March 10, 1942. D. A. MEEKER ET AL 2,275,788

STERILIZER

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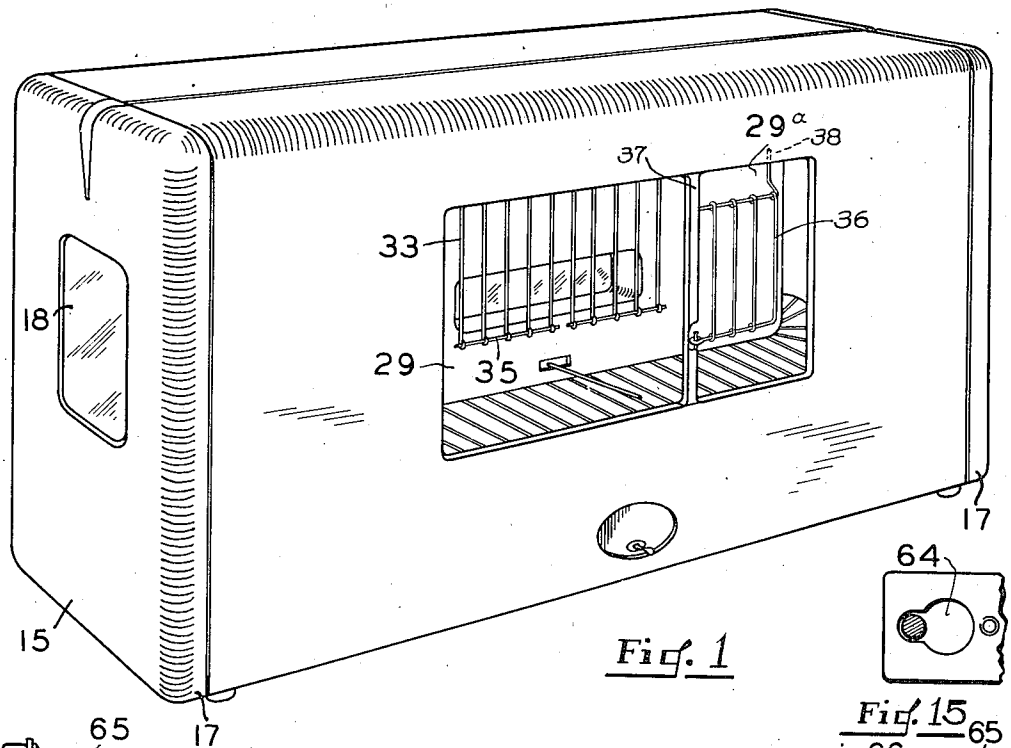


Fig. 1

Fig. 15

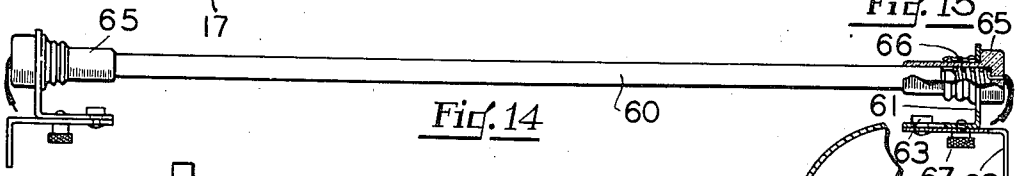


Fig. 14

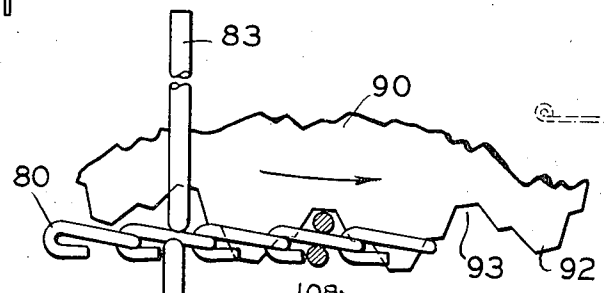


Fig. 11

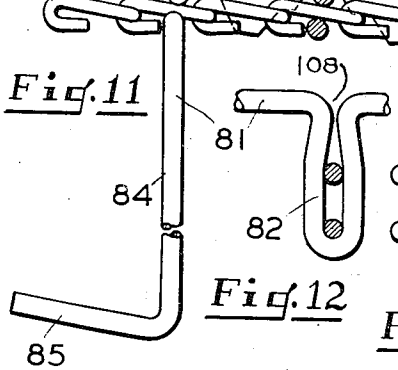


Fig. 12

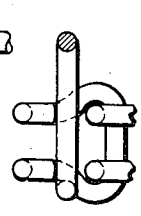


Fig. 13

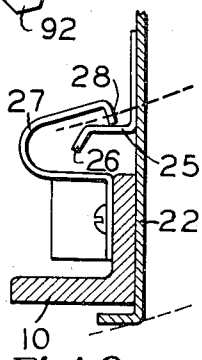


Fig. 9

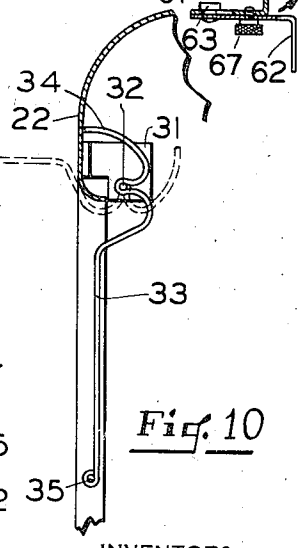


Fig. 10

INVENTORS
David A. Meeker and
LeRoss D. Wallace
BY
Maréchal & Hoe
ATTORNEYS

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STERILIZER

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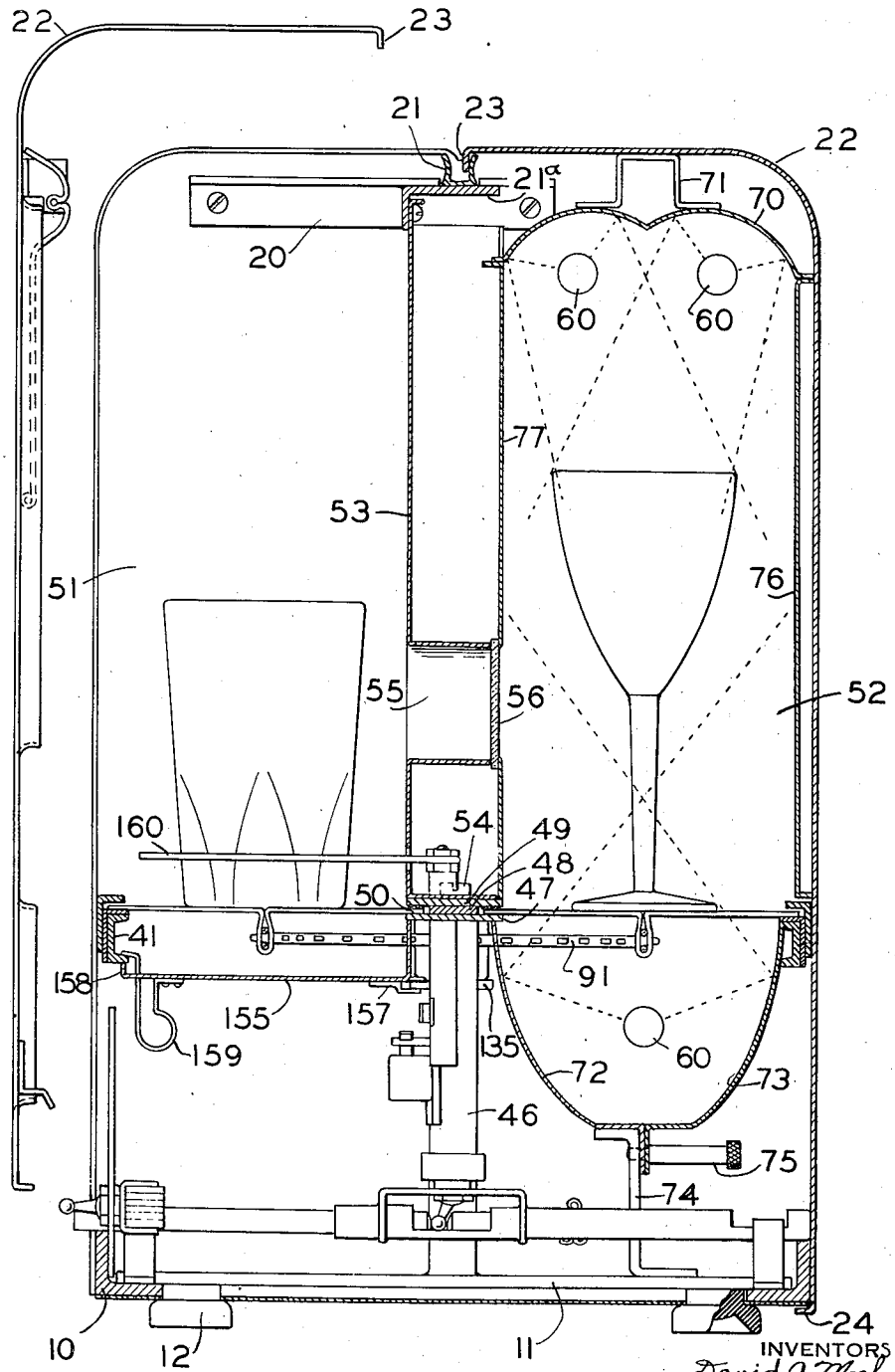


