June 12, 1956 F. J. WALLACE 2,749,913

SURGICAL DRAIN

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Fig. 1

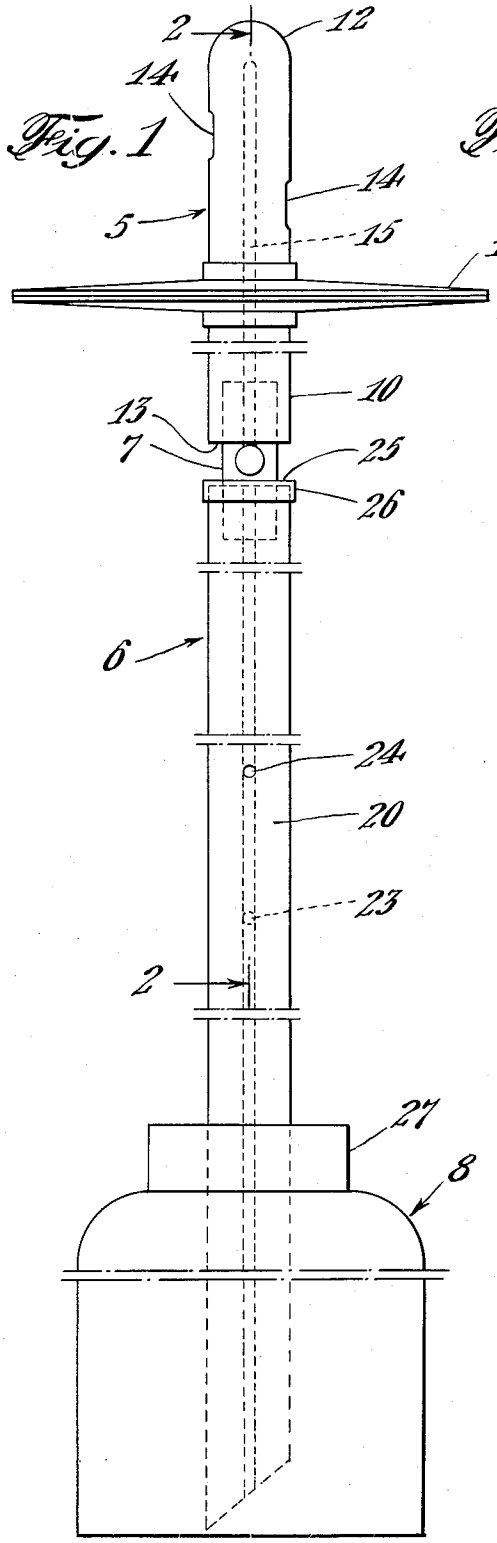
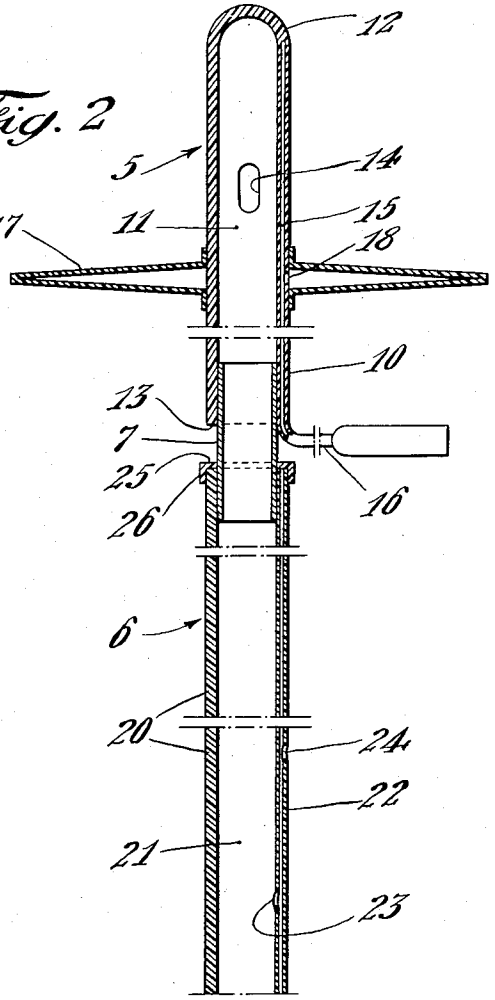


Fig. 2



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2,749,913

SURGICAL DRAIN

Frederick J. Wallace, New York, N. Y., assignor to American Cystoscope Makers, Inc., New York, N. Y., a corporation of New York

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6 Claims. (Cl. 128—295)

This invention relates to surgical drainage apparatus and pertains, in one of its more specific aspects, to an improved surgical drain for use in evacuating urine from the bladder of a patient while the patient is being treated for a urological disorder or is recovering from an operative procedure.

