

June 27, 1950

G. E. LEWIS
STERILIZER

2,512,747

Filed April 29, 1948

2 Sheets-Sheet 1

FIG. 1.

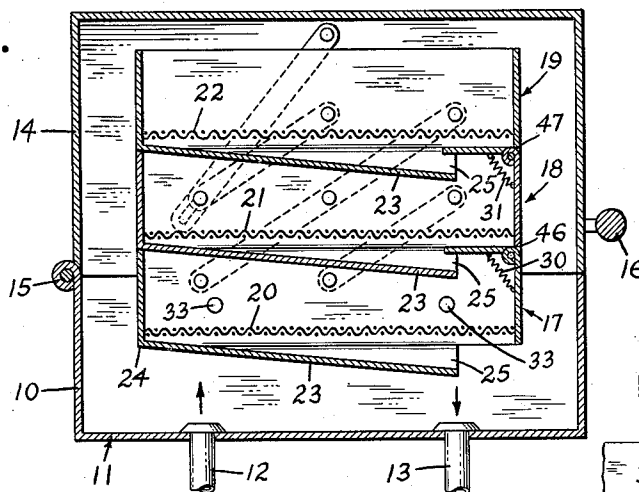


FIG. 3.

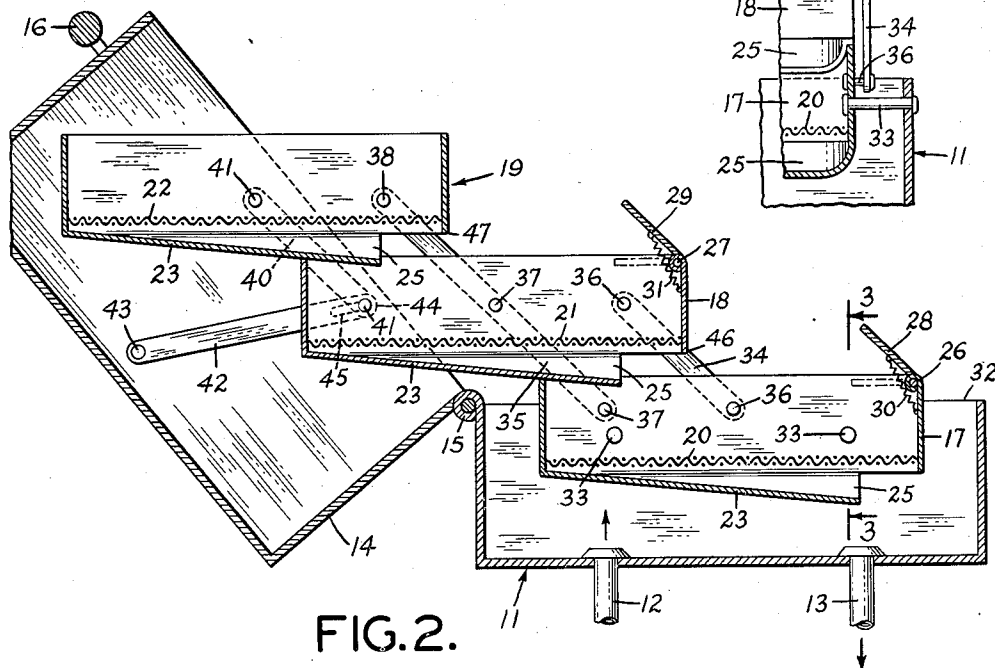
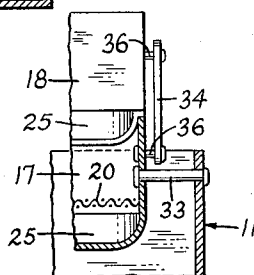


FIG. 2.