Fig. 2

INVENTORS
David A. Meeker and
DeLoss D. Wallace
BY
Marschall & Noe
ATTORNEYS

March 10, 1942. D. A. MEEKER ET AL 2,275,788

STERILIZER

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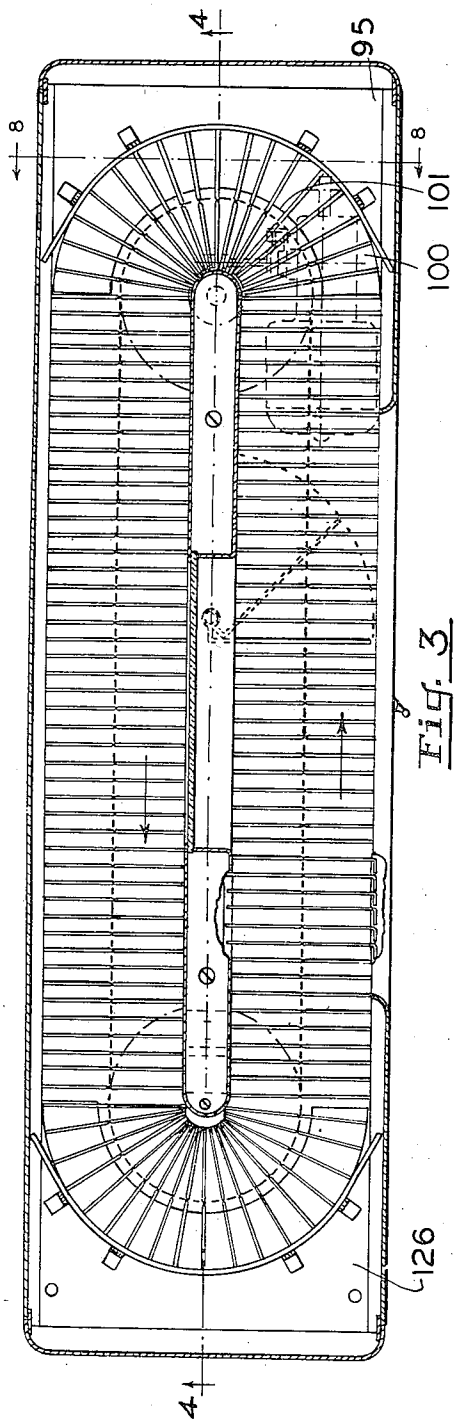


Fig. 3

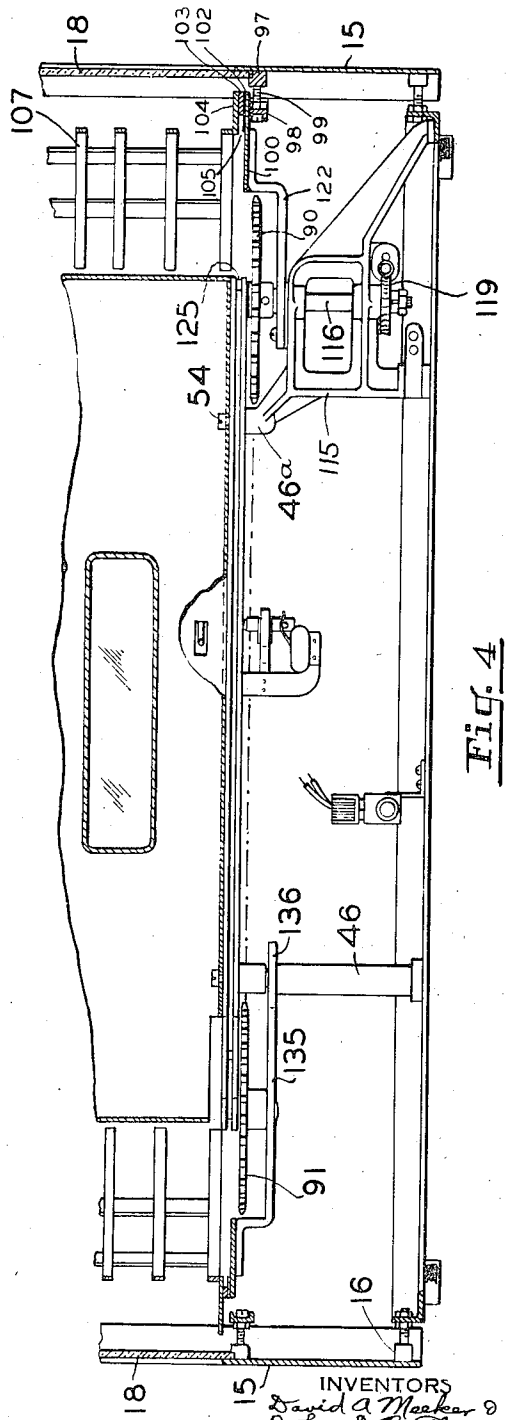


Fig. 4

INVENTORS
David A. Meeker &
DeLoss D. Wallace
BY
Maréchal & Noe
ATTORNEYS

March 10, 1942. D. A. MEEKER ET AL 2,275,788

STERILIZER

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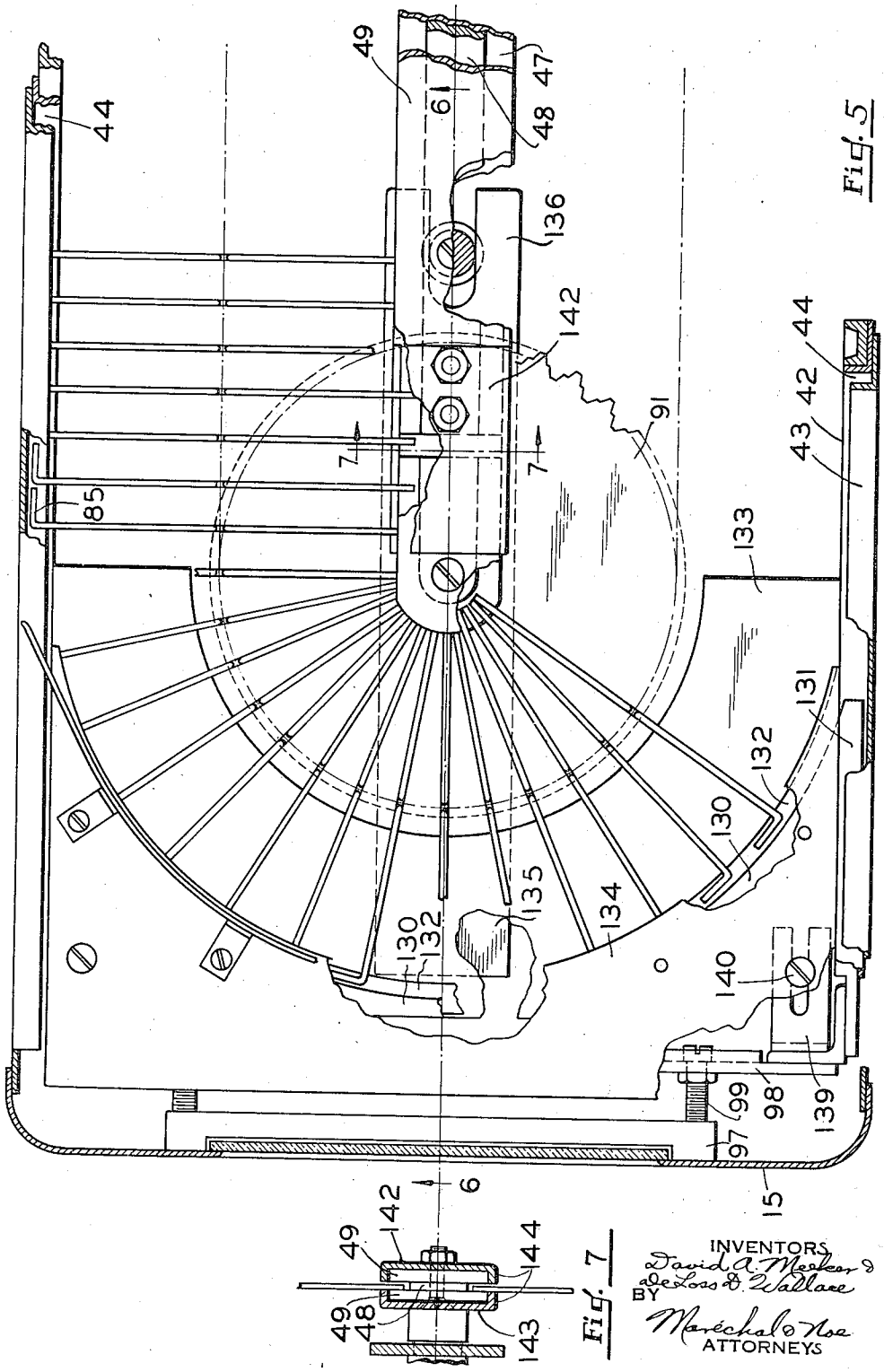


Fig. 5

Fig. 7

INVENTORS
David A. Meeker &
DeLoss D. Wallace
BY
Marechal & Noe
ATTORNEYS

March 10, 1942. D. A. MEEKER ET AL 2,275,788

STERILIZER

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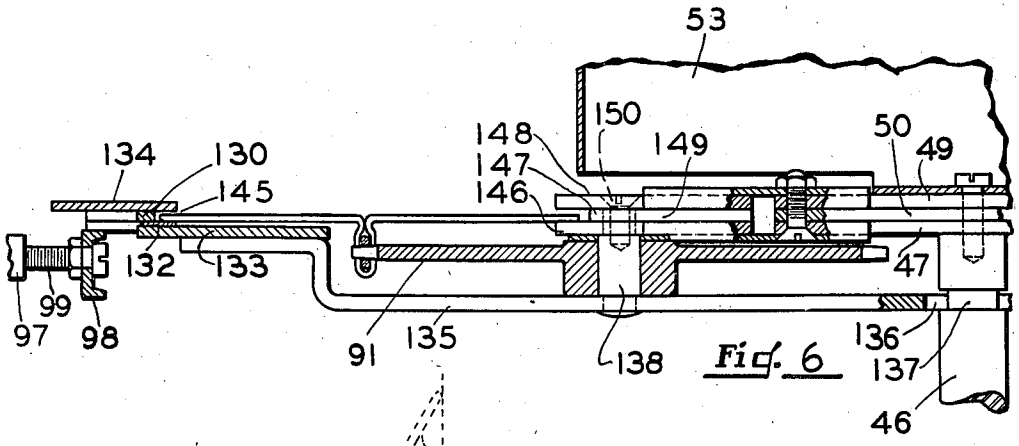