Catheterization, for withdrawing urine from the bladder, is generally required in treating patients who are suffering from various urological disorders or who are recovering from operative procedures involving such disorders. To this end, a catheter of the inflatable bag, retention type is usually introduced into a patient's bladder by way of the urethra. When the catheter has been advanced to the desired position in the bladder, its bag is inflated, thereby ensuring retention of the catheter in such position and preventing its accidental withdrawal.

In cases where a patient remains in his bed, a flexible drain tube of suitable length is connected at one end to the discharge end of the catheter and at its other end to a bottle or other receptacle located under the patient's bed. Urine collected in the bladder is admitted into the catheter by way of the inlet openings or eyes of the catheter and flows through the catheter and the tube into the receptacle. In the course of excretion of urine through the catheter, a column of urine is frequently built up in the drain tube. This column creates a partial vacuum thereabove, which tends to draw the mucosa of the bladder into the inlet openings or eyes of the catheter thereby causing irritation to the bladder and patient discomfort. Such vacuum may be as much as 75 cm. to 100 cm. water pressure.

The present invention prevents formation of the vacuum-creating column of urine in the drain tube in a manner that will be discussed in detail further along herein. Consequently, irritation of the bladder and discomfort to the patient, caused by such vacuum, are eliminated.

It is a principal object of the invention to provide a surgical drain having improved features of construction.

Another object of the invention is to provide a drainage system for evacuating urine from a patient's bladder, such a system comprising a retention type catheter, a drain tube and a liquid-receiving receptacle that are detachably connected in series, the drain tube being so formed as to prevent the formation of a vacuum-creating column of urine in the system during use thereof.

A further object of the invention is to provide a surgical drainage system of the character indicated that is adapted to perform its intended functions in an entirely satisfactory manner and without undue irritation of the bladder or discomfort to the patient.

With the view of attaining the foregoing objects, a drainage system constructed in accordance with the invention preferably comprises an inflatable bag, retention type catheter that is adapted to be introduced into a bladder by way of the urethra, an elongated flexible tubular member having a central longitudinal through passage, a relatively short nipple or conduit, removably connecting one end of the tubular member to the catheter and establishing communication between the discharge end of the

catheter and the central passage of the tubular member, and a liquid-receiving receptacle connected to the other end of the tubular member and having its interior in communication with the central passage. Urine is evacuated by the bladder and transmitted to the receptacle by way of the catheter, the nipple and the central passage in the tubular member, in the order named. The tubular member is provided with a second longitudinal passage which is preferably extruded in its wall. Also formed in the wall of the tubular member is a pair of spaced openings, one of which establishes communication between the central passage and the second passage, while the other places the second passage in communication with the atmosphere. The second passage and the openings communicating therewith are so formed and arranged as to vent the central passage to the atmosphere, thereby preventing formation of a vacuum-creating column of urine in the central passage. The second passage is small in diameter to prevent leakage of urine through the wall of tubular member.

Both the catheter and the tubular member are flexible and may be made of any appropriate material, including rubber or a suitable thermoplastic resinous material, such as polyethylene or a copolymer of vinyl chloride and vinyl acetate. It is recommended that the catheter and the tubular member be made of one of the herein identified thermoplastic materials since these materials possess properties and characteristics which render them particularly suitable for use in surgical drainage items.

The enumerated objects, as well as other objects, together with the advantages of the invention will be readily understood by persons skilled in the art upon reference to the following detailed description taken in conjunction with the annexed drawing, which respectively describe and illustrate a recommended embodiment of the invention.

In the drawing:

Fig. 1 is a view in elevation of a surgical drainage system constructed in accordance with the invention, with parts broken away; and,

Fig. 2 is a sectional view taken along line 2—2 of Fig. 1.

Referring now to the drawing wherein like reference numerals identify corresponding parts in the several views, I have shown an assembly of devices consisting of an inflatable retention catheter 5, a drainage tube 6, a nipple 7, detachably connecting the discharge end of the catheter to one end of the drainage tube, and a bottle or other suitable receptacle 8 in which the other end of the drainage tube is disposed.

