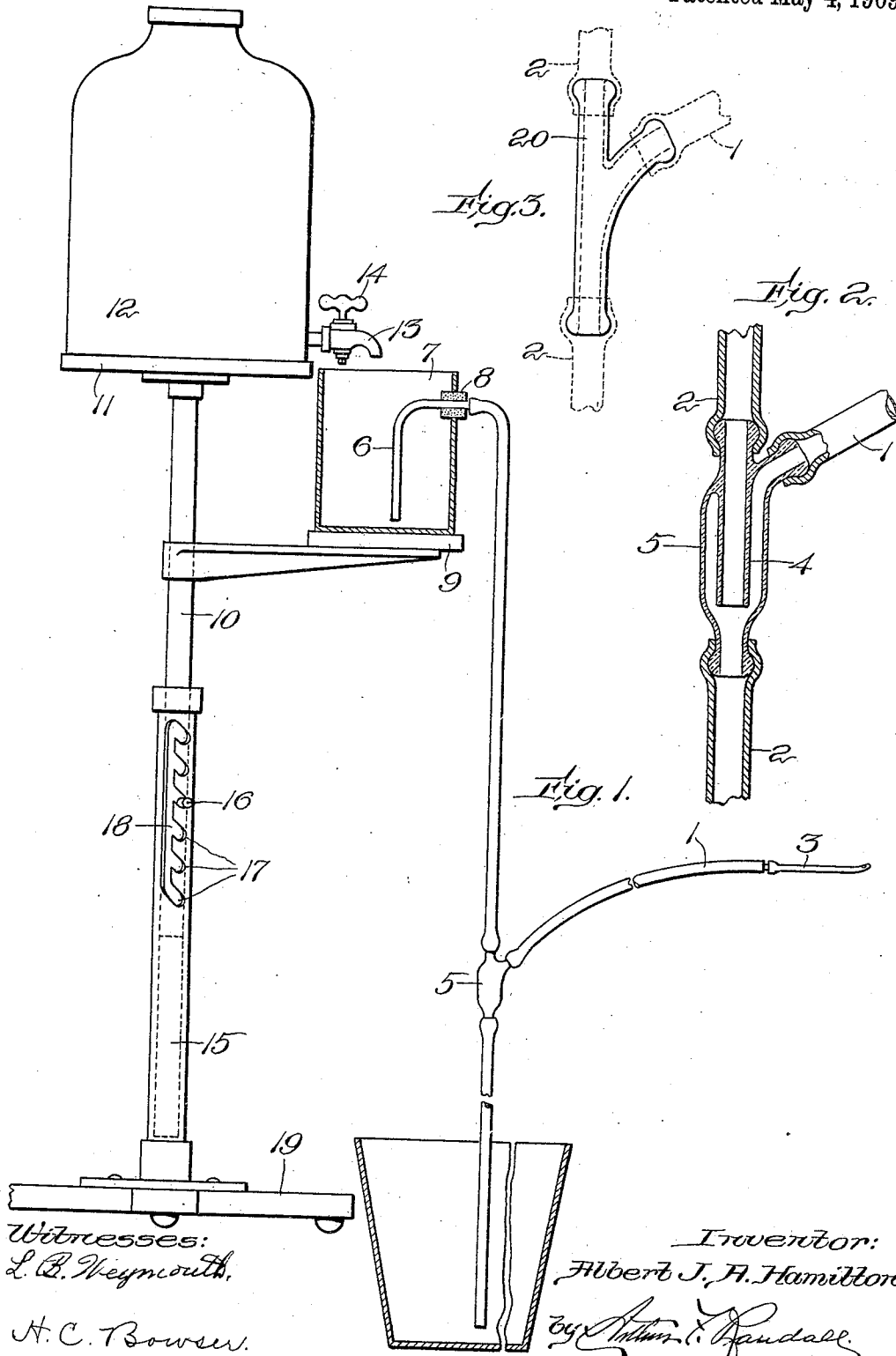


A. J. A. HAMILTON.
DRAINING APPARATUS FOR SURGICAL USE.
APPLICATION FILED OCT. 4, 1907.

920,459.