Fig. 6

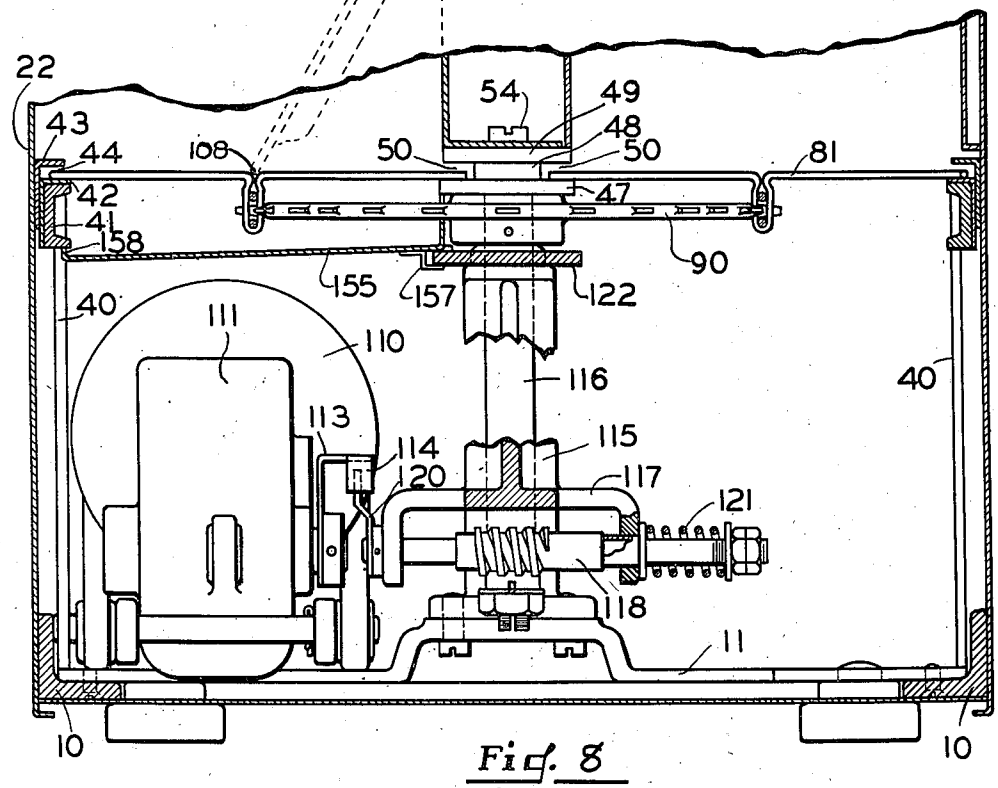


Fig. 8

INVENTORS
David A. Meeker and
DeLoss D. Wallace
BY
Marechal & Noe
ATTORNEYS

March 10, 1942. D. A. MEEKER ET AL 2,275,788

STERILIZER

Filed Feb. 1, 1939 6 Sheets-Sheet 6

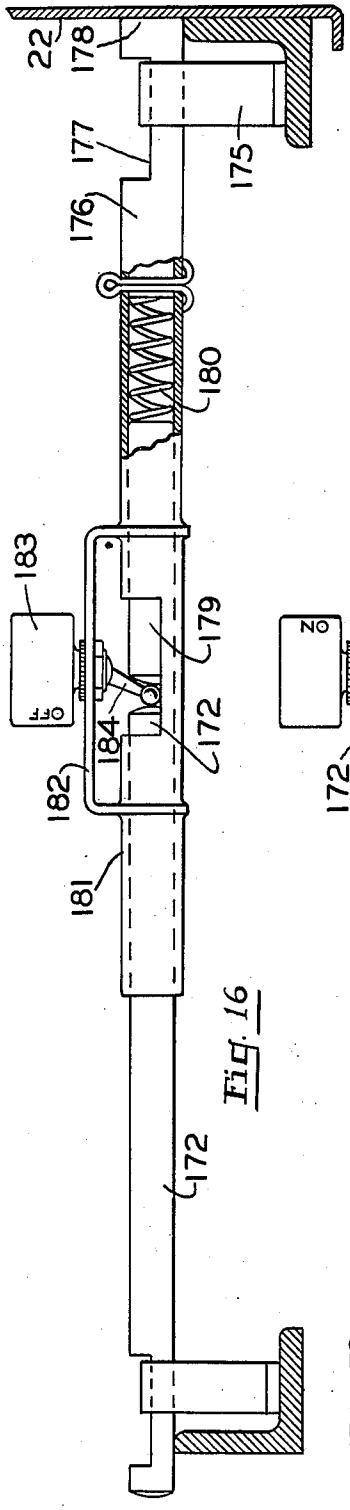


Fig. 16

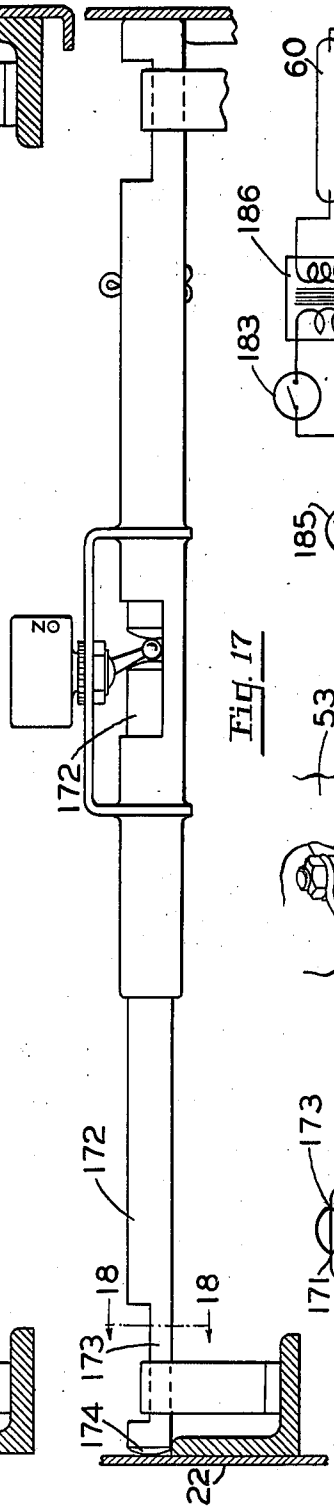


Fig. 17

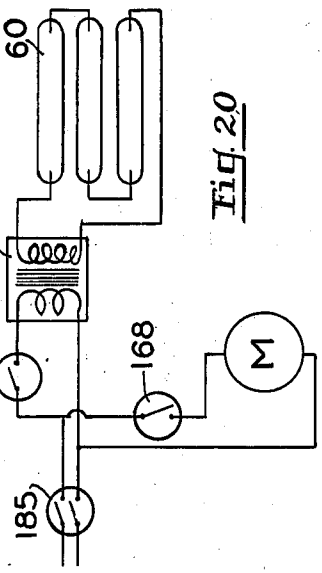


Fig. 20

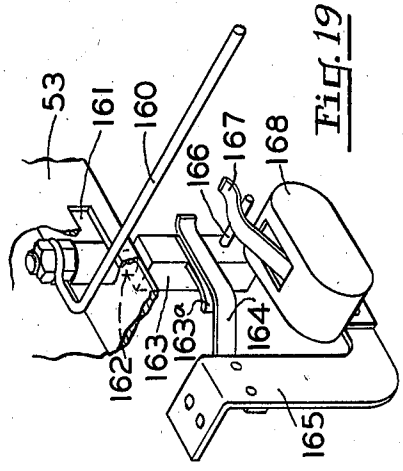


Fig. 19

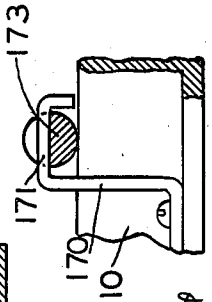


Fig. 18

INVENTORS
David A. Meeker and
Delos D. Wallace
BY
Maréchal & Noe
ATTORNEYS

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2,275,788

UNITED STATES PATENT OFFICE

2,275,788

STERILIZER

David A. Meeker and De Loss D. Wallace, Troy, Ohio, assignors to The Hobart Manufacturing Company, Troy, Ohio, a corporation of Ohio

Application February 1, 1939, Serial No. 254,004

20 Claims. (Cl. 250—52)

This invention relates to sterilizing devices and more particularly to a cabinet for receiving dishes, glassware, and the like, and subjecting the same to a sterilizing radiation.

It is a principal object of this invention to provide a sterilizing device adapted to receive glassware, dishes, and the like, and to subject such articles to a sterilizing radiation to provide for the delivery of the same in sterile and sanitary condition available for use.

It is a further object of the invention to provide a device of this character which is compact in size, attractive in appearance, and which is adapted to be placed upon a counter, back bar, or the lke and to occupy a minimum of counter space.

It is a further object to provide such a device adapted to be positioned upon a counter, to receive articles, to subject the articles to a sterilizing radiation, and to return the sterile articles to a discharge position adjacent the receiving position.

It is also a further object to provide in a device of this character a novel and highly satisfactory conveyor requiring a minimum of space and which offers minimum obstruction to the sterilizing radiation.

It is a still further object to provide in a sterilizer of this construction a conveyor adapted to be automatically controlled in response to the need for sterile articles, the conveyor supplying freshly sterilized articles as they are removed for use.

