

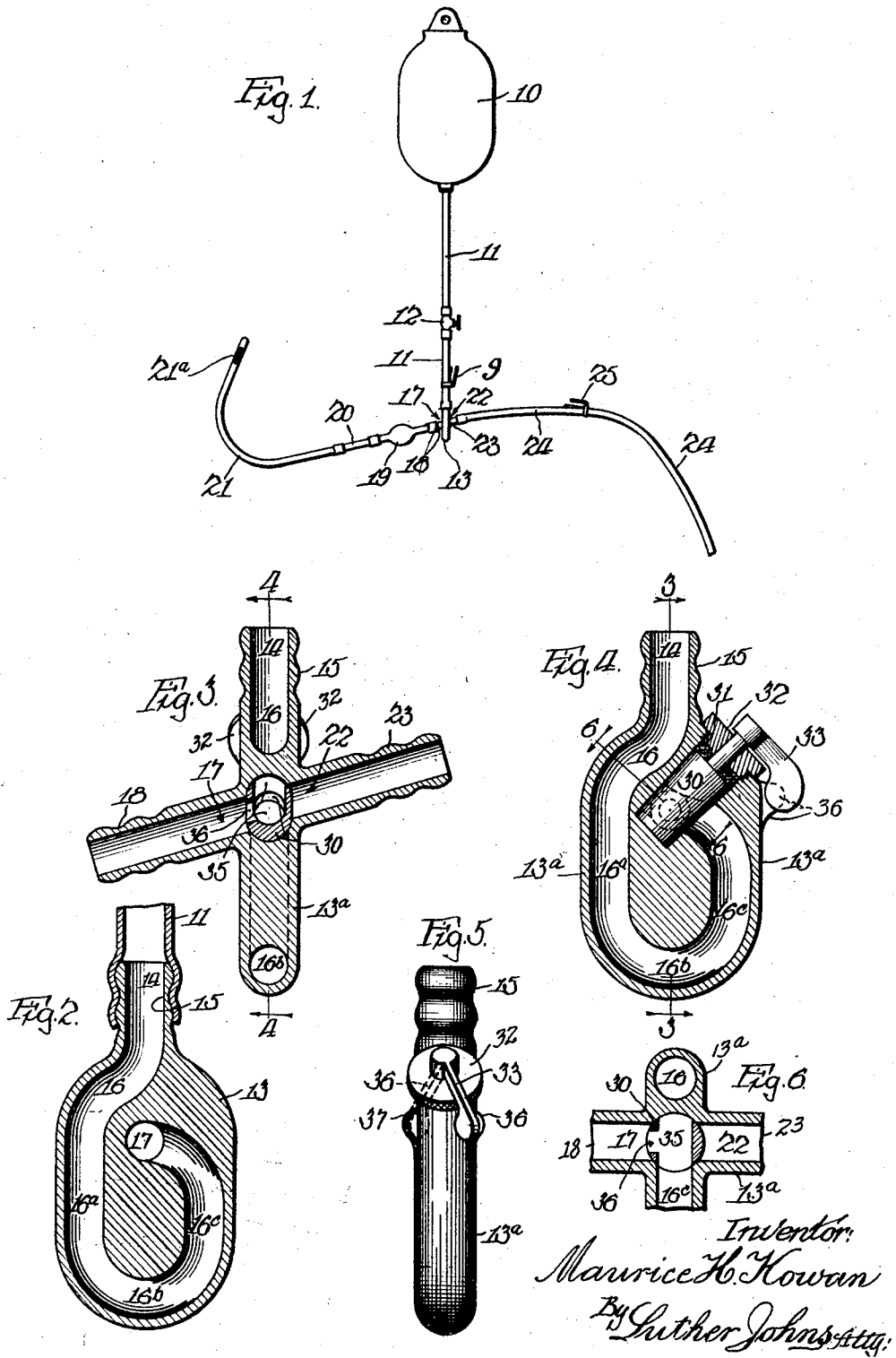
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IRRIGATOR

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IRRIGATOR

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The improvements relate to irrigators for body cavities, especially the stomach and intestines.

The therapeutic value of a proper irrigation of the intestines, for example, is exceedingly great in many pathological conditions. Instruments and agencies have heretofore been provided whereby such irrigations may be accomplished in a highly satisfactory manner by skilled operatives professionally engaged in such cleansing. The chief object of the present invention is to provide an apparatus or device whereby the same character and quality of results may be obtained by the individual in his own home, and without an operator or attendant.

Such cleansing of the intestines is far more than that accomplished by the simple enema. The present improvements are designed to effectuate a regulable inflow of liquid, say water or water charged with a medicament, and then an outflow or discharge, the applicator tube remaining in place within the body cavity, however, and the alternate operations of inflow and outflow being often repeated, the catheter or tubular flexible applicator being gradually inserted more and more deeply within the body cavity. This method of treatment is not new.

Other general advantages and certain specific objects in connection with details or parts of the construction or organization will appear hereinafter.

