

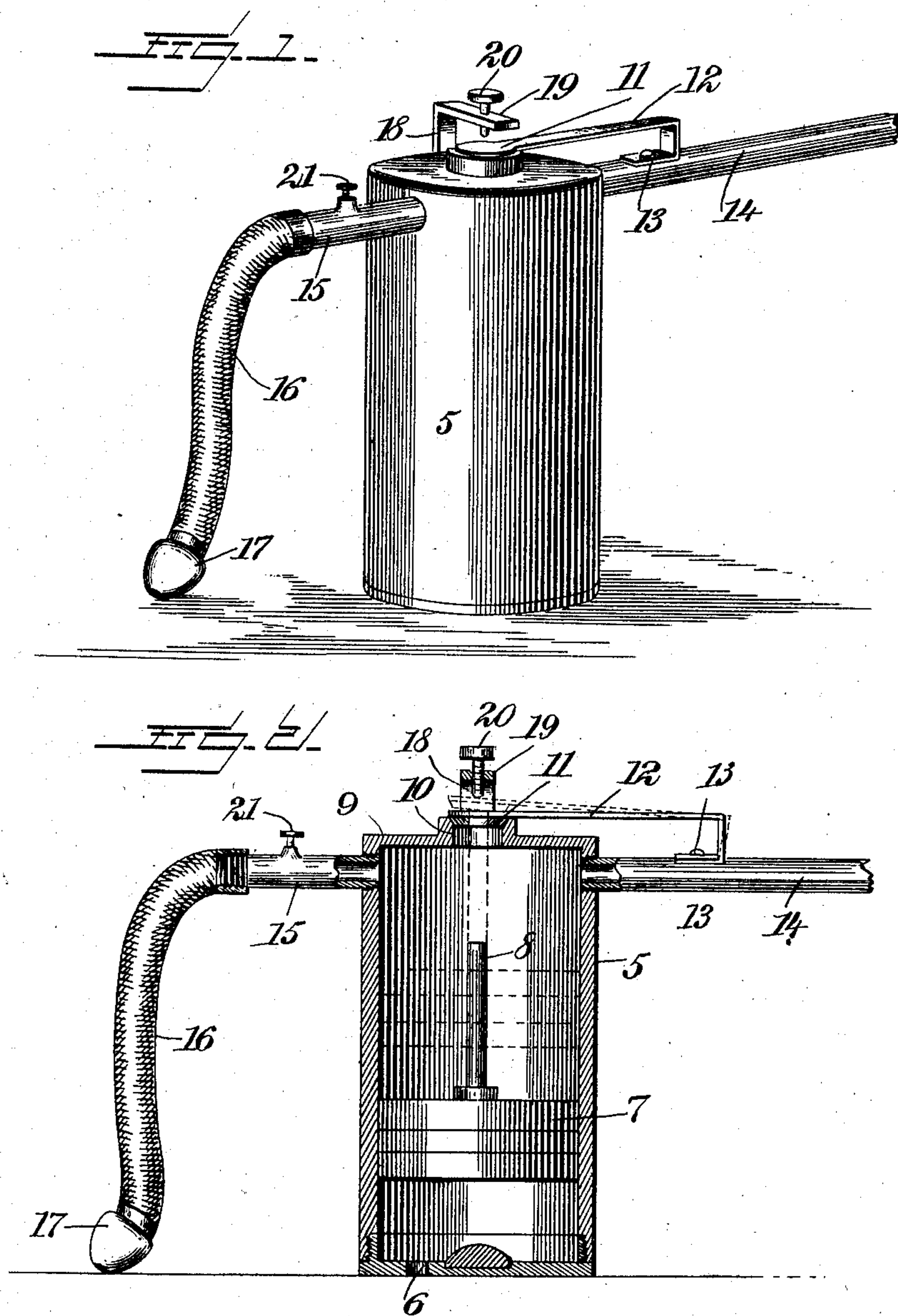
No. 757,177.

PATENTED APR. 12, 1904.