It is a further object to provide a sterilizer of this character adapted to be readily maintained in a clean and sanitary condition throughout, and in which accidental injury to the eyes of the user from the source of sterilizing rays is effectively prevented during use as well as during the cleaning operation.

Other objects and advantages will be apparent from the following description, the accompanying drawings, and the appended claims.

In the drawings Fig. 1 is a perspective view from the operator's side of a sterilizer device constructed in accordance with the present invention;

Fig. 2 is a vertical sectional view through the device with one of the side wall panels removed;

Fig. 3 is a horizontal sectional view taken through the device above the conveyor with certain parts being broken away to show the conveyor structure;

Fig. 4 is a partial vertical sectional view on the line 4—4 of Fig. 3;

Fig. 5 is a view in plan of the conveyor showing the left hand portion thereof with certain parts broken away;

Fig. 6 is a partial vertical sectional view on the line 6—6 of Fig. 5 showing the left hand end of the device;

Fig. 7 is a vertical sectional view on the line 7—7 of Fig. 5.

Fig. 8 is a partial vertical sectional view across the device on the line 8—8 of Fig. 3 with certain parts removed to show the construction of the drive for the conveyor;

Fig. 9 is a detail sectional view showing the means for retaining the cover panels in assembled position;

Fig. 10 is a partial vertical sectional view showing the guard means preventing insertion of articles on the conveyor in the position of discharge therefrom;

Fig. 11 is a partial view in plan showing the detail structure of the conveyor mechanism;

Figs. 12 and 13 are vertical sectional views at right angles through the conveyor chain showing details of the construction thereof;

Fig. 14 is an elevational view with parts broken away to show the mechanism for mounting the tubes which produce the sterilizing or ultra-violet light;

Fig. 15 is a detail view of the same structure;

Fig. 16 is a view in elevation with parts broken away showing the structure of the interlocking means for controlling the operation of the sterilizing lamps;

Fig. 17 is a view similar to Fig. 16 with the parts in a different position of adjustment;

Fig. 18 is a detail view showing a portion of the interlocking structure on the line 18—18 of Fig. 17;

Fig. 19 is a view in perspective showing the means for controlling the operation of the conveyor mechanism in response to the demand for the use of sterilized articles; and

Fig. 20 is a schematic view showing the circuit connections.

Referring to the drawings which disclose a preferred embodiment of the invention, there is shown at 10 a lower main frame member in the form of an angle which extends around the entire lower periphery of the device, and to which are fastened longitudinal cross pieces 11 forming therewith supporting structure. A plurality of friction members 12 made of rubber or the like material are fastened to the lower side of the frame to provide for supporting the device in suitable nonslipping manner.

The entire device is enclosed in a casing to provide for maintaining the interior in a clean and sanitary condition, and likewise to prevent escape of the sterilizing light rays with possibly injurious effects upon the eyes and skin of the operator. For this purpose end casing members 15 formed of suitable sheet metal material are fastened to the end frame members 10 and spaced therefrom by suitable means 16. Each casing member 15 encloses the entire end of the device and is likewise formed with right angularly projecting portions 17 which extend around toward the side walls of the device. There is also preferably provided in each end of the device a window 18 adapted to transmit enough of the rays to present a pleasing and attractive appearance. Such window if made of ordinary glass has the property of filtering out bactericidal or injurious rays, transmitting the visible non-injurious rays.

The end casing members 15 are provided with brackets 20 at their upper portions upon which there is positioned a reinforcing angle 21a which supports upwardly opening channel member 21, parts 21 and 21a extending from one end of the device to the other. This channel serves to provide a strong and rigid structure, and likewise serves as a support for removably receiving the side cover panels 22. These side panels extend to the center of the device, and each panel is provided with a downwardly projecting flange 23 adapted to be received within the open channel 21. The panel continues across the top, and downwardly over the entire side wall of the device, also being formed with an inwardly projecting flanged part 24 at its lower end for fitting under the side frame member 11 and to provide proper rigidity in the side panels.

In order to provide for removably retaining the side cover panels 22 in place, means are provided to resiliently receive the panels when in operative position, but providing for withdrawal thereof from operative position when access to the interior of the cabinet is desired for cleaning, repair, or the like. This means comprises brackets 25 fastened to the inner wall of each panel adjacent the lower corners thereof, such brackets having a downwardly inclined end portion 26. To the side frame 10 is bolted a curved resilient member 27 its end extending upwardly and turned down at the terminal edge 28 thereof. In placing the side cover panels in operative position, the upper end flange 23 is engaged in the channel 21, and the side wall then lowered into operative position. Because of the fact that this operation takes place substantially about the channel 21 as a center, the brackets 25 and more particularly the ends 26 thereof swing in substantially the arc indicated by the dotted line in Fig. 9. Thus it will be seen that when the end 26 of the bracket first engages the edge 28 of the locking finger, it will force the locking finger upwardly, and with further pivotal movement of the side cover panel into its final position, the retaining member 27 tends to engage the bracket to yieldably hold the cover panel in such assembled position. The panel is thus firmly held in position but may be readily removed when desired by the operator taking hold of the lower flange 24 and withdrawing the panel from the action of the retaining means 27.

The side panel 22 which covers the operator's side of the device is formed with an opening 29 to provide access to the interior of the device in the normal use thereof. The opening as shown in Fig. 1 is preferably divided into a larger part 29 adapted to provide access to the discharge station and into a smaller part 29a providing access to the receiving station by a column which is removable so that a single opening may be formed if desired. The receiving position and the discharging position are thus adjacent each other so that the device requires only a shallow depth of supporting space and is arranged for convenient accessibility for the operator.

The receiving and discharging stations being adjacent it is preferred to provide a means to assure that the operator will not inadvertently place articles to be sterilized upon the conveyor within the discharge station but will be required to place them in the receiving station so that they will traverse the machine and be sterilized before being returned to the discharge station. This means comprises a framework 30 in the form of a grille as shown in Figs. 1 and 10. Brackets 31 are fastened to the inner side of cover panel 22 above the opening 29 and a cross rod 32 is supported therein. A plurality of depending wire guards 33 are looped around rod 32 and extend downwardly terminating in spaced relation with respect to the lower edge of opening 29. The wire guards are likewise provided with upwardly projecting extensions 34 which are curved to engage the wall of cover panel 22 at substantially right angles when the guard stands in normal vertical position. The lower ends of the wires 33 may be left free or joined by cross rod 35 as shown to cause two or more of the wires to move together as a group. It will be clear from the foregoing that the operator may reach into the device beneath the framework 30 to grasp an article for removal. During withdrawal thereof the framework swings outward freely as shown in Fig. 10 and effectively the entire discharge opening is available for use. But if it is attempted to insert an article into the discharge station, the framework is prevented from swinging inwardly, and assurance is thus provided that the operator will not inadvertently place articles into the device except through opening 29a which has no framework thereover.

There may be additionally provided a means to prevent removal of articles from the receiving position and through the receiving aperture so that it will not be possible to remove articles after they have been placed in the device until they have passed through the sterilizing chamber. Such means comprises an auxiliary framework or grille 36 associated with the opening 29a and hinged, with a resilient means tending to return it to the position shown, about a vertical axis on removable column 37 carried on cover panel 22. The grille is arranged to swing freely inwardly but has a projecting part 38 which engages the channel above opening 29a to prevent outward swinging of the grille. Hence an article can be inserted through opening 29a but having been placed on the carrier cannot be withdrawn from that aperture.

Inwardly of the side and end wall casing panels there is provided a frame structure for the conveying device. Frame members 40 extending upwardly from angles 10 provide support for a channel member 41 opening inwardly from each longitudinal side of the device. An angle plate 42 is carried by the channel on the upper side thereof, and a second angle plate 43 is fastened in position in spaced relation above plate 42, leaving a horizontal inwardly opening slot 44 extending along both side walls.

Centrally of the lower frame, and mounted upon cross braces 11, there are positioned a pair of supports or posts 46 and 46a which extend upwardly into substantially the same horizontal plane as channel members 41. Mounted upon the upper ends of the posts 46 and 46a is an assembly of relatively narrow elongated plates. This assembly comprises lower plate 47, and intermediate plate 48 of less width than plate 47, and an upper plate 49 of substantially the same width as plate 47. These plates which extend throughout the central portion of the device provide on each side of the central area thereof a horizontally open slot 50 which is so arranged that it lies in the same horizontal plane with the opposed slots 44 above described.

In order that the device may have suitable dimensions for positioning upon a counter, or back bar, where the available depth is substantially limited, the entire device is arranged in elongated rectangular form, and provision made as above described for positioning the articles to be sterilized and for removing the articles after the sterilization has been effected, from the same side of the device. The receiving and discharging area 51 is accessible through opening 29 and 29a, and to avoid objectionable escape of the sterilizing rays, the interior of the device is shielded to form a separate area of compartment 52 in which the sterilizing action takes place, the articles while being passed through such sterilizing compartment being subjected to the action of suitable ultra-violet or similar rays adapted to have a germicidal action with respect to any bacteria or the like present upon the articles. A central partition or shield indicated generally at 53 extends between the two compartments 51 and 52, and serves to prevent objectionable escape of the sterilizing rays from the sterilizing compartment. This partition in the form of a metal plate is relatively narrow, so as to not require any more space than necessary for the operation of the conveyor, and is suitably fastened over the posts 46 above the triple plate assembly 47, 48 and 49, and held in place on the posts along with the plate assembly by bolts 54. Plate 53 is formed with a narrow recess 55 which extends over a portion of its length, and this aperture is filled by a light transmitting plate 56 through which the sterilizing compartment is clearly visible to the operator to ascertain that the sterilizing lamps are functioning properly and to provide for transmission of such light as to present an attractive appearance. As above described the use of ordinary window glass effectively avoids transmission of any objectionable degree of ultra-violet radiation.