In the drawings Figure 1 is an elevation of my improved device complete, in a simple form; Fig. 2 is an enlarged vertical section through what I shall call the connection member of Fig. 1; Fig. 3 is an enlarged vertical section, as on the line 3—3 of Fig. 4, of a form of the connection member modified by the addition of a valve; Fig. 4 is a vertical section at right angles to the view of Fig. 3, as on the line 4—4 thereof; Fig. 5 is an edge view of the device of Figs. 3 and 4; and Fig. 6 is a sectional view as on the line 6—6 of Fig. 4.

Referring to Fig. 1, the device illustrated shows a source of liquid supply 10 in the form of a rubber bag which may be supported as by hanging it upon a nail in an

elevated position. The rubber tube 11 extends downward from the bag 10 and carries means 12 for regulating the amount of liquid being used. The element 12 may be a valve proper or a constricting device adapted to compress the tube and limit its cross area at that place. This feature for regulating the flow is highly important since certain users are able to work with only a limited amount of liquid, and in any event it is at times desirable to reduce the flow temporarily to enable the liquid to penetrate more gradually among the folds, bends, etc., in the tissues as well as into the material which it is desired to loosen and remove.

The tube 11 then extends beyond the regulator 12 to the connection member 13 which is shown on a larger scale in Fig. 2. Means for controlling the flow through tube 12, as to open and close the tube, are shown in Fig. 1 as an ordinary spring clip 9 of the kind universally found on the ordinary enema outfit.

Turning to Fig. 2, the connection member 13 has an intake port 14 defined by a nipple 15 integral with the body 13, the nipple being frictionally inserted into the lower end of the tube 11. From the port 14 a passageway 16 extends first downward at the part 16a, thence across at part 16b and thence upward at the part 16c to a discharge port 17 the side and place of which is indicated by the arrow 17 in Fig. 1.

The body 13 has a nipple 18 surrounding the port 17, and on the nipple 18 is one end of the flexible hollow bulb 19. A short transparent tube 20, as glass, enters the other end of the bulb 19, while the catheter or applicator 21 is stretched upon the outer end of the glass tube 20. The applicator has an opening 21a for discharge and intake.

Since the connection members in all of the figures of the drawings are the same except for the valve shown in Figs. 3 to 6, the corresponding parts may be numbered the same, and Fig. 3 shows all of the parts of Fig. 2 and may be referred to in that connection, considering, however, the centrally-arranged valve of Fig. 3 removed.

Reverting to the device of Fig. 2, there is

a port 22 (Fig. 3) directly opposite the port 17 and defined by the nipple 23. The ports or passageways 17 and 22 of the device of Fig. 2 are in a straight line and directly in communication with each other, and the passageway 16c of Fig. 2 opens directly into both of the ports or passageways 17 and 22.

Reverting to Fig. 1 there is a discharge tube 24 on the nipple 23 and carries a clip 25 for opening and closing the discharge conduit.

With this understanding it will be clear from Fig. 1 that should the clip 25 be operated to close the tube 24 and the clip 9 on the tube 11 be released, liquid will flow downward through the passageway 16 to the port 17 and thence through the bulb 19 and glass tube 20 to and through the applicator 21.

I have found that when a quantity of water has thus been injected notably advantageous results are had if the water in the body cavity be agitated. To this end the operator squeezes upon and releases the bulb 19 causing a back-and-forth surge in the applicator and consequently a disturbance of the water in the body cavity. I believe this feature of agitation is new, and it is peculiarly valuable and important in a device for individual use. A very valuable feature of it is that it serves also to maintain the catheter and its opening as 21 free of clogging.

When it is desired to discharge water, solid matter and the gases therewith the clip 14 is operated to close the tube 11 and the clip 25 is operated to open the discharge pipe. Thereupon the flow passes from port 17, (Fig. 3) to port 22 and thence through the discharge pipe.

In this connection note that the liquid trap consisting of the passageways 16a, 16b and 16c is between the intake port 14 (Fig. 2) and the discharge ports 17 and 22. Substances coming from the body cavity may not, therefore, pass upward into the passageway leading to the source of liquid supply to contaminate it. Especially important, however, this provision makes against the passage of gases into the pipe 11. Were the liquid supply led directly to the passageways 17 and 22 as by a simple inverted T pipe connection, such gases would replace liquid in the supply conduit at least to the extent between the elevation of the passageway 17, 22 and that the clip 14. Then on the ensuing inflow through the catheter that gas would be carried back into the body cavity. In some cases this would be very painful, and in any event it would militate against the results. This feature of preventing the re intake of gases is believed to be new.

Referring now to Figs. 3 to 6 the only essential modification from the connection member thus far described is in the provision of a valve therein for controlling the discharge into and from the body cavity.

This valve comprises a plug 30 fitting into the body 13a in the direction shown by Fig. 4. There is packing at 31, a screw cap 32 holding the parts in place, and a handle 33 by which the plug 30 is turned.