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2 Sheets-Sheet 2

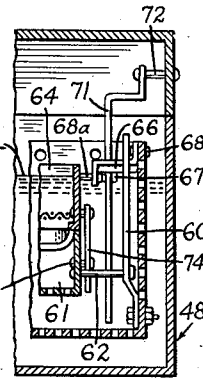
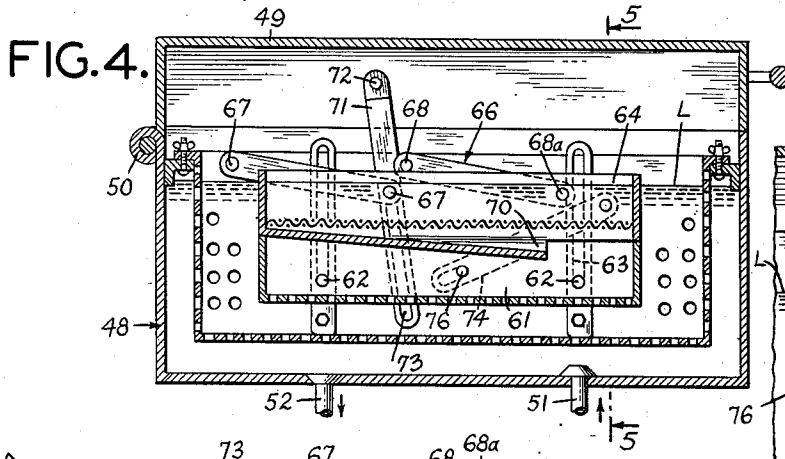


FIG. 5.

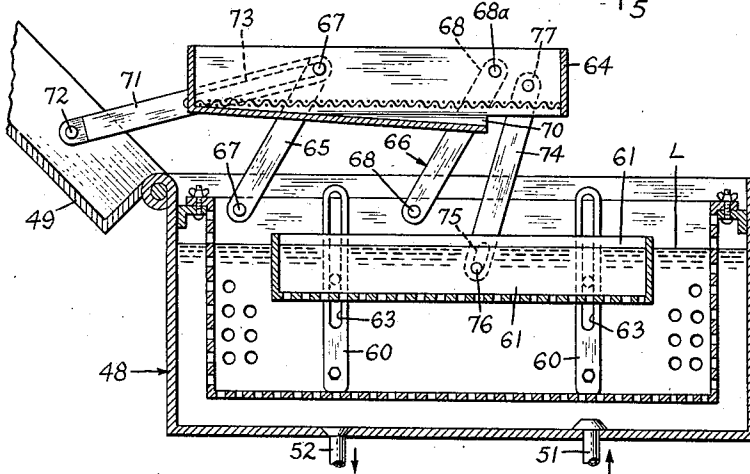


FIG. 6.

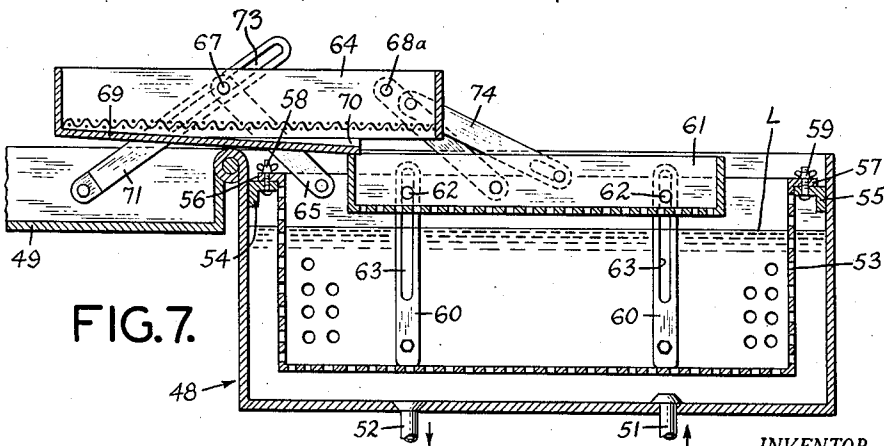


FIG. 7.

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STERILIZER

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Application April 29, 1948, Serial No. 23,921

5 Claims. (Cl. 21—83)

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This invention relates to sterilizers; more particularly to sterilizers operating with aqueous fluids or steam.