Within the sterilizing compartment 52 there are provided a plurality of light sources 60 such as elongated tubes adapted to cause the generation of ultra-violet or similar germicidal light rays. Preferably two such tubes are positioned adjacent the upper portion of the compartment, and a single such unit positioned in the lower portion of the compartment beneath an article supported on the conveyor. The units may be suitably held in place by means of brackets 61 fastened to other brackets 62 which in turn are carried by end plates 15. Studs 63 are fastened to bracket 62 and have shouldered heads extending upwardly therefrom adapted to receive keyhole slots 64 formed in brackets 61. Sockets 65 are carried upon brackets 61 opening toward each other to receive the tube 60, resilient means 66 being positioned in each socket to yieldably retain the tubes in place and the studs 63 in locked position in the small diameter part of slots 64. The sockets may be moved toward each other against the action of the resilient means to move the bracket 61 so that the large diameter part of the slot 64 surrounds the stud in which position the bracket may be upwardly released and the tube then removed from the socket. Shouldered locking screws 67 are threadedly received in brackets 61 and passing through slots in brackets 62, engage the latter to detachably secure the parts in assembled relation.

Reflector means are provided within the sterilizing compartment for reflecting the sterilizing rays toward and upon articles passing through such compartment. The reflector means preferably comprises an upper curved reflector plate 70 fastened by means of brackets 71 to the rear cover panel 22 and suitably arched over each of the upper units and two lower oppositely placed generally parabolically shaped reflectors 72, 73 supported upon a bracket 74 from the cross brace 11. The outer one of said reflectors 73 is removably held in position by thumb screws 75 providing for removal for cleaning purposes. Additional highly polished and light reflecting means are provided along the side walls of the compartment, comprising a reflecting plate 76 carried by the rear cover panel 22. Such reflector may be provided with an aperture cooperating with a similarly positioned aperture in cover panel 22 and enclosed by a glass plate or the like, to provide for viewing the interior of the compartment. A similar reflecting plate 77 is positioned along the inner wall of the sterilizing compartment for the reflecting rays which impinge thereon toward the articles passing through the compartment, such plate 77 being apertured to correspond with the viewing opening 55 on the operator's side of the device.

This arrangement of reflectors provides for securing substantial uniformity in the radiation produced throughout the vertical extent of said sterilizing compartment so that short articles for example will receive substantially the same effective radiation as tall glasses, particularly around the edge or lip thereof. Thus a tall glass rises closer to the tube immediately above it and thus receives ample direct and reflected rays from that tube; a shorter glass receives not only the direct rays from both tubes, but a large amount of reflected radiation from both tubes directed downwardly thereupon by the reflectors 70. Side reflectors 76, 77 and lower reflectors 72, 73 provide for directing the rays toward and upon all parts of the article so that it is subjected to complete and thorough sterilization.

Means are provided for receiving the articles within the device, conveying them through the sterilizing chamber, and delivering the sterilized articles back to a position substantially the same as the receiving position. In order that the articles may be thoroughly and completely subjected to the sterilizing action, the conveyor is preferably so constructed as to offer a minimum of interference with or impedance to the action of the light rays in impinging upon the entire surface of the article. Likewise to avoid the necessity for any enlargement in the depth of the device, the conveyor is so constructed as to provide for laterally carrying the article through the receiving chamber, then transporting it

around to the sterilizing chamber, conveying the article in the reverse direction through the sterilizing chamber and then returning the sterilized article to the discharge position closely adjacent the receiving position and accessible for removal through opening 29. The receiving chamber where the articles are received and discharged extends longitudinally along one side of the casing in parallel relation with the sterilizing chamber which extends along the other, the two chambers being separated by a relatively narrow partition or wall.

The conveyor proper comprises a sprocket chain 80 made up of a plurality of links such as shown in Figs. 11 to 13. The chain runs vertically on edge with the sprocket wheels in a horizontal plane, and looped around each alternate link there is provided a wire 81 formed with the downwardly looped part 82 crimped around and engaging the chain link. The wire is formed with an inwardly projecting arm 83, and an outwardly projecting arm 84, these arms being in alignment and lying substantially normal to the chain and in a generally horizontal plane. The outwardly projecting arm 84 terminates in an angularly bent trailing part 85 which lies in the same plane as the arms. The inner arm 83 is adapted to be slidably received within the slot 50 formed between the plates 47 and 49; similarly the outer arm including the trailing end part 85 is adapted to be received within the slot 44 formed between members 42 and 43. The portion 85 is of such length in relation to the spacing of the wire loops upon the sprocket chain as to cause each trailing end to substantially contact the next subsequent wire when the wires stand in position at substantially right angles with respect to the chain. Hence this structure provides for the moving forward of the sprocket chain with the accompanying forward movement of each of the wire loops, the loops being maintained in substantially parallel position throughout such movement, and standing at all times in a substantially perpendicular direction between the two guiding slots.

The chain thus passes through the receiving and discharging compartment and likewise through the sterilizing compartment substantially centrally between the outer side frame members 42, 43 and central partition 53 and in the direction of the arrows in Fig. 3. At the end adjacent the receiving zone the chain passes around a sprocket wheel 90 and at the end adjacent the discharge zone around sprocket wheel 91. Each sprocket is constructed as shown in Fig. 11 with a plurality of outwardly projecting teeth 92 which engage in the chain to drive the same, and is provided with inwardly cut notches 93 corresponding with the position of the loops upon the chain. The chain is thus engaged in driving relation, and the wire loops are received within the notched portions of the sprocket wheels without interference therefrom.

In order to provide for the operation of the conveyor in substantially a semi-circle at either end of its passage, means are provided for properly guiding both the inner ends and the outer ends of the conveyor supporting loops, such means providing for free movement of the respective ends of the wire loops to provide for the fanning out of the outer ends thereof as required in order to circle around for travel in the reverse direction. At the end 95 toward which the articles are first carried when placed within the machine, the means for guiding the outer ends of the wire loops comprise cooperating plates forming an arcuate guide slot as a continuation of and in the plane of the lateral slots 44. For this purpose each end panel 15 is provided with cross bars 97 fastened inwardly thereof to which is bolted the frame member 98 by means of bolts 99. At the end 95 there is positioned on frame member 98 in fixed relation thereto a lower plate 100 having an inner cut-out portion 101 arranged to extend radially just beyond the sprocket wheel and lying somewhat above the plane thereof so as to be spaced only slightly below the conveyor loops 84. On the plate 100 there is positioned a relatively light gauge plate 102 upon which the outer ends of the conveyor loops are adapted to rest in guiding and supporting relation. An intermediate plate 103 is located above plate 102 and is mounted in the same plane as and slightly radially beyond the ends of the wire loops affording clearance so as to avoid contact of the ends of the wire loops as they pass around in their orbit. On top of plate 103 and extending inwardly a short distance over the ends of the wire loops is a top plate 104 which forms with the lower plates the arcuate slot 105 in the same plane as and directly communicating with the slots 44 formed by members 42 and 43 in which the wire loops may travel with continuous motion as they pass around the end of the conveyor. And the provision of the inwardly extended portion of plate 100 serves to receive and support such small articles as might slip between the loops at the end zone. Since the spacing of the wires at the sprocket chain itself remains the same, the spacing increasing radially outwardly of the sprocket wheel and decreasing inwardly thereof, this plate need only approach the periphery of the sprocket wheel in order to afford adequate protection against the dropping of any articles between the wires.

It is found in practice that the movement of the wire supporting loops beneath articles, even articles such as relatively tall glasses having a small supporting base area, does not cause such unsteady support of the article as to cause it to tilt when going around the end of the conveyor. However in order to avoid possibility of an article tilting and falling within the interior of the device a protective shield 107 in the form of a grid work is preferably provided, being suitably bolted to the top plate 104. The grid is curved about the center of rotation of the sprocket wheel and in the normal course of operation the shield is not contacted by the article as it passes around; in the event that the article does tilt such protective grid prevents falling thereof. The conveyor also provides for supporting articles such as plates on edge where they are too large to be received flatwise. The notch 108 formed in the conveyor wire over the looped part 82 provides for receiving the edge of a plate (Fig. 8) and retaining the same in standing position with the upper part of the plate leaning against the central partition throughout the path of travel of the conveyor. While notches may be formed in the wires at either side of the central looped part 82, it is preferred to use the notch 108 for this purpose because being over the sprocket chain, it supports the article most firmly and also the spacing between adjacent notches 108 remains substantially the same when traversing the end zones of the conveyor.

The sprocket wheel 90 located at the end 95 of the device constitutes the driving sprocket. For this purpose a drive motor 110 is mounted

upon the frame and supported from cross struts 11. It carries as a permanent part thereof a speed reducing mechanism 111 to provide for the desired slow speed of operation of the conveyor while making use of a relatively inexpensive and high speed drive motor.

The drive of the conveyor is effected through a device of such character as to provide for the disengagement of the drive in the event of an obstruction occurring in the operation of the conveyor, such device providing for the temporary disengagement of the drive from the sprocket wheel in response to an unusual resistance in the operation of the conveyor followed by the automatic reestablishment of the drive upon release of the obstruction. For this purpose the drive shaft of the speed reducer has a crank arm 113 which carries a drive plate 114 on the end thereof. Mounted on cross brace 11 is a casting 115 forming a bearing which rotatably supports the sprocket shaft 116. The bearing is formed with a yoke portion 117 adjacent its lower part within which is mounted the axially movable worm shaft 118. The shaft meshes in driving engagement with a worm gear 119 on shaft 116, and at one end carries a drive arm 120 extending in line with and adapted to be engaged by the drive plate 114. An adjustable spring means 121 on the opposite end of worm shaft 118 tends to keep the drive arm in engagement with the drive plate but in the event the conveyor jams, worm gear 119 becomes stationary and as the worm shaft continues to rotate, it moves itself axially against the compression of the spring 121 until drive arm 120 is moved clear of drive plate 114. This interrupts the drive and thereafter the motor continues to run with no connection with the conveyor. As soon as the obstruction in the conveyor is released, the spring 121 effects rotation of the worm gear 119 to permit the shaft 118 and its drive arm to reengage in driving relation with plate 114. Hence it is not necessary for the operator to re-set the clutch mechanism, or to do anything other than to relieve such obstruction as may exist in the conveyor operation. A bracket 122 mounted on casting 115 provides additional support for the overhanging central portion of plate 100 and the support or post 46a is also supported thereon and preferably formed integrally therewith.

