

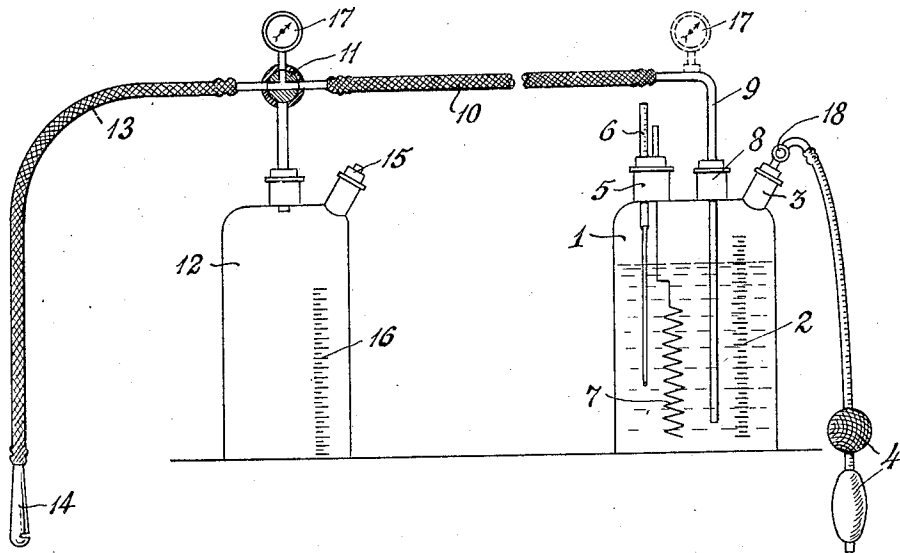
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IRRIGATOR FOR THE INTESTINES, BLADDER, PELVIS, AND THE LIKE

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WITNESS

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## UNITED STATES PATENT OFFICE.

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IRRIGATOR FOR THE INTESTINES, BLADDER, PELVIS, AND THE LIKE.

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In the treatment of the intestines, bladder, pelvis and the like, these organs are frequently filled or flushed with liquids, generally by means of an irrigator. Such irrigators, as is well-known, consist of a container or pan connected by tubing with the pipe or nozzle through which the liquid is discharged. The liquid used for the treatment is filled into the pan and by lifting the latter to the proper level the pressure required for the flushing or like operation is obtained.

Irrigators of this rather primitive type have been used for many years. They do not lend themselves readily to adjustment according to the needs of individual cases; at any rate, they do not afford the possibility of accurate regulation before, during, and after the treatment.

The object of my present invention is to improve irrigators so as to overcome or remove the imperfections noted above. For this purpose, I employ a container in which the liquid used for the irrigating treatment is placed under pressure by means of a pressure-producing device associated with such container, the latter in its preferred embodiment being provided with suitable means for ascertaining and controlling certain factors, and particularly the temperature and the pressure of the liquid. The latter passes from the container through connections including a three-way cock or its equivalent by which the irrigating pipe or nozzle may be placed in communication with a vessel adapted to receive the liquid issuing from the flushed organs. It is not absolutely necessary that all of the features which I have illustrated in connection with the preferred embodiment of my invention, be present together, since some of the advantages of my invention may be secured even when certain of these features are omitted.

The accompanying drawing is an elevation, with parts in section, showing as an example, a satisfactory embodiment of my invention.

The container in which pressure is to be produced consists of a glass bottle 1 having a plurality of necks (a so-called Wolff bottle) provided with a scale or graduation 2 so that the amount of liquid filled into, or left in, the bottle may be ascertained readily at any time. The bottle neck 3 is connected with a bulb 4 of well-known character or other suitable device for producing pressure

within the container 1. Through a second neck, 5, a thermometer 6 for reading the temperature and an electrical device 7 for heating the liquid, extend into the container, through an airtight cork or equivalent closure, so that a pressure above atmospheric may be produced and maintained in the container 1. The third neck, 8, receives (with an air-tight joint) a tube 9 which by means of a suitable conduit, for instance flexible rubber tubing 10, is connected with one of the nipples of a three-way cock 11, supported on a second vessel or bottle 12, which is connected with the second nipple of said cock. The third nipple of the three-way cock is connected by flexible tubing 13 or other suitable means with the irrigating pipe or nozzle 14. The bottle 12 has two necks, one of them being connected with one of the nipples of the cock 11, as mentioned above, and the other neck is shown associated with a vent pipe 15. Furthermore, the bottle 12 also has a graduation or scale 16. At any suitable point of the space in which pressure exists during the operation of the irrigator, I connect with said space a gauge 17 for indicating such pressure. In the specific embodiment illustrated, the pressure gauge is mounted on the casing of the three-way cock 11, in such a way as to communicate with the passage of the plug when the latter connects the tubing 10 with the tubing 13 as shown; the gauge might, however, be placed at any other suitable point, for instance on the tube 9. Luminous graduations of well-known type may be used for this pressure gauge 17, as well as for the scales 2 and 16, so that their indications will be visible in the dark.

The device is used as follows:

The container 1 is filled with the proper amount of liquid, as determined with the aid of the scale 2, and by means of the electric heater 7, this liquid is brought to the desired temperature, as ascertained by the indication of thermometer 6. The irrigating nozzle 14 is then introduced into the organ to be treated, and the three-way cock 11 is placed in the position illustrated, so as to connect tubing 13 with the container 1. Then, by operating the bulb 4 in the well-known manner, air is injected into the container 1, so as to produce, above the level of the liquid, a pressure above atmospheric, such pressure being read off at the gauge

17. The liquid is thus driven from the container 1 through the tube 9, tubing 10, cock 11, tubing 13 and irrigator nozzle 14 into the organ to be treated. It will be evident that pressure and temperature may be varied within wide limits, and kept under perfect control. When the treatment has been completed, the cock 11 is turned anti-clockwise through an angle of 90° so as to bring the tubing 13 into communication with the bottle 12. The liquid will then flow back from the nozzle 14 through tubing 13 and will be received in the bottle 12. A simple subtraction, based on the readings of the scales 2 and 16, will show the amount of liquid retained in the organ under treatment.