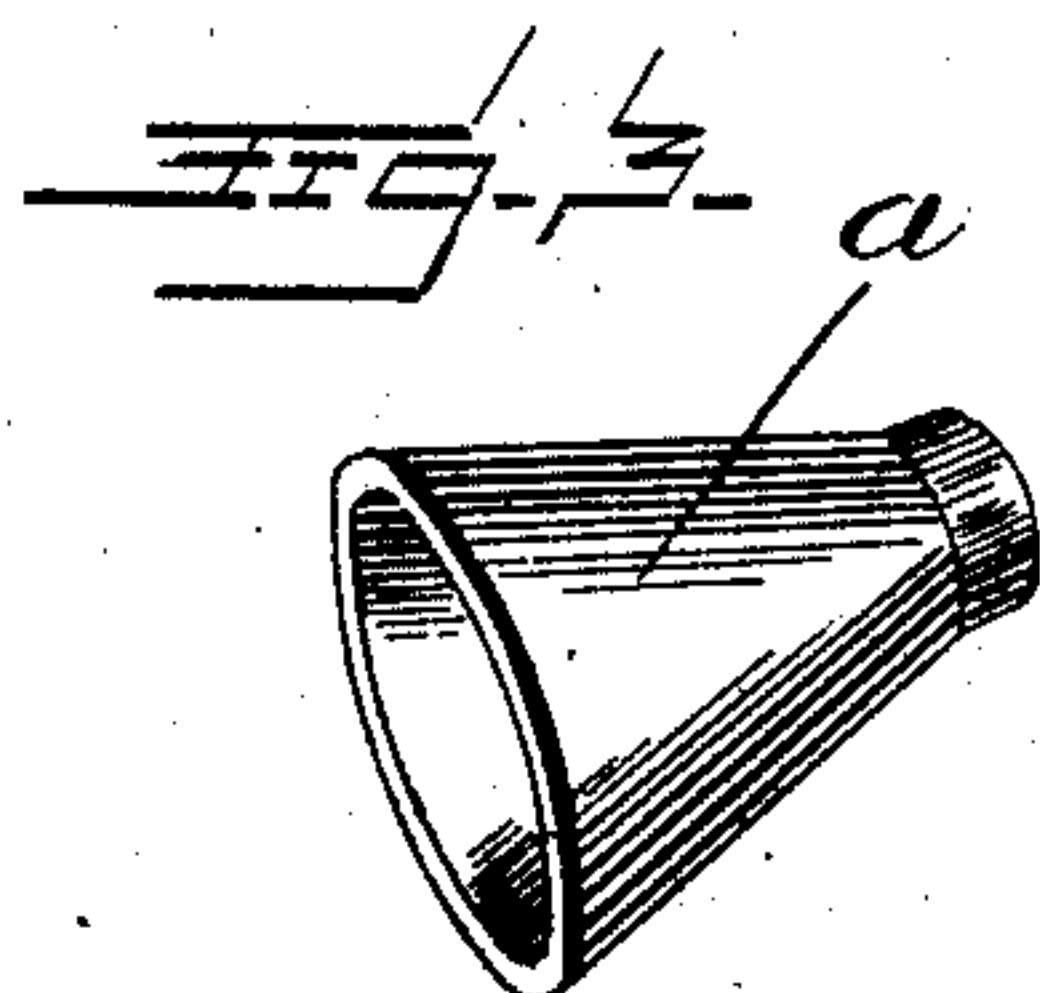
F. H. CRABTREE.  
PNEUMATIC MASSAGE APPARATUS.

APPLICATION FILED NOV. 18, 1903.

NO MODEL.



WITNESSES:  
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# UNITED STATES PATENT OFFICE.

FREDERICK HERBERT CRABTREE, OF ANACONDA, MONTANA.

## PNEUMATIC MASSAGE APPARATUS.

SPECIFICATION forming part of Letters Patent No. 757,177, dated April 12, 1904.

Application filed November 18, 1903. Serial No. 181,611. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK HERBERT CRABTREE, a citizen of the United States, and a resident of Anaconda, in the county of Deer-lodge and State of Montana, have invented a new and Improved Pneumatic Massage Apparatus, of which the following is a full, clear, and exact description.

This invention relates to improvements in a pneumatic massage apparatus, and has particular application to a novel apparatus designed for massaging or vibrating the tympanum or drum of the ear. In this instance I have especially in view the provision of a massage apparatus which may be used with convenience and safety and which through the peculiar correlation of its parts will when in operation cause the tympanum of the ear and the small bones of the inner ear to vibrate or move, this movement being produced by the apparatus alternately creating a pressure and a vacuum.

A further object of my invention is to provide an improved form of valve designed to be operated by the movement of the piston of the apparatus, so that alternate vacuum and pressure action will take place.

Finally, I have in view as an object the provision of an apparatus which will embody the essential and desired features of simplicity, durability, positiveness, and ease of operation.

With these objects and others of a similar nature in view my invention consists in the construction, combination, and arrangement of parts, as is described in this specification, illustrated in the accompanying drawings, and set forth in the annexed claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of an apparatus embodying my invention. Fig. 2 is in the main a vertical sectional view, the ducts or tubes of the apparatus being shown partly in elevation; and Fig. 3 is a perspective view of a modified form of funnel which may be used in connection with my apparatus.

