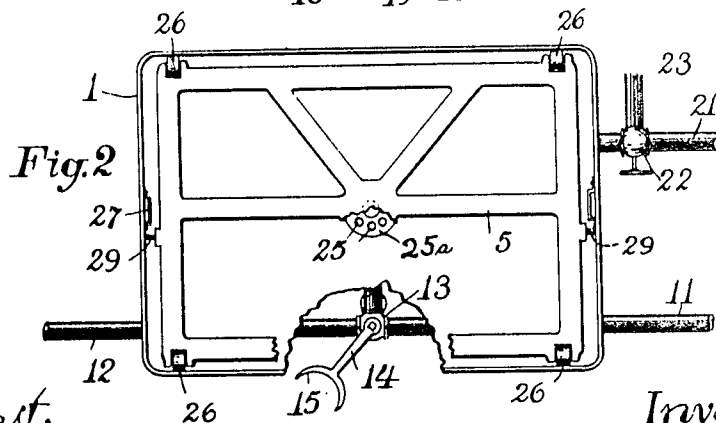
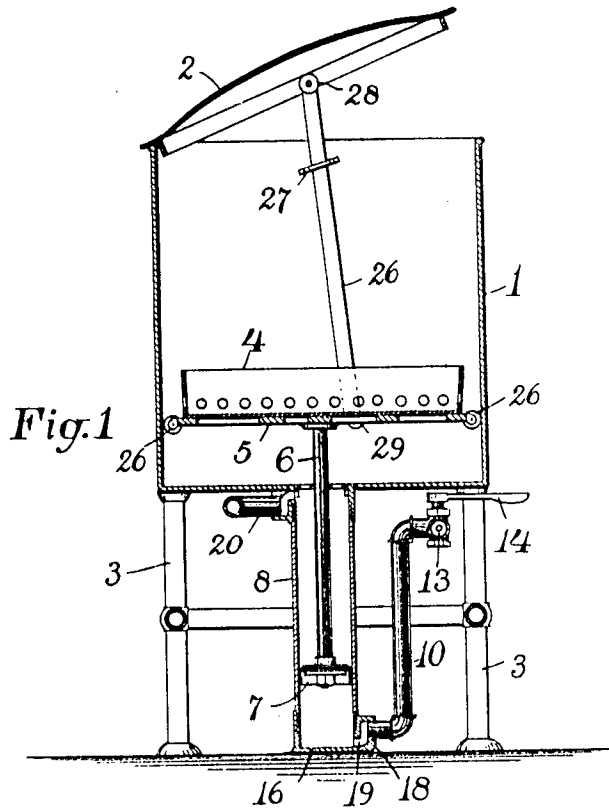


R. P. BARNSTEAD.
STERILIZER.
APPLICATION FILED MAY 25, 1908.

1,039,243.

Patented Sept. 24, 1912.
2 SHEETS—SHEET 1.



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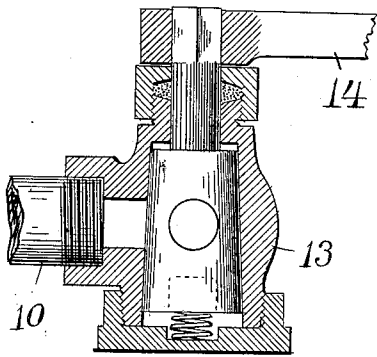


Fig. 4

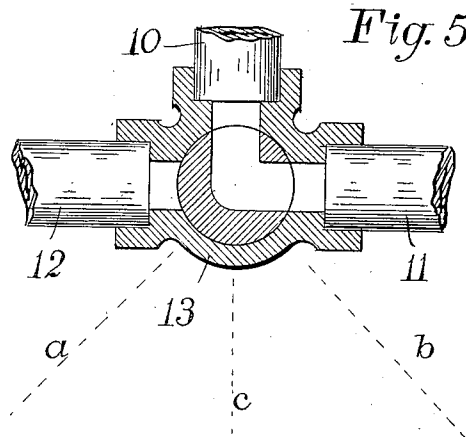


Fig. 5

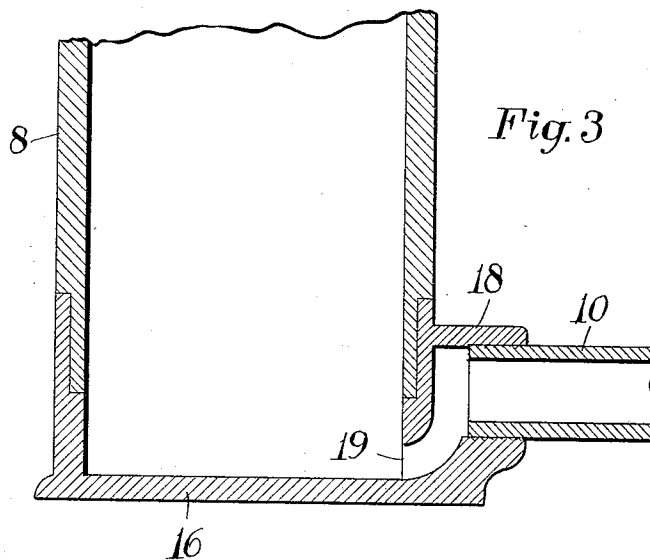


Fig. 3

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UNITED STATES PATENT OFFICE.