Patented May 4, 1909.



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UNITED STATES PATENT OFFICE.

ALBERT J. A. HAMILTON, OF MILTON, MASSACHUSETTS.

DRAINING APPARATUS FOR SURGICAL USE.

No. 920,459.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed October 4, 1907. Serial No. 395,870.

To all whom it may concern:

Be it known that I, ALBERT J. A. HAMILTON, of Milton, in the county of Norfolk and State of Massachusetts, have invented an Improved Draining Apparatus for Surgical Use, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which—

Figure 1 is an elevation of a draining apparatus embodying one form of my invention; Fig. 2 is an enlarged detail hereinafter described, and Fig. 3 shows another form of coupling referred to later.

In surgical operations where there are cavities within which fluid tends to accumulate it is necessary in order to facilitate the healing of the wounds, or for other reasons, to remove such accumulations of fluid.

My invention has for its object to provide a simple automatic draining apparatus of improved construction for removing the accumulation referred to, which will be less irritating and less uncomfortable to the patient than those heretofore provided, and which will perfectly drain any cavity of the body so that the wounds attending a surgical operation will readily heal or so that the accumulating fluid will be prevented from interfering with a treatment which a patient may be undergoing.

My improved apparatus comprises a drain conduit adapted at one of its ends to be inserted in the cavity to be drained, and automatic means to intermittently cause the contents of the cavity to discharge from the latter through the drain conduit. Thus by proper timing of the intermittent action of the apparatus the cavity may be kept continually dry automatically, and moreover the period of rest between operations affords relief to the patient which is of importance and not to be had with the devices heretofore proposed.

In the best form of my invention the drain conduit is connected with a second "suction" conduit which in turn is connected with a supply of water or the like; automatic means being provided for intermittently discharging a quantity of the water from the supply through the suction conduit. The passage of the water through the second or suction conduit acts by suction to start the flow of the fluid contents of the cavity through the drain conduit, said fluid passing into the suction conduit and being discharged therefrom with the water.

Other features of my invention are herein-after pointed out.

Having reference to the drawings 1 represents the drain conduit and 2 the suction conduit, each being herein shown as made up in most part of rubber tubing. To one end of conduit 1 is connected a catheter 3 adapted to be passed into the bladder or into any other cavity. At its other end conduit 1 is connected with a glass bulb 5 forming part of the suction conduit 2 and into which projects a short tube 4 to which the upper section of conduit 2 is connected. At its upper end conduit 2 is connected with a bent glass tube 6 that extends through the wall of and down into a vessel 7, the tube 6 being surrounded by a tight cork bushing 8 where it penetrates the wall of vessel 7. The vessel 7 is supported by a shelf 9 projecting from a stem 10 and the latter is made with another shelf 11 to support a comparatively large reservoir 12 holding water or the like. At the bottom of reservoir 12 is a pipe 13 discharging into vessel 7 and controlled by a valve 14.

The lower portion of stem 10 extends loosely into a hollow post 15 and is provided with a laterally projecting pin 16 to engage with one or the other of a series of notches 17 opening into a slot 18 formed in post 15 so as to provide for supporting post 10 with provision for vertical adjustment to vary the height of vessel 7 as may be required. At its lower end post 15 is fixed to a base 19 resting on the floor.

If desired the conduits 1 and 2 may be connected by a simple Y-shaped coupling 20, as shown in Fig. 3, or any other suitable joint.