The sprocket wheel 90 is mounted on the sprocket shaft 116 and is positioned just below the plate assembly 47, 48, 49 as shown in Fig. 8. The ends of such plates are semi-circularly curved about the axis of shaft 116 thereby providing an arcuate slot 125 in continuation with each of the inner longitudinal slots 50. Thus the inner ends 83 of the conveyor loops pass in uninterrupted manner around the end of the device, the thickness of the conveyor wires being such that as shown in Figs. 3 and 5 the inner ends thereof lie substantially in contact while traversing the end zone.

In order to provide for maintaining a proper degree of tension within the sprocket chain to assure proper and uniform operation of the conveyor, means are provided at the opposite end 126 thereof for adjustably maintaining the sprocket chain under a predetermined tension. For this purpose the sprocket wheel 91 at the end 126 of the conveyor is mounted upon supporting means which is adjustable for the purpose of keeping the sprocket chain taut. This means includes a plate 130 having marginal parts 131 which are slidably received within the opposite slots 44 formed between upper and lower angle plates 42 and 43 on either side of the device. The plate 130 is cut out semi-circularly as shown in Fig. 5 so as to lie in the same plane with and just radially beyond conveyor wires 81. Beneath plate 130 is a relatively thin supporting plate 132 upon which the outer ends of the conveyor wires run. Plate 132 is carried by lower plate 133, which extends inwardly beneath the conveyor to approximately the periphery of sprocket wheel 91. Upper plate 134 overlies plate 130 projecting radially inwardly thereof a short distance to form the arcuate guide slot 145 for receiving the ends of the conveyor wires in direct continuation of slots 44 on either side of the device. All of said plates are suitably secured together and inasmuch as plate 130 extends into guide slot 44 while plates 132, 133 and 134 terminate at the lateral edges of members 41, 42 and 43 on each side of the device, it will be clear that the plate structure is supported and guided for sliding movement longitudinally in the fixed frame of the device.

In order to have the sprocket wheel 91 also move with the plate structure, a bracket arm 135 is fastened to the lower plate 133, the bracket having a forked end 136 for adjustable guiding engagement with a groove 137 formed in upright post 46. The bracket likewise carries a fixed stud 138 which forms a bearing for rotatably receiving sprocket wheel 91. Thus it will be clear that in response to movement of the plate structure longitudinally of the machine, the bracket arm 135 will cause corresponding movement of the sprocket wheel to thereby adjust the tension in the sprocket chain. A U-shaped lug 139 is fastened to the fixed cross frame structure 98, and a bolt 140 passes through the plate structure and the lug 139 to provide, upon tightening, for retaining the plate structure in a predetermined position of adjustment.

In order to properly guide the inner ends of the conveyor loops during their passage around the end of the device, means are provided for in effect continuing the inner guide slot which receives the inner ends of the loops throughout the adjustable range of positions of the slidable plate structure. This means comprises a pair of guide plates 142 and 143 which are bolted to top and bottom of the central plate assembly 47, 48, 49 and project longitudinally therebeyond. Both plates 142 and 143 have inwardly turned flanges 144 on their opposite sides, lower plate 47 and upper plate 49 being suitably notched to receive such flanges. Guide plates 142 and 143 extend beyond the ends of plates 47, 48 and 49, and receive slidably within their own outer portion an auxiliary plate structure comprising lower plate 146, intermediate plate 147, and upper plate 148. This auxiliary plate structure is arranged with the intermediate plate of less width than the upper and lower plates to provide a guide slot 149, and the extremity of such plate assembly is curved about the axis of stud 138, as shown in Fig. 5, to provide for receiving the inner end of the conveyor loops as they pass around in their orbit. The auxiliary plate structure is suitably fastened to stud 138 by means of bolt 150, so as to move longitudinally with the sprocket wheel and its support, while being slidably received within the guide plates 142 and 143. From the foregoing it will be apparent that such structure provides a continuous guide for the inner ends of the loops extending from the slot 50 on the one side between the flanges 144, and into the guide slot 149

of the auxiliary plate assembly, around the end of the device, and in the reverse direction on the opposite side to complete the continuous guiding and supporting structure. As the sprocket wheel is adjusted in longitudinal position, the auxiliary plate assembly merely slides in guide plates **142** and **143** to a position of greater or less spacing from the ends of main guide plate assembly **47**, **48** and **49**, the operation of the conveyor being undisturbed by such adjusting movement. As in the case of the opposite end, the guide is not substantially greater in diameter than the thickness of the central wall between the two chambers, the inner ends of the conveyor wires lying practically in contact with each other while encircling the ends to maintain the predetermined desired spacing thereof.

The conveyor constructed in the manner above described has been found to be highly satisfactory in use, and to be particularly desirable in a device of the present character where an effective application of sterilizing rays is desired over the entire area of the article. The use of article supporting means as described herein embodying spaced members substantially circular in cross section and of relatively small diameter, provide for supporting the article with a minimum of obstruction to the light rays. Inasmuch as the light rays are projected toward the article from all directions as a result of the provision of the various reflectors as described above, the utilization of such supporting means provides for support of the articles with substantially a line contact, thereby reducing the area not subject to the light rays to a very minimum.

Further it has been found that in the case where the article is passed through the sterilizing chamber more than once, the shifting in the relative positioning of the supporting wires and the base of the article inherent to the passage of the article around the end zones, serves to expose the surface of the article which may have rested upon a supporting wire. Hence this construction provides for effective overall application of sterilizing rays while assuring an extremely simple construction of conveyor, and one requiring a minimum of usable space.

In order to prevent possible dripping of water from freshly washed glasses into the interior of the device, a drip pan **155** extends along the receiving side of the conveyor and beneath the sprocket chain. This drip pan rests upon bracket supports **135** and **122** carried by posts **46** and **46***a* respectively and is releasably held thereon by clips **157**, the outer end having an upwardly turned flange **158** for fitting beneath the lower flange of channel **41** upon the outer side. A resilient catch member **159** is carried by the drip pan for locking engagement over the flange and is adapted to be manually released from below when it is desired to remove the drip pan.

The extent of the travel of the articles in the sterilizing chamber, and the intensity of the ultra-violet rays produced therein and effective upon the articles is such as to provide for substantially complete sterilization of the articles during one passage through the sterilizer zone. Tests have shown that making use of the three sources of ultra-violet light as illustrated, and with a single passage of the article such as a glass through the sterilizer chamber a practically complete sterilization of all bacteria and germs present thereupon, both inside and outside, is secured. In some cases it is desired to allow the article to continue to circulate through the sterilizing chamber repeatedly until required for use, thereby affording even more assurance of sterility, but such operation is not usually necessary in order to secure a satisfactorily complete sterilization of each article.

In order to prevent unnecessary circulation of the device and to assure the delivery of articles in a sterile condition as required for use, means are provided within the receiving chamber to interrupt the passage of the article after it has made a single passage through the sterilizing chamber and been delivered to discharging position. This means comprises a switch arm **160** extending through a slot **161** in the casing **53** and at an elevation slightly above the level of the conveyor loops so as to be contacted by any article after it has passed through the sterilizing chamber and returned to the discharge position. Arm **160** is mounted upon a vertically extending shaft **162** to the lower end of which is fastened a rectangular block **163** to which an extending cam surface **163***a* is attached. A spring arm **164** supported on bracket **165** which is carried upon the conveyor track bears against the cam surface **163***a* and tends to maintain arm **160** in a position directly transverse to the path of travel of the articles. However shaft **162** may be readily rotated in response to engagement with articles upon the conveyor, against the action of resilient member **164**, with resultant rotation of cam surface **163***a*. The block carries a transversely extending pin **166** covered with an insulating sleeve which engages a finger **167** which actuates a cut-out switch **168**, suitably carried upon bracket **165**. Hence in response to engagement of an article with the cross bar **160**, the cam surface **163***a* is turned and in response to rotation through an angle less than approximately 75° the switch **168** is actuated to a position to open the circuit to the drive motor, thereby stopping the operation of the conveyor, but not interfering with the continued operation of the sterilizing light source. Upon removal of an article from the conveyor for use, the arm **160** returns to normal position under the action of resilient member **164**, and the conveyor is then placed in operation until such time as another article from the sterilizer compartment contacts the arm **160**.

With such arrangement when it is desired to secure continuous operation of the conveyor, arm **160** may be manually turned through an arc of approximately 90°. In such position it is withdrawn from the path of travel of the articles, and is yieldably maintained in such withdrawn position by the cooperation of resilient spring **164** with the cam face **163***a* which urges the switch arm toward the 90° position after it passes about the 75° angle.

Because the ultra-violet rays may be injurious to eyesight, interlock means are provided for assuring that when the protective side cover plates are removed for purposes of cleaning or the like the sterilizing lamps will not accidentally be placed in operation. This means comprises interlocking switch assembly as shown in Figs. 16, 17 and 18. Mounted upon the side frame **10** is an upwardly extending bracket **170** which has a horizontally extending portion **171** extending above the upper flange of frame **10**. A plunger **172** is provided with a portion **173** of semi-circular cross-section, adapted to slide beneath the bracket **171** and above the end of the flange on member **10**. Plunger **172** is formed at its outer end with engaging surface **174** adapted to be con-

tacted by the side panel 22 in the operative position thereof.