Fig. 6 shows that the plug 30 has a gateway 35 through it which, in the position there shown, opens into the trap passageway 16c, there being another opening or port 36 at right angles to the port 35 which opens into the port 17 of the body 13a. The position shown in Fig. 6 provides for a discharge of liquid from the source into and through the catheter. Now when the handle 33 is swung to the other side, as viewed in Fig. 5, the port 36 (Fig. 6) moves upward and becomes closed while the vertically shown port 35 is moved into the horizontal position and puts the ports or passageways 17 and 22 into communication with each other. This last-mentioned position provides for the outflow of liquid, gases and solid matter from the body cavity. The port 35 is substantially large in cross area, particularly in view of the solid matter which must pass through it, while the port 36 may be of smaller area since it passes only liquid from the supply.

The liquid trap shown is also important in connection with the valve 30 and for the reasons mentioned in describing the connection device of Figs. 1 and 2. This arises from the fact that while such valves stop water they do not ordinarily stop gas.

Turning to Fig. 5 note the ear-like projections 36 and 37 integral with the body 13a. The handle 33 swings between these projecting elements and for one thing they serve as stops for the handle in its lateral movements. They are functional also in serving as finger supports in operating the valve. This body as 13a with its associated parts shown in Fig. 1 is hanging freely at the end of a flexible tube. With the ordinary type of valve two hands would be required to operate it, one for holding the body and the other for moving the valve. With the finger supports 36 and 37 the handle 30 may be moved from either position to the other by a pinching action between the thumb and finger of one hand. This feature is peculiarly important in an individually-operated flushing device since one hand of the operator is advantageously used at the time in connection with the catheter. The user of this type merely moves the handle 33 back and forth to control the inflow and outflow, while according to the device of Fig. 1 the clips 9 and 25 must each be operated whenever the direction of the flow is changed.

It is to be understood that the body 13a of Figs. 3 to 6 may be applied to the other parts shown in Fig. 1 in place of the body 13, omitting the clips 9 and 25, and for the purposes of the claims the body marked 13 in Fig. 1 may be considered either 13 or 13a. The

apparatus equipped with the connection device of Figs. 3 to 6 is the preferred construction.

Note from Fig. 3 how the passageways marked 17 and 22 incline downward in the direction of flow into the body cavity. I have discovered the peculiar fact that if the inflow be in a horizontal or upwardly-inclined direction past a valve a very considerable quantity of air becomes entrained by the liquid and passes into the body cavity, interfering with the results, while, on the contrary if the intake be downward past such valve, the entraining of air is substantially avoided. Such valves do not ordinarily exclude air, especially after wear. I believe the entraining of air to be overcome in the arrangement shown because of the greater density of the liquid over that of the air, the air being mechanically excluded rather than enveloped by the stream at the valve. This inclination of the passageways 17 and 22 is also advantageous in the return or outflow or discharge since the body gases passing through the device tend to rise, and in passing through the connection device exert a motive force upon the stream and aid the flow of heavy matter therethrough. There is also a siphonic action aiding the discharge, due to the low level of the end of the discharge tube 24.

An important feature of the present device is that it occupies but little space when in use or when put away. It avoids the use of a framework or stand for supporting it. It unites the convenience in use of the simple enema outfit with vastly superior therapeutic results.

In my practice the connection device body is a metal casting. The rubber tubing, catheter, etc. are stock or standard devices or elements well known.

I contemplate as being included in the present invention all such changes, variations and departures from what is thus specifically illustrated and described as fall within the scope of the appended claims.

I claim:

1. In an apparatus of the character described having a source of liquid supply, a tubular applicator, discharge means in communication with the applicator tube through means forming a passageway between the discharge means and the applicator tube, with means for controlling the flow of liquid through the applicator tube and from the applicator tube through the discharge means, the combination therewith of means forming a liquid trap effectively between the source of liquid and said passageway.

2. An irrigator of the character described comprising a container having means for supporting it in an elevated position, a flexible tube leading downward from said container, a body having an intake port in com-

munication with said flexible tube, said body having a passageway therein leading from said intake port to a discharge port, a tubular member including an applicator extending from said discharge port, said body having a second discharge port and which is in communication with the passageway in said body, a discharge tube extending from said last-mentioned discharge port, the passageway in said body forming a liquid trap effectively between said discharge ports.

3. An irrigator of the character described comprising a container for liquid adapted to be supported in an elevated position, a flexible tube leading downward from said container, a body having a hollow interior and being formed to provide an intake port and a passageway therefrom leading to said hollow interior, and to provide two outlet ports with passageways respectively also in communication with said flexible tube and said body being pendant at the end of said tube, an applicator having a single passageway therethrough and being adapted to be inserted in a body cavity in communication with one of said outlet ports, and a flexible tube for discharge in communication with the other outlet port, the passageways for the two outlet ports being downwardly-inclined toward the applicator when the said body is pendant at the end of the intake tube, with means for controlling the flow of liquid from said container through the applicator as one movement of the liquid and then reversely through the applicator and through said discharge tube away from said body as another liquid movement.

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