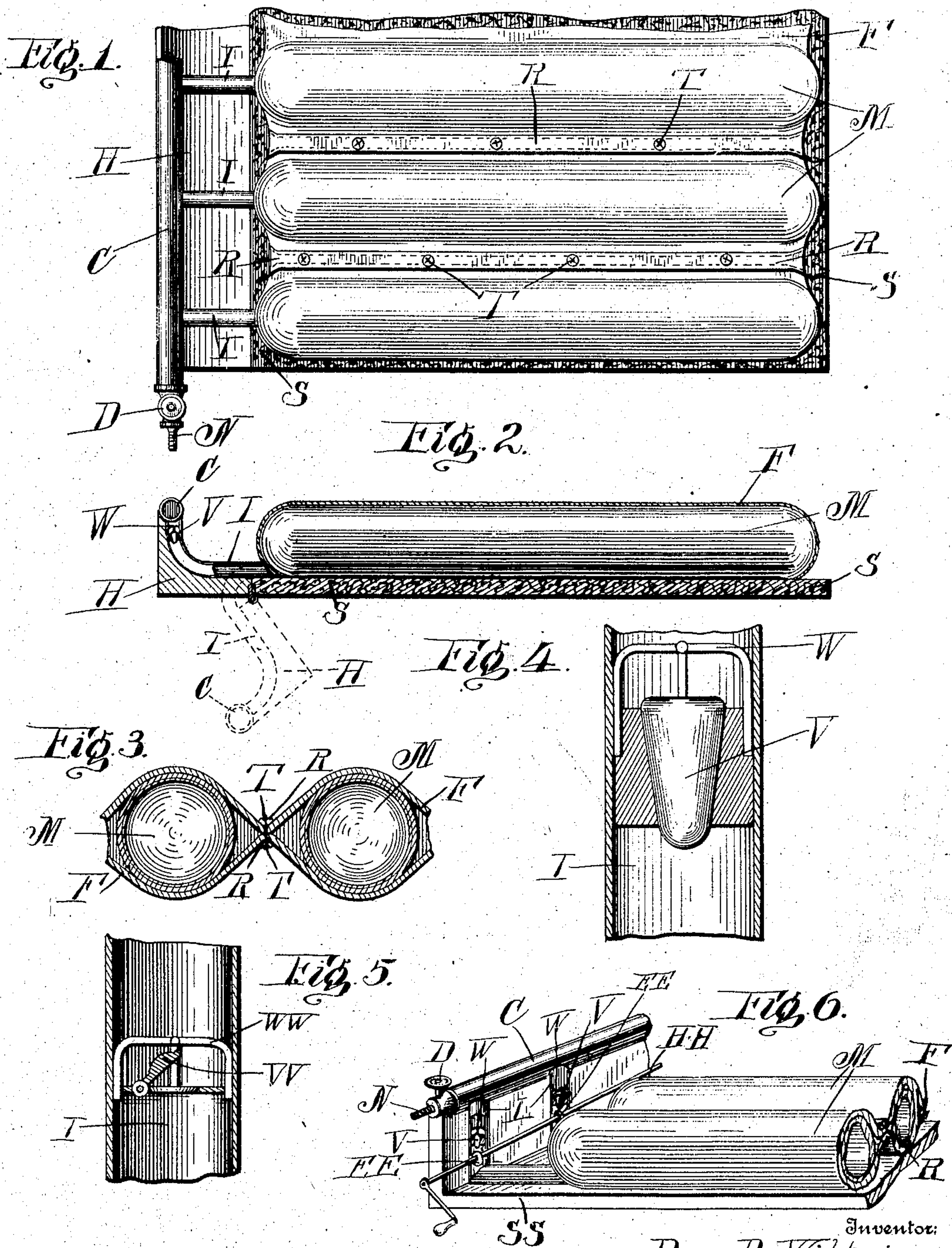


No. 786,930.

PATENTED APR. 11, 1905.

R. B. WILTSIE.  
PNEUMATIC MATTRESS.  
APPLICATION FILED NOV. 11, 1903.



Witnesses

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# UNITED STATES PATENT OFFICE.

ROY B. WILTSIE, OF TOLEDO, OHIO.

## PNEUMATIC MATTRESS.

SPECIFICATION forming part of Letters Patent No. 786,930, dated April 11, 1905.

Application filed November 11, 1903. Serial No. 180,748.

*To all whom it may concern:*

Be it known that I, ROY B. WILTSIE, a citizen of the United States, and a resident of Toledo, Lucas county, State of Ohio, have invented certain new and useful Improvements in Pneumatic Mattresses; and my preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to beds, and more especially to pneumatic mattresses used in connection therewith; and the object of the same is to improve the construction of the mattress, more particularly its manner of inflation and deflation.

To this end the invention consists, broadly, in means for individualizing the sections or members of a pneumatic mattress. One manner of carrying out this broad idea is described herein, and illustrated in the drawings, wherein—

Figure 1 is a plan view of a portion of this mattress. Fig. 2 is a transverse section. Fig. 3 is a cross-section through two of the members. Fig. 4 is an enlarged detail of one of the individual valves of the preferred type. Fig. 5 is a similar view of a modified form of valve. Fig. 6 is a perspective detail, partly broken away, showing a modification including means for positively opening the individual valves yet allowing them to close automatically.