Referring now to the accompanying drawings, 5 designates the cylinder or chamber of

the device, said cylinder having an opening 6 formed in the bottom portion thereof for the admission of air. Movable within the cylinder is a piston, the head thereof, which is indicated at 7, having secured thereto a short vertical rod 8, said piston being designed to move up and down in the cylinder, as is shown in dotted lines in Fig. 2. The top 9 of said cylinder is provided with a central opening 10, this opening being in turn closed by a valve 11, the stem 12 of which is in the nature of a relatively long flat brass spring secured at 13 to a pipe or tube 14. This pipe 14 is designed to be connected to a vacuum-pump of any ordinary or well-known character for the purpose of causing the movement of the piston in the cylinder, and the spring 12 is of such strength or tension that it normally retains the valve 11 in a position to close the opening 10 of the cylinder. Connected also to the top of the cylinder and preferably directly opposite the vacuum-pump tube 14 is a small tubular section 15, designed to have threaded or otherwise secured to the end thereof a flexible tubular section 16, the free end of said section having a nozzle 17 secured thereto. In order to regulate the distance that the valve may be moved from its seat or to prevent the movement of the valve from its seat, I have provided a bracket 18, which is secured to the side of the cylinder, the horizontal member 19 of said bracket having extending therethrough a set-screw 20, which may be turned to bear upon the valve and regulate the distance it may be moved from its seat.

From the above description, taken in connection with the accompanying drawings, the construction and manner of employing my improved device will be readily apparent. The nozzle of the flexible tube or hose is placed in the ear and the vacuum-pump started, the piston in the cylinder is forced upward by the atmospheric pressure on its under side, and the drum or tympanum of the ear is drawn outward, the rod which is carried by the piston-head in the upward movement of the piston passing through the opening in the cylinder-top and contacting with the valve 11, raising the same, and thus admitting the atmosphere and breaking the vacuum. When



this occurs, the drum or tympanum of the ear is pushed or forced back by atmospheric pressure and the piston drops downward or back toward the bottom of the cylinder, thereby  
 5 allowing the valve to close, when a vacuum is again formed and the operation is repeated. The alternate vacuum and atmospheric-pressure operations are very rapid, and the ear-drum responds to each vibration. As is well  
 10 known, deafness is often caused by a thickening of the ear-drum and also by the small bones of the inner ear becoming clogged or stiffened, so they will not respond to the sound-waves. With the use of my improved  
 15 apparatus the exercise given to the tympanum and the small ear-bones gradually cures the disease. The pressure of air passing through the tube 15 may be regulated by the valve shown at 21.

20 In addition to employing my device as a massage apparatus for the ear, it may be used for massaging other parts of the body, and in this case the small nozzle 17 is removed from the flexible tube and a funnel-shaped  
 25 nozzle *a* (shown in Fig. 3) may be substituted.

While I have herein shown one particular embodiment of my invention, it is to be understood that there may be modifications and variations with regard to certain details of construction without departing from the spirit of  
 30 my invention or sacrificing any of the advantages thereof.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

35 1. The combination of a cylinder having an opening in the bottom thereof, a vacuum-tube leading into said cylinder, an outlet-tube leading from the cylinder, a piston movable in the cylinder, and a valve operated by said piston.

40 2. The combination of a cylinder having an opening formed therein for the admission of

air, a vacuum-tube connected with said cylinder, a flexible tube also connected with said cylinder, a spring-tensioned valve designed to normally close the opening in the cylinder, a  
 4 rod carried by said piston for opening the valve at predetermined times to admit atmosphere into the cylinder, and means comprising a bracket and an adjustable screw carried  
 5 thereby, for regulating the movement of the valve away from its seat, substantially as set forth.

3. In a pneumatic massage apparatus, the combination of a hollow member provided with a valve, a piston disposed within said hollow member and controllable by atmospheric  
 5 pressure but otherwise free, means for varying the air-pressure upon one side of said piston without affecting the air-pressure upon the other side thereof, a valve to be opened  
 6 by movements of said piston, and a pneumatic connection between said hollow member and the organ to be treated.

4. In a pneumatic massage apparatus, the combination of a hollow member provided with a valve, a piston loosely disposed within  
 6 said hollow member and provided with a stem for opening said valve, means for applying atmospheric pressure to one side of said piston for the purpose of moving the same relatively  
 7 to said valve, a pneumatic member for connecting said hollow member with the organ to be treated, and an adjustment screw for partially closing said pneumatic member.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK HERBERT CRABTREE.

Witnesses:

GRIFFITH MORRIS,  
 ABRAHAM DAVIES.