The advantages of my improved apparatus are numerous and important. First of all, as has been stated, an accurate regulation of the pressure is readily obtained. Thus there is no danger of producing accidentally pressures so high as to cause injury to the body. Again, the pressure may be increased or decreased as desired during the treatment. Furthermore, within the limits set by the capacity of the bottle 12, the liquid may be withdrawn repeatedly from the organ under treatment, and such organ supplied with fresh liquid from the container 1, by appropriately turning the plug of the cock 11 in one direction or the other. It will be noted that the liquid which has been used for flushing never returns to the container 1, but always flows into the bottle 12. The supply of liquid in the container 1 is thus kept clean and uncontaminated. The manipulation of the apparatus is exceedingly simple and convenient, and the person giving the treatment always has one hand free to direct the nozzle 14. In order that pressure in the container 1 may be regulated, I have provided a vent controlled by a cock 18, by the manipulation of which the pressure in said container may be caused to drop slowly or quickly, according to the extent to which the cock is open. For filling the container 1, and emptying the vessel 12, I remove one of the corks or equivalent neck-closing devices.

It will be understood that various modifications may be made without departing from the nature of my invention as defined in the appended claims. As an equivalent of the three-way cock, I may employ branched tubing with individual clamps or shut-off devices controlling the respective branches thereof; for instance, metal clamps of the kind commonly used in connection with fountain syringes may be employed in this case.

I claim:

1. A device of the class described, comprising a container for the liquid to be used, a gauge for indicating the pressure under which the liquid is in said container, a regulatable vent-controlling device for varying

such pressure, a vessel to receive the liquid which has been used, a nozzle, and controlling means for connecting said nozzle, at the operator's choice, either with said container or with said vessel.

2. In irrigating apparatus the combination comprising a container for the liquid to be used, graduations associated with said container to enable the operator to determine visually at all times the amount of liquid withdrawn from the container, a gauge for indicating the pressure on the liquid within the said container, means for controllably and selectively applying a predetermined degree of pressure, observable by reference to the said gauge, upon the surface of the liquid in said container, an irrigator nozzle for introducing liquid from said container under the pressure established therein into the organ to be affected, a receiving vessel, graduations associated therewith, a branched connection between the irrigator nozzle, the liquid container and the receiving vessel, one branch adapted for establishing communication between said container and said nozzle while the other branch is adapted for establishing communication between said nozzle and said receiving vessel, and controlling means interposed in said connection for causing, at the operator's election, either a flow of liquid from the container to the nozzle or a flow of liquid from the nozzle to the receiving vessel whereby the liquid in any selected amount and under selectively controllable pressure may be caused to flow from the container to the organ to be treated and subsequently be caused to drain into the receiving vessel, the amount returned to the receiving vessel being, by reference to the aforesaid graduations, at once comparable with the amount withdrawn from the container.

3. In irrigating apparatus the combination comprising a container for the liquid to be used, graduations associated with said container to enable the operator to determine visually at all times the amount of liquid withdrawn from the container, a gauge for indicating the pressure on the liquid within the said container, means for controllably and selectively applying a predetermined degree of pressure, observable by reference to the said gauge, upon the surface of the liquid in said container, a controllable heating element effective upon the liquid within the container, a thermometer immersed in said liquid having visible graduations by reference to which the control of the heating element is exercised to establish a selected temperature within the liquid, an irrigator nozzle for introducing liquid from said container under the pressure established therein into the organ to be affected, a receiving vessel, graduations associated therewith, a branched connection between the irrigator

nozzle, the liquid container and the receiving vessel, one branch adapted for establishing communication between said container and said nozzle while the other branch is adapted for establishing communication between said nozzle and said receiving vessel, and controlling means interposed in said connection for causing, at the operator's election, either a flow of liquid from the container to the nozzle or a flow of liquid from the nozzle to the receiving vessel whereby the liquid in any selected amount and under selectively controllable pressure and temperature may be caused to flow from the container to the organ to be treated and subsequently be caused to drain into the receiving vessel, the amount returned to the receiving vessel being, by reference to the aforesaid graduations, at once comparable with the amount withdrawn from the container.

4. In an irrigator the combination comprising a supply container provided with graduations for the liquid to be used, a plurality of ports incorporated in the upper part of said container, a bulb connected with one of said ports for producing in a positive manner a selected pressure within the said container, a gauge for indicating the pres-

sure within said container, an outlet tube secured by a liquid-tight connection within another of said ports and extending to a lower portion of said container for withdrawing liquid from the container, an irrigator nozzle for introducing liquid from and under the pressure within the container to the organ under treatment, tubing connecting said nozzle with said outlet tube, a receiving vessel provided with graduations and operatively connected with said tubing, a three-way cock interposed in said tubing so that the operator may connect said supply container with the irrigator nozzle for introducing a given amount of liquid under the selected pressure produced by the bulb, to the organ under treatment or may connect the said nozzle with the receiving vessel for permitting the used liquid to flow back to the said vessel whereby the amount of liquid retained by the organ under treatment may be ascertained by subtracting the amount returned to the vessel, as indicated by its graduations, from the amount introduced into the organ, as indicated by the graduations on the supply container.

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