It is an object of my invention to provide a sterilizer commonly employed by surgeons, physicians, and dentists to sterilize the operative instruments by steam or boiling water which serves both to cleanse the instruments as well as to render them antiseptic. Known to me is the provision of sterilizers wherein a casing, in the form of a steam box or water boiler, is provided with a closure or lid to retain the heat of steam or boiling water over a tray or basket in which the surgical instruments are placed for the purpose afore-indicated. The common practice of grouping interests, especially by dentists, places an unusually heavy burden upon the sterilizer equipment which they may employ, and where the dentists may have a single nurse in service, present-day sterilizers have been found inadequate, especially in the limited space which these practitioners may require.

It is, accordingly, an object of my invention to effect substantial economies in the aforementioned instrumentality whereby either steam or water sterilizers may have, in a common steam box or boiler, a plurality of trays or baskets by which the useful capacity of these receptacles may be immeasurably increased without effecting substantial change such as may be required in piping water drains or steam lines to the sterilizer and thereby effect substantial economies in space and equipment.

It is contemplated by my invention and an object thereof to provide a sterilizer operating by steam or boiling water, wherein the single manipulation of a pivotal lid exposes one or more trays for making accessible a large number of instruments retained on said trays for selection of use and to thereby more economically use the space occupied by sterilizers. It is contemplated further by my invention to provide a sterilizer in which a plurality of trays may be stacked to increase the capacity of the sterilizer, whether by steam or water, and without impairing the efficiency of the sterilizing action or the circulation of the sterilizing medium about the instruments to be cleansed and sterilized, and further characterized by an integration of the manipulation of the multiple trays so employed to make the various trays accessible for inspection, loading, or unloading while relating the trays in a position so that the sterilizing medium is confined to the steam box or boiler receptacle.

In general, it is an object of my invention to

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provide a sterilizer which operates with great facility and effects substantial elements of economy in use and production.

To attain this object and such further objects as may appear herein, as will be hereinafter pointed out, I make reference to the accompanying drawings forming a part hereof, in which—

Figure 1 is a sectional view of a steam sterilizer in accordance with one embodiment of my invention, with the sterilizer lid closed;

Figure 2 is a section of the same sterilizer with the lid moved to the open position;

Figure 3 is a fragmentary sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a sectional view of a sterilizer in accordance with another embodiment of my invention intended to employ boiling water as the sterilizing medium;

Figure 5 is a fragmentary sectional view taken on the line 5—5 of Figure 4; and

Figures 6 and 7 are views showing the progressive positions assumed by the trays in pivoting the lid to the open position.

Making reference to the drawings, Figures 1 and 2 show a steam box 10 through whose bottom 11 there are connected lines 12 and 13 for supplying steam and draining the vessel by suitable valve means not shown and which do not form any part of my present invention. The receptacle 10 has a lid 14 hinged by the hinge 15 and including a handle member 16 for moving the lid 14 from and to the overlying position. I may resort to hand operation of the lid or employ well-known linkage, either hand or foot-treadle operated, to secure more or less remote control of the movement of the lid to leave the hands free, in a manner well known in this field.

In accordance with the embodiment illustrated in Figures 1 and 2, I provide a plurality of trays 17, 18, and 19, each of which has continuous side wall portions adjacent the bottom of which there is supported a foraminous bottom 20, 21, 22, respectively. Spaced from the rim of each tray there is provided a vane 23 connected adjacent the edge 24 and sloping downwardly to provide an outlet 25 for purposes which will appear hereinafter as this description proceeds.