By preference this bed is made of a number of tubes or members M, which may have inner and outer tubes and which are inclosed between sheets of canvas or other fabric F. The members are slightly spaced from each other, and between them extend reinforcing-strips R, which may be sewed together or tufted, as at T. The specific construction of the mattress itself is immaterial, excepting that it should be in sections or members extending transversely of the bed. The whole is mounted on a support S, which may be of felt, and along one edge of the bed this support has a hinged section H of about the shape shown. When the mattress is drawn laterally off the bed for a short distance, this section will drop down, as indicated in dotted

lines, the purpose being explained below. Longitudinally of the hinged section and at its upper end extends the main or common tube or chamber C, having at one end an inflating and deflating valve D of any suitable type operated by hand. Beyond this valve is a nipple N, to which the ordinary pump can be attached. Each member M has its individual tube or pipe I, which leads, preferably, from one end of the member outward and curves upward within the hinged section, as seen in Fig. 2, uniting at its upper end with the common chamber C. Within the upturned portion of each individual tube is a valve V, mounted within a wire cage W, and this valve is preferably conical in shape with its larger end upward.

In use the mattress is drawn partially off the bed, so that the section H hangs down, at which time all the valves will drop against their cages and will open automatically. The main valve D is then opened and the entire bed inflated by pumping in air through the nipple N. The main valve D is then closed, the hinged section raised, and the mattress pushed into position, and it will be clear that all the valves V will drop to their closed position. If now the occupant of the bed should suddenly exert more pressure on one member than on the others, it will be clear that the air within that member will not be driven out into the other members, as would be the case if there were no individual valves. The reason for this is because the smaller area of the valve is toward that side from which the extreme pressure comes, and yet if the pressure should be excessive the valve will open and allow the escape of air without bursting the member. The point at which the valve will open under excessive pressure will depend upon two causes—first, upon the pressure originally pumped into the entire mattress, and, second, upon the relative areas of the two ends of the individual valve.

In Fig. 5 is shown a modified form of valve V of the flap type, here mounted within a cage W, simply as showing one means for causing it to fall closed without doubt when the hinged section is raised. It is possible to use this type of valve in this construction; but



it will be obvious that when a valve of this or equivalent type is employed any pressure on an individual member which is greater than the compression within the common chamber or tube will expel some air from such member into the tube, where it will be trapped and cannot return. However, one such action will raise the pressure in the common tube and make the repetition of this action in that member or in others less likely to follow. With the use of any type of valve which opens upward or outward it will be clear that air expelled from one member cannot get into another, and hence the use of automatically-closing valves may be said to individualize the members.

In Fig. 6 is shown a modification wherein the hinged section is omitted and the support S S extends entirely beneath the bed. Automatically-closing valves V are here used to individualize the members; but positive means is employed for opening these valves when it is desired to inflate. As illustrated this means consists of a rod H H extending through all the individual pipes and carrying eccentrics E E beneath the valves V. Although merely for purpose of illustration, it will be clear that when this rod is turned the eccentrics raise the valves off their seats. This view shows one means for positively opening the valves. When positively opened, the pressure in the main chamber and all the members will immediately equalize itself. If the hinged section is employed or any other construction which contemplates the automatic opening of the valves, if they stick in their seats or are held closed by a greater pressure outside than inside, it will only be necessary to permit the escape through the main valve D of some of the pressure in the chamber. When the latter is lowered, the pressure inside the valves will cause them to open, whereupon the pressure in the members will equalize itself and afterward the bed can be pumped up again as originally.

What is claimed as new is—

1. In a pneumatic mattress, an air-chamber, and valves for inflating and deflating it; combined with a series of separate members, individual connections between them and said chamber, and means for automatically individualizing the members, whereby partial deflation of any member is permitted without increasing the inflation of the other members.

2. In a pneumatic mattress, an air-chamber,

and means for inflating and deflating it; combined with a series of separate members, individual connections between them and said chamber, valves within said connections closing automatically toward their respective members, and mechanical means for opening said valves simultaneously at will.

3. In a pneumatic mattress, an air-chamber, and means for inflating and deflating it; combined with a series of separate members, individual connections between them and said chamber, valves within said connections closing automatically toward their respective members, said valves being conical with their ends of larger area disposed toward the chamber and means for opening said valves at will.

4. In a pneumatic mattress, a support having a hinged section, a common chamber supported upon said section, and means for inflating and deflating the chamber; combined with a series of members mounted on the support, individual tubes extending from the members and turned upward within said section and uniting with the chamber, and valves within said tubes adapted to open automatically when said hinged section is lowered.

5. In a pneumatic mattress, a support having a hinged section, a common chamber supported upon said section, and means for inflating and deflating the chamber; combined with a series of members mounted on the support, individual tubes extending from the members and turned upward within said section and uniting with the chamber, and valves within said tubes adapted to open automatically when said hinged section is lowered, said valves being conical with their larger ends disposed toward the chamber.

6. In a pneumatic mattress, an air-chamber, and a manually-operated valve for opening or closing said chamber; combined with a series of separate members, individual connections between them and said chamber, valves within said connections adapted to close toward their respective members, and means for setting these valves so that they shall either close automatically or stand open.

In testimony whereof I have hereunto subscribed my signature this the 7th day of November, A. D. 1903.

ROY B. WILTSIE.

Witnesses:

ALLEN DE VILBISS, Jr.,  
J. F. W. DRAGER.