ROBERT P. BARNSTEAD, OF BOSTON, MASSACHUSETTS.

STERILIZER.

1,039,243.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed May 25, 1908. Serial No. 434,772.

To all whom it may concern:

Be it known that I, ROBERT P. BARNSTEAD, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sterilizers, of which the following is a specification.

In sterilizers for surgical utensils and appliances, it is customary to place the same in a shallow receiver adapted to be submerged in a tank containing a sterilizing solution.

The object of this invention is the construction of improved means for raising and lowering such receiver, and also for simultaneously opening and closing the tank-cover. For such purpose, I prefer to employ water under pressure acting upon a piston connected with said receiver, directing the water to and from the cylinder containing such piston, by means of a knee-controlled valve.

Referring to the drawings forming part of this specification, Figure 1 is a central, transverse, vertical section of a sterilizer embodying my invention. Fig. 2 is a plan view of the same with a part broken away and the cover removed. Fig. 3 is a sectional elevation of the lower part of the operating cylinder shown on a larger scale. Fig. 4 is a central vertical section of the three-way valve used in connection with the apparatus. Fig. 5 is a horizontal section of the same.

The sterilizer tank 1, with which my improvements are connected, is provided with a hinged cover 2, and mounted upon a suitable supporting frame 3. The receiver or tray 4 is supported upon a skeletonized shelf 5 which is fixed upon the upper end of the piston rod 6, the latter being provided at its lower end with a leather piston or plunger 7 movable within the cylinder 8.

Water under pressure being let into the cylinder beneath the piston, the shelf is elevated sufficiently to bring the tray 4 above the level of the sterilizer solution in the tank, and to hold the same at such point while the treated utensils are being removed, and as long thereafter as may be desired. By allowing the water within the cylinder to escape to any suitable waste, the tray descends by the weight of itself and contents down into the solution again. To thus control the operating fluid, whether water, air under pressure or steam, the pipe 10 which

opens into the base of the cylinder, is brought up to approximately the level of the bottom of the tank, and there connected with both the water intake pipe 11 and the waste pipe 12. At such juncture is a three-way valve 13 controlled by a knee-operated lever 14. The lever being swung to the position *a* in Fig. 5, the water from the intake 11 flows to the pipe 10 and thence into the cylinder; if swung to the point *b*, the pipe 10 is put into communication with the waste pipe 12; while if swung to the intermediate position *c*, all communication to and from the cylinder is shut off.

I prefer to form the extremity of the lever 14 with a rounded fork 15 into which the operator can press her knee in operating the same, and so more positively control it.

The casting 16 which forms the bottom head of the cylinder 8, has a boss 18 into which is tapped the end of the pipe 10, and the opening in said boss between the pipe-end and the cylinder is given a downward inclination in order to bring the mouth 19 flush with the bottom of the cylinder-space. The object of this is two-fold, first, to enable the plunger to descend to as low a point as possible without shutting off the water-inlet. The second object is that while thus permitting the plunger to descend to the bottom of the cylinder, enough water will be permitted to remain at such bottom, and which will not be forced up and out through the pipes 10 and 12, to insure the continued moistening of the leather plunger 7 and its consequent pliability and readiness for immediate use. A similar arrangement is provided for the connection with the upper end of the cylinder of the pipe 20, which is joined to the water-inlet pipe 21 and waste pipe 23, and communicates with either or neither by means of a suitable three-way valve 22, as indicated in Figs. 1 and 2. By this method of connecting the intake and exhaust pipes to the upper end of the cylinder and having the latter formed with an opening or openings 25 up into the tank, the latter can be filled or emptied without further openings through its walls than the one provided for the cylinder.

I prefer to have the circular member 25^a through which are the small holes 25, and through which rises the piston rod 6, adapted to be removable in order that at any time the shelf 5 and piston 7 can be withdrawn,

both for purposes of cleaning the parts, and for renewing or repairing the piston and its packing.

To keep the shelf 5 from turning on the rod 6 as an axis and rubbing its corners against the interior of the tank when rising and falling, and so badly scratching the surface of the latter, the shelf is provided with an antifriction roll 26 near each corner, as shown in Figs. 1 and 2.

