Sept. 16, 1924.

R. E. KLETT

1,508,799

STERILIZER

Filed Sept. 23, 1922

2 Sheets-Sheet 1

Fig 3

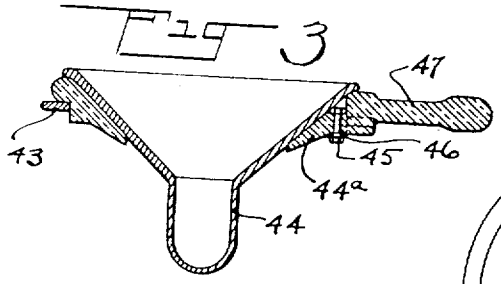


Fig 4

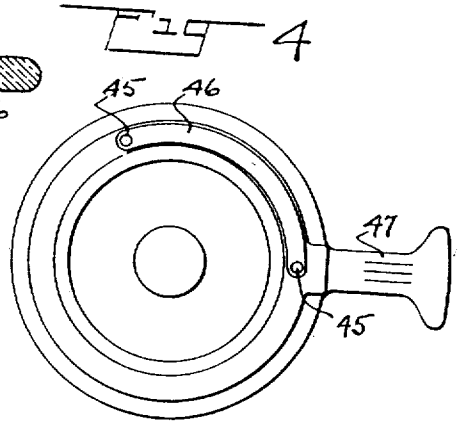


Fig 1

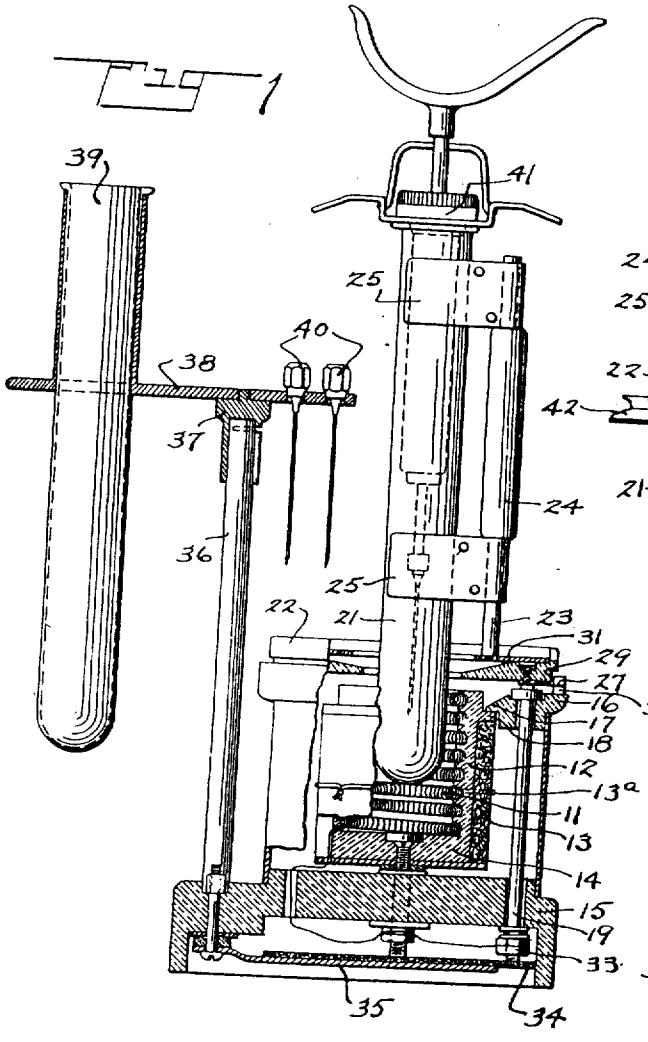
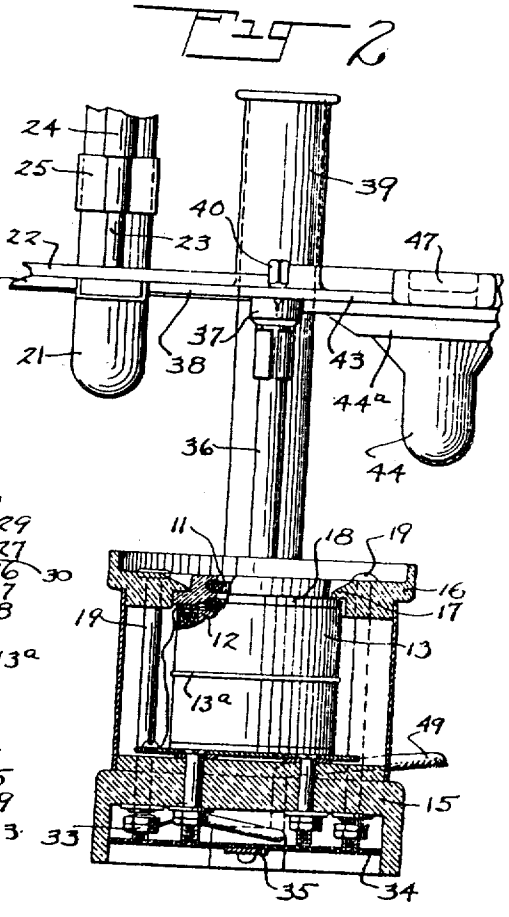