Trays 17 and 18 each has adjacent the corners 26 and 27 hinged baffles 28 and 29, including resilient spring members 30 and 31 normally to urge the baffles outwardly. With the construction thus described, the tray 17 is mounted in the bottom member 11 adjacent the rim 32 thereof by cross-pins 33 which hold the tray 17 centered transversely of the bottom section 11. The

tray 18 is connected to the tray 17 by links 34 and 35 employing pivot pins 36—36 and 37—37 on the trays 17 and 18, respectively, which are spaced apart in parallelism. The link 35 extends for double the distance to have its outermost end attached by the pivot pin 38 to the tray 19. A link 40 has its opposite ends 41, 41 connected to the trays 18, 19 by pivot pins or rivets. The relationship of the lengths of the links 34, 35, and 40 is to maintain the trays connected in parallelism in movement from the position shown in Figure 1 to the position shown in Figure 2. A connecting link 42 has one end 43 pivoted to the lid 14; its opposite end 44 has a guide slot 45 which rides on the pin 41. The limits of the slot 45 serve in one position to engage the pin to draw the tray assembly from the stacked position to the echelon position and then hold the cover member 14 against further pivotal movement. In the opposite position the slot ends engage the pin 41 to initially raise the trays 18 and 19 and then stack them into the position shown in Figure 1. In approaching the stacked position, the corners 46 and 47 will first clear the edges of the baffles 28 and 29 and thereupon depress the same into the position shown in Figure 1. The assembly comprising the stacked trays, the vanes 23, and the baffles 28 and 29, in connection with the open-ended tray 19, serves to provide a circulating path of the sterilizing fluid or steam circuitously so that a lateral as well as an upward movement of the steam or like liquid vapor is effected to pass over the instruments which may be positioned upon the foraminous bases 20, 21, and 22. Stratification or channeling of the sterilizing vapor is thereby avoided in the stacked position of the trays. When the lid 14 is moved to expose and make accessible the instruments in the various trays by pivoting the trays to the echelon position, the condensate of steam in the trays gravitates from the uppermost tray 19 along the vanes 23 from one tray to another and thereupon into the bottom vessel 11 for drainage through the discharge line previously described.

By the construction described, sterilization by steam or like vapor may be effected of a plurality of trays of instruments in a single chamber or chest, the vanes and baffles in the embodiment illustrated cooperating in the closed position of the chest to prevent stratification of the vapor and assure sweeping the sterilizing vapor over the instruments; whereas in the open position, the vanes serve to effect drainage of the condensate from the uppermost tray to the lowermost tray into the bottom member 11, maintaining the use of the assembly tidy.

Referring now to the embodiment illustrated in Figures 4 to 7, I show a water boiler chest 48 which has a lid 49 hinged adjacent the top by the hinge 50. The inlet line 51 and outlet line 52 for water are shown more or less diagrammatically, since the particular manner in which the sterilizing liquid is to be added or taken from the chest 48 forms no particular part of my present invention. Within the chest 48 there is suspended a foraminous basket 53 which is spaced from the walls of the chest by the brackets 54 and 55. An overhanging rearward flange 56 and a forward flange 57 rest on the brackets 54 and 55, respectively. Thumb screws 58 and 59 hold the basket in the bracket-engaging position removably. Within the basket I provide guides 60 slidably to hold the tray 61 by pins 62 which ride in the slots 63 of the guides. The slots 63 are extended to

permit sliding movement vertically of the tray 61 from a lower position completely immersed within the fluid to be used for sterilization, or to an upper position, shown more clearly in Figure 7, wherein the upper limits of movement are above the normal liquid level of fluid within the chest 48. An upper tray 64 is provided with links 65 and 66 for pivotal movement by the end pins 67—67 and 68—68 to direct the movement of the tray 64 in parallelism from the stacked position shown in Figure 4 to the echelon position shown in Figure 7. As in the prior embodiment, the trays 61 and 64 are formed with foraminous bottoms. In this example, however, the upper tray 64 is formed with a draining vane 69 providing an outlet 70 into the tray 61 in the echelon position shown in Figure 7. The lid 49 has a link 71, whose end 72 is pivoted to the link by a rivet. The link 71 at its opposite end is formed with a slot 73 to engage the upper pin 67 on the side wall of the tray 64 by a lost-motion coupling action. The link 74 has its lower end formed with a slot 75 engaging a pin 76 on the lower tray 61. The upper end of the link 74 has its end 77 connected to the tray 64 engaging the pin 68^a.