The conduit 2 including the glass tube 6 constitutes a siphon whose longer leg has the conduit 1 connected to it, while the conduit 1 together with the lower part of conduit 2 constitutes another siphon. Thus when vessel 7 is filled with water and the latter overflows into conduit 2, the siphon 2, 6 will be started and this in turn will start the siphon made up of conduit 1 and the lower part of conduit 2. This latter siphon will then continue in operation until the bladder of the patient is emptied of urine even though the siphon 2—6 operate but momentarily. That is to say it is only necessary that the capacity of vessel 7 be sufficient to start the flow of urine from the bladder after which said flow will continue until the bladder is emptied of its contents. Thereafter all

strain on the patient is relieved until the vessel 7 is again filled by water discharging from reservoir 12. The discharge of water from reservoir 12 through pipe 13 into vessel 7 is continuous and is regulated by the valve 14 so that by adjusting valve 14 the apparatus is timed to operate automatically and intermittently at such predetermined intervals of time as required by the patient.

10 Of course when the apparatus is used to drain other cavities than the bladder the catheter 3 may be dispensed with and, if necessary, a tip of another character substituted.

With draining devices as heretofore constructed the suction has been continuous and uninterrupted with the result that when used to drain the bladder and the latter was emptied of its contents and collapsed the membranes of its lining would be drawn by the suction into and clog the catheter so that further draining of the bladder would be prevented, the device thus being rendered inoperative allowing the bladder to fill with urine. With my improved apparatus the intermittent action obviates this objection.

What I claim is:

1. A draining apparatus for surgical use comprising a drain conduit adapted at one end to be inserted in the cavity of a body, and automatic means to intermittently cause the discharge of the contents of the cavity through the drain conduit.

2. A draining apparatus for surgical use comprising a drain conduit adapted at one end to be inserted in the cavity of a body; a suction conduit with which the other end of the drain conduit is connected; and automatic means to intermittently produce a flow of water or the like through the suction conduit.

3. In an apparatus of the character described in combination a drain conduit adapted at one end to be inserted in the cavity to be drained; a siphon suction conduit having the other end of the drain conduit connected with its longer leg; a vessel into which the shorter leg of the siphon suction conduit extends; and means to supply water or the like to said vessel.

4. In an apparatus of the character described in combination a drain conduit adapted at one end to be inserted in the cavity to be drained; a siphon suction conduit having the other end of the drain conduit connected with its longer leg; a vessel into which the shorter leg of the siphon suction conduit extends; a reservoir for water and the like; and an outlet from said reservoir discharging into said vessel.

5. In an apparatus of the character described in combination a drain conduit

adapted at one end to be inserted in the cavity to be drained; a siphon suction conduit having the other end of the drain conduit connected with its longer leg; a vessel into which the shorter leg of the siphon suction conduit extends; a reservoir for water or the like; an outlet from said reservoir discharging into said vessel; and means to regulate the flow through said outlet.

6. In an apparatus of the character described in combination a drain conduit adapted at one end to be inserted in the cavity to be drained; a siphon suction conduit having the other end of the drain conduit connected with its longer leg; a vessel into which the shorter leg of the siphon suction conduit extends; a reservoir for water and the like; an outlet from said reservoir discharging into said vessel; and a vertically adjustable support for the vessel.

7. A draining apparatus for surgical use comprising a conduit adapted at one end to be inserted in the cavity of a body; a suction device connected with said conduit and automatic means to intermittently operate the suction device.

8. In an apparatus of the character described, in combination, a drain conduit adapted at one end to be inserted in the cavity to be drained; a suction conduit, and means to intermittently discharge a torrent of water through the suction conduit to exhaust the drain conduit.

9. In an apparatus of the character described, in combination, a drain conduit adapted at one end to be inserted in the cavity to be drained; a suction conduit; an aspirator in said suction conduit with which the drain conduit connects, and automatic means to intermittently produce a flow of water or the like through the suction conduit and aspirator to exhaust the drain conduit at predetermined intervals.

10. In an apparatus of the character described, in combination, a drain conduit adapted at one end to be inserted in the cavity to be drained; a siphon suction conduit having the other end of the drain conduit connected with its longer leg by an aspirator; said aspirator; a vessel into which the shorter leg of the siphon suction conduit extends, and means to continuously supply water or the like to said vessel so that it overflows at predetermined intervals into the siphon suction conduit to empty said vessel and exhaust the drain conduit.

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