Fig 2



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R. E. KLETT

STERILIZER

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Fig 6

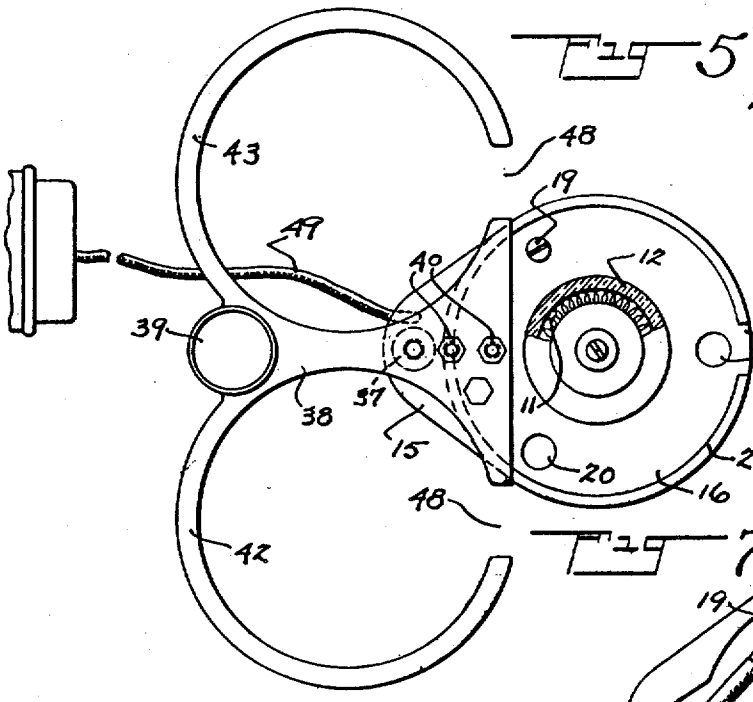


Fig 5

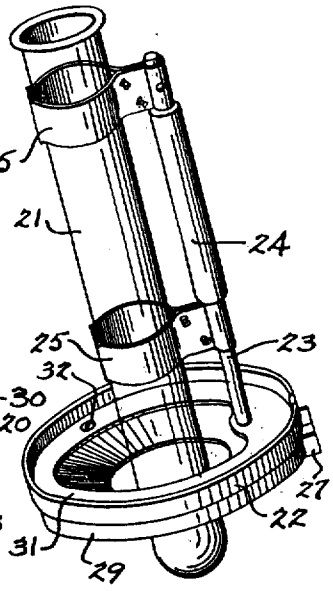


Fig 7

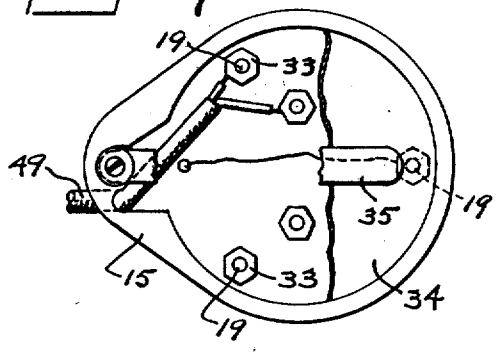


Fig 8

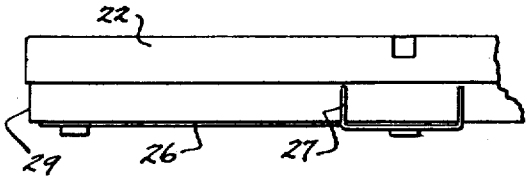


Fig 9

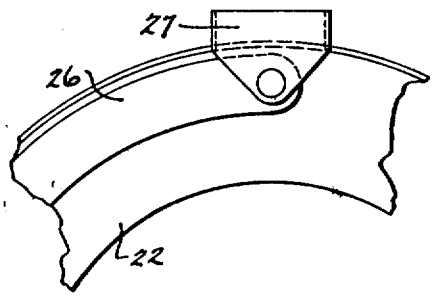
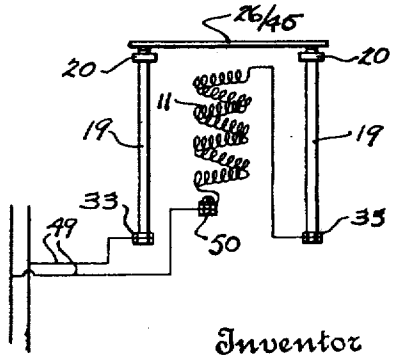


Fig 10



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Patented Sept. 16, 1924. 1,508,799

UNITED STATES PATENT OFFICE.

ROBERT E. KLETT, OF RIDGEFIELD PARK, NEW JERSEY, ASSIGNOR TO KLETT MANUFACTURING COMPANY, INC., A CORPORATION OF NEW YORK.

STERILIZER.

Application filed September 23, 1922. Serial No. 590,003.

To all whom it may concern:

Be it known that I, ROBERT E. KLETT, citizen of the United States, and resident of Ridgefield Park, in the county of Bergen and State of New Jersey, have invented certain new and useful Improvements in Sterilizers, of which the following is a specification.

This invention relates to electric heating devices and more especially to sterilizers such as used by doctors and dentists for the sterilization of small instruments, such as hypodermic syringes, and the heating of small quantities of medicines and other substances. One object is to increase the convenience of operating such a device through doing away with the usual control switch by making the switch controlling the heater automatic in operation as the object to be heated is placed on or taken off the heater. Another object resides in the provision of a compact arrangement of a heater in conjunction with and adjacent a rack for holding several of the instruments or materials most frequently used.

The usual sterilizing devices of this type are objectionable because of the waste of time necessary to turn off the switch when the heating is completed or else the waste of current from allowing the heat to continue after the heated object has been removed. This invention removes these difficulties by the provision of an automatic switch which closes the heater circuit as soon as the object is placed in cooperation with the heater and which opens when that object is removed. Another objection has been the difficulty in telling from a distance whether or