The assembly thus far described, in its normally closed position shown in Figure 4, retains the trays 61 and 64 below normal liquid level of the chest 48. Upon tilting the lid 49 upwardly, the lid, through the link 71, first slides the slot over the pin connecting the same to the tray 64 with lost motion until the limit of the slot has been reached, whereupon all engagement of the end wall thereof with the pin 67 serves to draw the tray pivotally in parallelism about the pins 67 and 68. The link 74 is thereupon drawn upwardly with a tilting movement, with lost motion with relation to the pin 76, until the limit of the slot has been reached, whereupon it lifts the tray 61 upwardly along the guides 63 in parallelism. The limiting position is reached where the lid 49 is pivoted rearwardly, whereupon the tray 61 clears the liquid level L, permitting drainage to the water from the instruments through the foraminous bottom. The upper tray 64 may drain along the vanes 69 into the chest or the upper tray, maintaining a tidy condition on the support for the sterilizing devices.

In reversing the operation, the lid 49, upon being brought to the closing position, serves to urge the link 71 thereon against the outer pin 67 along the slot 73 until it abuts said pin to begin tilting action of the tray about the pivots 67 and 68 on the links 65 and 66. The action releases the tray 64 to gravitate into the chest. It will be understood that I may augment the gravitational movement of the tray 61 by spring means normally tending to maintain the tray 61 in a retracted position, or I may provide other means for guiding the tray 61, such as by pantograph linkage, for moving the tray in parallelism from its lowermost position upwardly when drawn by the link 74 to clear the liquid level.

It will be observed that in the embodiments described, manipulation of the lid tends to draw the overlying trays into an echelon position where they may drain gravitationally from one tray into the other and then into the chest. It will also be observed that the arrangement for draining one tray into the other serves in the sterilizing position to avoid channeling of the circulating sterilizing medium. Thus, I provide a medium for raising the trays from within the sterilizing liquid to a zone where the instruments mounted thereon may be reached readily for

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selection or arrangement to increase the utility of the sterilizing chamber and effect substantial economies as well as facility in use of the device.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is:

1. In a sterilizer having a lidded chest within which sterilizing fluid may circulate, a plurality of instrument trays, including linkage for stacking the same in superimposed position, said trays being foraminous, and including baffles mounted on a side wall of said trays for circulating said sterilizing fluid transversely over said trays, and means comprising vanes staggered with relation to said baffles to cascade the sterilizing fluid into said chest upon moving said trays outwardly from said chest, said vanes cooperating with said baffles to minimize channeling and stratification of said sterilizing fluid in circulating through and over said trays.

2. A sterilizer comprising a chest adapted to contain a sterilizing fluid, a plurality of instrument trays arranged therein in superimposed position, a lid for said chest, means to hinge said lid to said chest, parallel links connecting the uppermost of said trays with the walls of the chest and means connecting said lid and links for lifting said trays vertically to a point above the chest, and to pivot the uppermost tray substantially entirely outside the plane of the vertical walls of said chest, with a portion overlapping one of said underlying trays, the uppermost tray having enclosing side and end walls and a bottom formed with draining orifices, and a draining vane beneath said bottom sloped to incline in the direction of the overlapping portion of said tray for drainage of the fluid from said overlying tray

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into said chest, the linkage for the superimposed tray uncovering an underlying tray, and guiding the lowermost underlying tray substantially within the plane of the vertical walls of the chest.

3. A sterilizer comprising a chest in accordance with claim 2 wherein the lowermost underlying tray includes guides restraining said tray for movement vertically.

4. A sterilizer comprising a chest in accordance with claim 2 wherein the depth of the chest extends to retain a liquid sterilizing fluid to cover the stack of trays and the guide for the lowermost tray is extended to direct the lowermost tray above the liquid level in said chest, while restraining the same within the plane of the vertical walls of the chest, as described.

5. A sterilizer comprising a chest in accordance with claim 2 wherein said drainage vane of a superimposed tray extends substantially over an underlying tray to position the outlet from said drainage vane closely adjacent the underlying tray, and provide a circulating bath, minimizing channelling of the sterilizing fluid.

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