To cause the cover 2 to automatically open and shut as the tray rises and sinks, the bars 26 are pivoted to the ends of the shelf 5 and passed up through the confining-straps or eyes 27 fixed to the tank. At the upper end of each bar is an antifriction roll 28. When the shelf rises, said rolls are pressed upward against the cover and force it to open synchronously therewith. By having the pivotal points 29 in advance of the confining-straps 27, the bars 26 are made to cant over more and more as they rise, and so open the cover to substantially its full width. By thus having the cover rest upon these bars, it can be raised by hand at any time without interference. Hence should, through any possible means, the shelf-raising means refuse to work, the attendant can instantly raise the cover by hand and so have access to the utensils in the tray. This is a most important feature, inasmuch as in surgical operations there must be no possibility of the sterilized articles being kept for a moment out of reach.

In using this sterilizer, the attendant,—in case the shelf is down within the liquid,—presses with her knee the lever 14 over toward the left, and thereby causes the water under pressure to enter the cylinder and raise the piston, shelf and tray. She can then attend to some other duties, and return to the sterilizer when the opened position of the cover shows the tray to be suitably elevated. It can do no harm if she delay somewhat her return, inasmuch as when the plunger reaches the cylinder-top, it comes to rest and no further water can enter. The utensils having been placed in the tray, the attendant applies her knee to the forks of the lever 14 and swings it to its extremity of right-hand movement, and can then as before attend to other tasks; for, when all the water has been forced from beneath the plunger, the shelf is at the bottom of the tank. The lever can therefore remain in this position without detriment, the only utility of the intermediate position *c* of the lever being that it enables the tray to be held at any level intermediate of the above-described extremes.

What I claim as my invention and for which I desire Letters Patent is as follows, to wit:—

1. The combination with a sterilizer tank, of a cylinder located beneath the same, a

piston fitted to the cylinder and having a piston rod rising therefrom within the tank, a shelf supported by said rod, and means for admitting fluid under pressure to the cylinder beneath the piston.

2. The combination with a sterilizer tank, of a cylinder located beneath the center of the same, a piston fitted to the cylinder, a piston rod rising from the piston into the tank, supporting devices carried by said rod, means for admitting fluid under pressure to the cylinder beneath the piston, and closing means for said means.

3. The combination with a sterilizer tank, of a cylinder fixed beneath the center of the bottom of the tank, a piston fitted to the cylinder, a piston rod rising from the piston into the tank, a shelf fitted to receive the upper end of the rod, and means for introducing a fluid under pressure to the cylinder beneath the piston.

4. The combination with a tank, of a cylinder fixed beneath the center of the bottom of the tank, a piston fitted to the cylinder, a piston rod rising from the piston, a removable guide penetrated by the rod and located at the juncture of the cylinder and tank, means for introducing a fluid under pressure to the cylinder beneath the piston, and valve-controlled pipes connected to the upper end and the lower end of the cylinder.

5. The combination with a tank, of a cylinder fixed beneath the same, a piston fitted to the cylinder, a piston rod rising from the piston into the tank, an object-carrying means supported by said rod, a pipe communicating with the lower end of said cylinder and rising to a point close beneath said tank, a fluid receiving pipe and a discharge pipe both communicating with the upper end of the first-named pipe, and a three-way valve at the juncture of said pipes and controlling the same.

6. The combination with a tank, of a cylinder fixed beneath the same, a piston fitted to said cylinder, a piston rod rising from said cylinder into the tank, an object-carrying means supported by said rod, a pipe communicating with the lower end of said cylinder and rising to a point close beneath said tank, a three-way valve at the upper end of said pipe, a fluid receiving pipe and a discharge pipe both controlled by said valve and communicating through it with the first-named pipe, and a lever having a bifurcated free end and adapted to control said valve.

7. The combination with a sterilizer chamber, of a shelf thereof, fluid-pressure means for elevating said shelf, a push-bar pivoted at its lower end to an end of said shelf, a confining eye loosely receiving said bar and fixed to the chamber near its upper edge, an antifriction roll at the upper end of said bar, and a hinged cover contacting with said

roll; said pivotal point being in advance of said eye.

5 8. The combination with a sterilizer chamber, of a vertical cylinder communicating at its upper end with the bottom of the chamber, a plunger in the cylinder, a shelf supported by said plunger, means for admitting fluid under pressure beneath said plunger, and a pipe connected with said cylinder
10 close to its upper end for admitting and removing fluid through the latter to the chamber.

9. The combination with a sterilizing chamber, of a cylinder located below the

center of the bottom thereof, a plunger in 15 said cylinder, a piston rod rising from the plunger into the chamber, a shelf supported by the rod, and antifriction rolls carried by the shelf adapted to contact with the inner sides of the chamber and to thereby 20 keep the latter from wear by the shelf.

In testimony that I claim the foregoing invention, I have hereunto set my hand this 22 day of May, 1908.

ROBERT P. BARNSTEAD.

Witnesses:

A. B. UPHAM,

WARREN N. AKERS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."