not the current is on. The doctor, while busy with a patient, may want to be sure that his assistant has stopped the heating of some material in preparation and be sure the current is off. With this invention a mere glance at the heater will tell if the current is on or off and this is possible without the trouble of looking at a switch to see whether it is in its proper position because the object to be heated acts as a signal to tell when the current is on and when not.

For purposes of illustration this invention is shown embodied in a device having a heating coil substantially vertically disposed and open at the top in order that the object to be heated may be placed within the coil. To prevent needless loss of heat the coil is well lagged on the sides and bottom. A support for the heated object is placed above and around the heater. Instead of the usual switch, a pair of contacts are located adjacent this support and are adapted to be bridged by a conductor attached to the heated object or its holder. Removing the heated object automatically breaks the circuit while placing it on the heater simultaneously closes the supply circuit without the need of turning a separate switch. An enclosing casing surrounding the coil gives the heater a neatly finished appearance. Mounted on the supporting base of the heater and to one side is a rack adapted to receive a plurality of the objects to be heated, such as test tubes, hypodermic syringes and small liquid containers for the anesthetics and other medicines required to be heated.

Referring to the drawings, Fig. 1 is a side view partly in section of the improved heater,

Fig. 2 is a front view of the same device and also has parts broken away,

Fig. 3 is a section of one of the liquid containers or objects to be heated,

Fig. 4 shows a bottom view of the object shown in Fig. 3,

Fig. 5 is a perspective of another of the objects to be heated which is shown in Fig. 1 as being in cooperation with the heater,

Fig. 6 is a top plan view of the heater with parts broken away,

Fig. 7 is a bottom view of the base member of the heater,

Fig. 8 is an enlarged side view of a portion of the holder shown in Fig. 5,

Fig. 9 is a bottom view of a device shown in Fig. 8, and

Fig. 10 is a conventional representation of the electric circuit.