A similar bracket 175 is carried by flange 10 upon the opposite side of the device, and a tubular plunger 176 having a notched portion 177 and a bearing surface 178 is arranged for similar cooperative relation with bracket 175. Slidably mounted within the tubular plunger 176 is an operating pin 179 resiliently urged outwardly thereof by compression spring 180. The tubular member 176 is provided with a sleeve portion 181 adapted to receive the inner end of plunger 172, and is likewise formed with a bracket 182 which carries a control switch 183. Switch 183 is provided with an operating lever 184 that extends into a position where it is engaged by either plunger 172 or operating pin 179 and is normally biased to the circuit opening position.

In the operation of this device, and with the parts in the position shown in Fig. 16, the right-hand cover panel 22 is in operative position, but the lefthand cover panel has been removed. Engagement of the surface 178 with the righthand cover panel has therefore moved the entire assembly to the left, the member 174 extending outwardly beyond the normal position of the left-hand cover panel. In this position the switch 183 remains in off position. Should the right-hand cover panel be removed and the lefthand cover panel be returned to normal operative position, the entire assembly would merely be moved to the right, with switch 183 still remaining in open circuit position. In the position shown in Fig. 17 however both the right and the lefthand cover panels are in their normal operative positions, and in such case plunger 172 is moved inwardly and sleeve 181 is likewise moved inwardly. As a result thereof the pin 179 is caused to be pressed against spring 180, thereby causing the switch lever 184 to move into the circuit closed position, to place the sterilizing lamps in operation. As soon as either cover panel is removed spring 180 urges the pin 179 outwardly with respect to sleeve 176, and the switch is thereby actuated to open circuit position.

The circuit diagram for the device is shown in Fig. 20 in which a main switch 185 mounted upon and accessible from the operator's side of the device provides a master control for de-energizing all of the circuits of the device. The automatic conveyor stop switch 169 provides for control of the drive motor independently of the control of the light source and safety switch 183 controlled in accordance with the position of the cover panels provides for interrupting the circuit to the primary of the transformer 186 when either of the cover panels is withdrawn from operative position. Such control thereby de-energizes the tubes 60 which are energized from the high voltage side of the transformer.

The device thus provides a highly satisfactory sterilizing mechanism capable of producing substantially complete sterilization and destruction of any germs or bacteria present upon articles such as glassware, cups, or the like. It is adapted for positioning upon a counter or bar and is arranged to have a minimum depth so as to be receivable upon a shallow counter surface. It provides a highly effective and extremely simple form of conveyor which conveys the articles from a receiving position into a sterilizing chamber, and from the sterilizing chamber back to a discharge position upon the same side of the device as the receiving chamber. The receiving and discharge chamber on the one side is located in close juxtaposition to the sterilizing zone on the opposite side to avoid unnecessary use of space, and the receiving chamber and the operator are adequately protected against undesirable escape of light rays from the sterilizing chamber. The conveyor is such as to provide for conveying the articles in the desired path and requires but a minimum of center space in its operation. Further because it is made up of relatively small gauge wires it offers a very small amount of interference with the surface of the articles, so that a highly effective overall action of the sterilizing rays upon the articles is secured. And with the means provided the conveyor may be made to operate continuously, or only in response to the requirement for use as sterilized articles are removed from the discharge position.

While the forms of apparatus herein described constitute preferred embodiments of the invention, it is to be understood that the invention is not limited to these precise forms of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A sterilizer of the character described comprising an enclosing casing of substantially greater length than depth adapted to be received upon a counter or the like, a conveyor in said casing traversing a path in a substantially horizontal plane longitudinally along one side thereof and in the reverse direction along the opposite side thereof, said casing having an aperture formed in one of the long side walls thereof for receiving articles to be sterilized and for discharging the articles after sterilization in positions adjacent each other on the same side of said casing, means within the casing on the long side opposite said aperture for subjecting the articles to the action of sterilizing rays of light while on said conveyor, and means within the casing interposed between said apertures and said last named means and spaced rearwardly from said aperture for preventing the escape of injurious light rays from said aperture while providing for the insertion of articles upon and removal thereof from said conveyor in front of said preventing means and through said aperture.

2. A sterilizer of the character described comprising an enclosing casing of substantially greater length than depth adapted to be received upon a counter or the like, a receiving chamber on one side of said casing for receiving and discharging articles to be sterilized, said receiving chamber extending longitudinally throughout a major portion of the length of said casing and having a shallow depth of the order of half the depth of said casing, said casing having an aperture formed in one of the long side walls thereof to provide access to said receiving chamber, a sterilizing chamber on the opposite side of said casing and having dimensions similar to those of said receiving chamber, means in said sterilizing chamber for directing sterilizing rays upon articles therein, a relatively narrow longitudinally extending central wall separating said sterilizing chamber from said receiving chamber, a travelling conveyor, means for guiding said conveyor in a continuous path in a substantially horizontal plane longitudinally through said receiving and sterilizing chambers, said central wall being of greater longitudinal extent than said aperture to prevent escape of rays therefrom and terminating short of said casing ends to provide communicating passages between said receiving

chamber and said sterilizing chamber, and in an arcuate path around the ends of said casing, the inner diameter of the path of curvature of said conveyor in said arcuate paths being comparable with the thickness of said narrow wall.

3. In a sterilizer of the character described having a casing, and a sterilizing chamber within said casing, the combination of a continuous travelling conveyor for transporting articles through said chamber including a plurality of elongated wire or rod like supporting members spaced longitudinally from each other in predetermined relation in the direction of travel and extending transversely from one side to the other of said sterilizing chamber, said members being of relatively small cross section to provide for substantially uninterrupted passage of light rays to the articles from beneath the same, guide means along the sides of said casing for receiving the ends of said wire or rod like members and guiding said members in a substantially rectilinear path, guide means at the ends of said casing for guiding said members in arcuate paths joining said rectilinear paths and forming a continuous path lying in a horizontal plane, drive means engaging said members intermediate the ends thereof for advancing said members in said continuous path while maintained in such predetermined relation, and a source of sterilizing light rays for directing sterilizing rays of light upon all surfaces of the articles while on said conveyor from above and below.

4. A sterilizing device of the character described comprising a casing, a receiving and discharging position within said casing, a sterilizing chamber within said casing, means in said chamber for producing sterilizing rays of light, conveyor means operative in a continuous path through said receiving position, said sterilizing chamber, and said discharge position, drive means for operating said conveyor, and means for controlling the operation of said drive means in accordance with the position of articles thereon to effect the termination of said conveyor action after an article has been conveyed through said sterilizing chamber and returned to the discharge position where it may be withdrawn as a sterilized article for use.

5. A sterilizing device of the character described comprising a casing, a receiving and discharging position within said casing, a sterilizing chamber within said casing, means in said chamber for producing sterilizing rays of light, conveyor means operative in a continuous path through said receiving position, said sterilizing chamber, and said discharge position, drive means for operating said conveyor, control means for said drive means, and means adapted to be engaged by an article on said conveyor for actuating said control means to terminate operation of said conveyor after delivery of a sterilized article thereon to said discharging position and for actuating said control means to cause operation of said conveyor when such sterilized article is removed and until delivery of another sterilized article.

6. A sterilizer of the character described comprising an enclosing casing, a receiving position within said casing, a discharge position within said casing, and a sterilizing chamber within said casing, means in said chamber for producing sterilizing light rays, conveyor means entirely within said casing operable continuously through said receiving position, said sterilizing chamber, and said discharging position, said casing having an aperture providing for manual insertion of articles to be sterilized such as dishes, glassware, and the like within said receiving position and providing for manual discharge of articles following sterilization from said discharge position, and means associated with said aperture providing for preventing insertion of an article into said discharge position while providing for substantially free withdrawal of the sterilized article from said position.

7. A sterilizer of the character described comprising an enclosing casing, a receiving position within said casing, a discharge position within sad casing, and a sterilizing chamber within said casing, means in said chamber for producing sterilizing light rays, conveyor means operable in a substantially horizontal plane and continuously through said receiving position, said sterilizing chamber, and said discharge position, said casing having an aperture providing for insertion of articles to be sterilized within said receiving position and providing for discharge of articles following sterilization from said discharge position, drive means for said conveyor, control means actuated in accordance with the delivery of articles following passage through said sterilizing chamber into said discharge position for controlling the operation of said drive means to cause stopping thereof when an article stands in said discharge position, and means providing for withdrawal of articles from said discharge position while preventing insertion of articles into said position.

8. A sterilizer of the character described comprising an enclosing casing, a receiving position within said casing, a discharge position within said casing, and a sterilizing chamber within said casing, means in said chamber for producing sterilizing light rays, conveyor means operable in a substantially horizontal plane and continuously through said receiving position, said sterilizing chamber, and said discharge position, said casing having apertures providing respectively for insertion of articles to be sterilized within said receiving position and providing for discharge of articles following sterilization from said discharge position, drive means for said conveyor, control means actuated in accordance with the delivery of articles following passage through said sterilizing chamber into said discharge position for controlling the operation of said drive means to cause stopping thereof when a sterilized article stands in said discharge position, means providing for withdrawal of articles from said discharge aperture while preventing insertion of articles therethrough, and means providing for inserting articles through said receiving aperture while preventing withdrawal of articles therethrough.