Catheter 5 comprises a flexible tubular element 10 having a central longitudinal passage 11. Element 10 is closed at its forward end 12 and open at its rearward end 13 and has one or more inlet openings or eyelets 14 which establish communication between the exterior of the catheter and passage 11. Tubular element 10 also has a blind longitudinal passage 15 formed in its wall. Passage 15 communicates with a conduit 16. An annular inflatable bag 17 is hermetically sealed to the tubular element rearward of inlet openings 14 and communicates with passage 15 by way of a port 18. The bag is adapted to be inflated by air admitted into its interior by way of conduit 16, passage 15 and port 18, in the order named. The catheter may be the same as, or similar to, the one illustrated and described in my Patent 2,667,875, granted February 2, 1954, and entitled "Inflatable Retention Catheter," to which reference may be had for further details of construction and mode of use.

Drainage tube 6 comprises an elongated flexible tubular member 20 which is preferably extruded to obtain a central longitudinal through passage 21 and a secondary longitudinal through passage 22 that is independent of

passage 21. Passage 21 is preferably the same in diameter as catheter passage 11. Passage 22, on the other hand, is of small size as compared to passage 21. Tubular member 20 is also provided with a pair of spaced openings 23 and 24, opening 23 establishing communication between passage 21 and passage 22 while opening 24 places passage 22 in communication with the atmosphere.

Nipple 7 preferably consists of a short rigid conduit that is adapted to be readily sterilized. The nipple serves as a means for detachably connecting the drainage tube to the catheter, and etsablishes communication between catheter passage 11 and drainage tube passage 21.

A ring 25 having a depending annular flange 26 encircles the nipple and bears against the upper end of tubular member 20 thereby sealing off the corresponding end of passage 22. This ring may be a separate element, as shown, or may be formed with the nipple.

Thus it will be seen that the construction herein shown and described is well adapted to accomplish the objects of the present invention. It will be understood, however, that the invention may be embodied otherwise than here shown, and that in the form illustrated certain obvious changes in construction may be made. Therefore, I do not wish to be limited precisely to the construction herein shown except as may be required by the appended claims considered with reference to the prior art.

I claim:

1. In a surgical drain, a flexible tubular member having a first passage extending longitudinally therethrough, one end of the tubular member being adapted to be connected to a catheter with said first passage in communication with the discharge end of the catheter, the other end of the tubular member being adapted to be disposed in a liquid-receiving receptacle with said first passage communicating with the interior of the receptacle, said tubular member having a second longitudinal passage that is independent of said first passage, a first opening establishing communication between said first passage and said second passage, and a second opening placing said second passage in communication with the atmosphere.

2. A surgical drain according to claim 1 wherein said openings are spaced apart and are spaced from the ends of the tubular member.

3. A surgical drain according to claim 1 wherein said openings are spaced apart and are spaced from the ends of the tubular member, said second opening being disposed between said one end of the tubular member and said first opening.

4. In a surgical drainage system, a catheter having a discharge passage, an elongated flexible tubular member having a first passage extending longitudinally therethrough, means removably connecting one end of the tubular member to the catheter and establishing communication between said discharge passage and said first passage, a liquid-receiving receptacle, the other end of the tubular member being disposed in the receptacle with said first passage communicating with the interior of the receptacle, said tubular member having a second longitudinal passage that is independent of said first passage, a first opening establishing communication between said first passage and said second passage, and a second opening placing said second passage in communication with the atmosphere, said openings being spaced apart longitudinally and being spaced from said means and from the receptacle.

5. A surgical drainage system according to claim 4 wherein said first opening is disposed between said second opening and the receptacle.

6. In a surgical drainage system, a catheter having a discharge passage and including an inflatable bag for effecting retention of the catheter in a body cavity, an elongated flexible tubular member having a first passage extending longitudinally therethrough, a conduit removably connecting one end of the tubular member to the catheter and establishing communication between said discharge passage and said first passage, a liquid-receiving receptacle, the other end of the tubular member being disposed in the receptacle with said first passage communicating with the interior of the receptacle, said tubular member having a second passage extending longitudinally therethrough, said second passage being independent of said first passage, closure means at said one end of the tubular member sealing the corresponding end of the second passage, said tubular member also having a first opening establishing communication between said first passage and said second passage and a second opening placing said second passage in communication with the atmosphere, said openings being spaced apart longitudinally and being spaced from said means and from the receptacle, said first opening being disposed between said second opening and the receptacle.

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