9. A sterilizer of the character described which comprises a generally elongated casing having longitudinally extending side walls and end walls, the side walls being of greater length than the end walls thereby adapting the casing to be placed upon a counter or the like, one of said side walls having an opening therein providing for insertion and removal of articles to be sterilized, a partition lying substantially centrally of said casing and extending longitudinally thereof forming on one side thereof a receiving and discharging chamber and on the other side thereof a sterilizing chamber, said receiving and discharging chamber extending longitudinally throughout a major portion of the length of said casing and having a shallow depth of the order of

half the depth of said casing, said sterilizing chamber having dimensions similar to those of said receiving chamber, said partition being of greater longitudinal extent than said side wall aperture to prevent escape of rays therethrough and terminating short of said casing end walls to provide communicating passages between said receiving and discharging chamber and said sterilizing chamber, conveyor means operable substantially in a horizontal plane through said receiving and discharging chamber, around the ends of said partition, and through said sterilizing chamber, and a source of sterilizing light rays located above and below said conveyor for directing rays of sterilizing light over the entire surface of an article on said conveyor.

10. In a sterilizing device of the character described having a casing, means forming a guide around the entire inner periphery of said casing, a plurality of spaced article supporting members having their ends slidably resting on said guide, means engaging said members inwardly of the ends thereof for driving the same in a continuous path of travel within said casing, said means providing for maintaining said members intermediate their ends in substantially fixed spaced relationship out of contact with each other, said members being thereby spaced to provide access of light rays to the surface of an article supported thereon from beneath the conveyor, and means positioned in a predetermined location within said casing for directing rays of sterilizing light toward articles upon said traveling members from above and below said conveyor to be effective upon substantially the entire exterior surface thereof.

11. In a sterilizing device of the character described having a casing, a sterilizing chamber within the casing, and a source of sterilizing light within said chamber for directing sterilizing light rays upon articles passing therethrough from above and below the same, the combination of guide means forming an inwardly opening slot around the entire inner periphery of said casing, a conveyor operable in said casing in a continuous manner in a horizontal plane including a plurality of spaced article supporting members in the form of wires or rods of relatively small diameter having their outer ends bent rearwardly and being received within said slot to provide for guiding and supporting the same, and means engaging said members inwardly of said ends thereof for driving the same and for maintaining the desired spacing of the wires intermediate their ends, said rearwardly bent ends being effective to avoid objectionable displacement of the outer ends of said members, said members being spaced to provide access of light rays to the surface of an article supported thereon from beneath the conveyor.

12. A sterilizing device of the character described and adapted to be used in the sterilization of dishware, cutlery, and the like which comprises a generally rectangular casing adapted to receive a source of sterilizing light rays having longitudinally extending side walls and end walls, conveyor means operable in said casing in a substantially horizontal plane throughout both its forward and its return run, said coveyor comprising guides mounted in fixed relation within said casing and extending in continuous rectilinear manner along said side walls and in an arcuate manner around said end walls, a plurality of spaced article supporting conveyor members having their ends resting on said guides and being spaced to provide adequate support for articles placed thereon in random position, means for engaging said conveyor members intermediate the ends thereof to retain said members in their predetermined spaced relation with respect to each other, and means for driving said last named means to cause continuous operation of said article supporting members within said casing.

13. A sterilizing device of the character described which comprises a generally rectangular casing having longitudinally extending side walls and end walls apertured for receiving and discharging the articles being sterilized, guides mounted in fixed relation within said casing and extending in continuous manner in a substantially horizontal plane past said aperture and along said side walls and around said end walls, a plurality of spaced article supporting members having their ends resting on said guides and forming a substantially plane surface for receiving articles of varying size placed at random thereon, a driving member positioned intermediate the ends of said article supporting members for effecting driving movement thereof, means for adjusting the tension in said drive member to maintain a predetermined tension therein, and means in said casing for directing sterilizing light rays toward articles supported on said conveyor from above and below the same to be effective upon substantially the entire exterior surface thereof.

14. In a sterilizing device of the character described having a generally rectangular casing with longitudinally extending side walls and end walls, said side walls being of greater length than the end walls adapting the casing to be placed upon a counter or the like and certain of said walls being apertured for the passage of articles to be sterilized, conveyor means operable in said casing in a substantially horizontal plane including guides mounted in fixed relation within said casing and extending in continuous manner along said side walls and said end walls, means for mounting a portion of said guide for movement with respect to the remainder of the guide, a sprocket wheel adjacent either end of said casing, a sprocket chain movable over said sprocket wheels through said casing inwardly of said guides, a plurality of spaced articles supporting members carried by said chain and having their ends resting on said guides, means for movably supporting one of said sprocket wheels to provide for adjustment thereof together with said adjustable portion of said guide to thereby provide for maintaining a desired tension in said chain, and means in said casing for directing sterilizing light rays toward articles supported on said conveyor from above and below the same to be effective upon substantially the entire exterior surface thereof.

15. A sterilizer of the character described comprising a main frame, end panels fastened to said frame, a top member extending from one end panel to the other, a pair of side panels having means for engaging said top member to be removably supported thereon in enclosing relation, a partition located substantially centrally between said side panels and dividing the interior of said sterilizer into an article handling position at one side and a sterilizing compartment at the other side thereof and in substantially the same horizontal plane therewith, the side panel adjacent said article handling position having an aperture therethrough to provide for receiving and removal of articles, reflectors positioned on the wall of said partition toward said sterilizing

compartment and on the inner wall of said side panel which encloses said sterilizing compartment, means for conveying articles from said article handling position through said sterilizing chamber and back to said article handling position for discharging therefrom, and a source of sterilizing light rays in said sterilizing chamber for supplying rays of sterilizing light to be effective in conjunction with said reflectors upon all parts of an article supported on said conveying means.

16. A sterilizing device of the character described comprising a casing, a receiving and discharging position within said casing, a sterilizing chamber within said casing, means in said chamber for producing sterilizing rays of light, conveyor means operative in a continuous path through said receiving position, said sterilizing chamber, and said discharge position, drive means for operating said conveyor, and means for controlling the operation of said drive means independently of said light producing means in accordance with the position of articles threon to effect the termination of said conveyor action while the operation of said light producing means continues uninterrupted after an article has been conveyed through said sterilizing chamber and returned to the discharge position where it may be withdrawn as a sterilized article for use.

17. A sterilizer of the character described comprising an enclosing casing, a receiving position within said casing, a discharge position within said casing, and a sterilizing chamber within said casing, means in said chamber for producing sterilizing light rays, conveyor means within said casing operable in a substantially horizontal plane and continuously through said receiving position, said sterilizing chamber, and said discharge position for receiving articles to be sterilized in random position thereon, said casing having apertures providing respectively for lateral insertion of articles to be sterilized within said receiving position and providing for lateral discharge of articles following sterilization from said discharge position, drive means for said conveyor, means providing for withdrawal of articles from said discharge aperture while preventing insertion of articles therethrough, and means providing for inserting articles through said receiving aperture while preventing withdrawal of articles therethrough.

18. A sterilizer of the character described which comprises a casing, a sterilizing chamber within said casing, means in said sterilizing chamber for generating sterilizing light rays, said casing having a removable wall portion providing access thereto and preventing escape of sterilizing light rays therefrom when in operative position, a conveyor for transporting articles to be sterilized from a receiving position through said sterilizing chamber and to a discharge position, said casing having a permanently open aperture formed therein in position to provide access to said receiving and discharge positions, means within said casing for preventing escape of injurious light rays from said sterilizing chamber through said permanently open aperture, and means effective upon the removal of said removable wall portion from operative position to interrupt the generation of said light rays.

19. A sterilizer of the character described which comprises removable oppositely positioned walls forming a casing, means in said casing for generating sterilizing light rays to be effective upon articles therein, a receiving station for articles to be sterilized, means in said casing for receiving articles at said receiving station and conveying them through the effective area of said light rays for sterilization thereby, means for shielding said receiving station and cooperating with said removable walls to prevent escape of injurious light rays from said casing, and means effective upon removal of either of said removable walls from operative position to interrupt the generation of said light rays, said last named means comprising a first member adapted to engage one of said removable walls and to be moved inwardly thereby when said wall is placed in enclosing position, a second member adapted to engage the other of said removable walls and to be moved inwardly thereby when said last named wall is placed in enclosing position, switch means associated with said first and second members and controlling said light generating means, and operative connections between said switch means and said members to move said switch means to on position when both said removable walls are in place and to move said switch means to off position when either or both of said walls are removed from operative position.

20. A sterilizer of the character described adapted to receive articles of dishware, cutlery and the like of varying size and in random positioning thereon and to effect the sterilization thereof comprising a casing, a sterilizing chamber within said casing, guide means extending around the inner periphery of said casing, a plurality of spaced article supporting members adapted to receive thereon in random positioning the articles to be sterilized and having their ends extending into said guide means to be guided and supported thereby, said members being relatively small in width to offer a minimum of obstruction to the action of sterilizing light rays, means for driving said members in a continuous path of movement which includes passage through said sterilizing chamber, and means in said chamber for directing sterilizing light rays upon the articles on said members from above and below the same to effectively subject substantially the entire surface of the article to a sterilizing action.

DAVID A. MEEKER.
DE LOSS D. WALLACE.

CERTIFICATE OF CORRECTION.

Patent No. 2,275,788. March 10, 1942.

DAVID A. MEEKER, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 1, first column, line 15, for "lke" read --like--; page 3, first column, line 29, for "of" after "area" read --or--; page 7, second column, line 71, claim 2, strike out the words "said central wall being of greater longitudinal extent than said aperture to prevent escape of rays therefrom and terminating short of said casing ends to provide communicating passages between said receiving chamber and said sterilizing chamber," and insert the same after "chamber," and before "a" on page 7, second column, line 67, same claim 2; page 8, second column, line 14, for "sad" read --said--; page 10, first column, line 6, claim 15, for "discharging" read --discharge--; line 23, claim 16, for "threon" read --thereon--; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 5th day of May, A. D. 1942.

Henry Van Arsdale,
Acting Commissioner of Patents.

(Seal)