Referring to Fig. 1, the numeral 11 indicates a coil of wire constituting the heating element which is supported by member 12 of heat and electric insulating material. A wrapper 13 of asbestos or other appropriate lagging may surround the member 12 and be held in place by means of a binding wire 13^a or otherwise. The bottom of the heating coil is closed by member 14 of the same general material as the member 12 and is supported on the base 15 of the apparatus. Surrounding the upper portion of the member 12 is the ledge 18 in cooperation

with a corresponding ledge or flange 17 on the ring member 16 which is held in position by means of bolts 19. Two of the bolts 19 are headed at 20 to provide contacts adapted to be bridged by the conductor 26 secured to the underside of the base 22 of the holder for the test tube 21 or other object to be heated. Secured to the base 22 of the holder by screws 32 or other fastening means is a metal plate 31. Fixed to the plate 31 and projecting above it is the supporting column 23 provided with a convenient handle 24 preferably of heat insulating material so that the holder may be lifted even though the column 23 become hot. Yieldable clips 25 adapted to retain a test tube are also secured to the column 23. The conductor 26 for bridging the contacts 20 is secured to the underside of the base 22 of the holder and is shown clearly in Figs. 8 and 9 as being provided with a projecting lug 27 adapted to fit in the cutaway portion 30 of the ring shaped member 16 and thus insure the contacts 20 being in cooperation with the conductor 26. The ring shaped member 16 is shown in Figs. 1 and 6 as being provided with an upstanding ledge 28 within which the cutaway portion 29 of the base of the holder is adapted to be received.

The underside of the heater base 15 may be recessed and two of the bolts 19 may be provided with additional nuts serving to clamp wiring leads. An insulating disc 34 may enclose the recessed bottom portion of the base member 15 and is held in position by a metal disc 35 in the manner illustrated in Fig. 1. Also secured to the base member 15 is a post 36 cooperating at the top with a socket 37 having yieldable sides which in turn supports the plate 38 and enables the plate to be given a desired angular adjustment. The plate 38 is shown as adapted to receive a number of instruments or other objects to be heated, such, for example as needles 40 and the test tube 39 in which a syringe 41 may be placed. The sides of the plate 38 are shaped to form annular ledges 42 and 43 on which the base 22 of the holders are adapted to rest. By providing the gaps 48 in the ledges 42 and 43, the base 22 of a holder may rest upon the flange formed by its reduced lower portion 29 and allow the guide lugs 27 to be positioned within the gaps 48.

Another form of object to be heated is shown in Figs. 3 and 4 as comprising the dish 44 of porcelain or other antiseptic material for containing the anesthetic or other desired liquid. A ring shaped member 44ª is adapted to support the receptacle 44 and is provided with a handle 47, in place of the guide lug 27. From Fig. 4 it will be seen that the bottom of the member 44ª is also provided with contacts 45 and conductor 46 adapted to bridge the previously described contacts 20. From Fig. 10 it may be seen that the electric circuit is as follows. From one of the incoming leads 49 up through one of the bolts and thence through the bridging conductor 26 or 45 as the case may be, down through the other contact bolt 19 through the heating coil 11 to the binding post 50 and out the other of the supply leads.

In operation the heater is particularly simple because no usual switch is necessary to turn on or off the current, but the controlling switch is automatic in action and is formed by the bridging conductor 26, secured to the under side of the holder, being placed across the contacts 20 as the object to be heated is moved into position. If for example it is desired to sterilize a syringe, the test tube 21 may be partially filled with water and the holder and tube moved from one of the ledges 42 or 43 into the position shown in Fig. 1 when the circuit is automatically closed and the heater started. At the end of the sterilizing process, instead of stopping to turn a switch, the holder and syringe may be removed by grasping the handle 24 and placing the holder back on one of the ledges 42 and 43 and thus automatically opening the circuit of the heater to save electric current as soon as the holder is removed from its position shown in Fig. 1. The same convenience of operation pertains with regard to the holder 44.

Among the advantages of the present invention may be mentioned its convenience of operation and saving in time required to turn the switch or the saving in cost of energy through forgetting to turn off the current. The heater is of durable construction and made in a neat and compact arrangement to economize space. The instrument receiving plate 38 located adjacent the heater is another item enhancing the convenience of operation of the heater. If desired an enclosing casing 51 of metal or other suitable material may surround the heater. Having the heating object of general cylindrical shape and adapted to extend down into the heating coil enables the heat to be transmitted efficiently, while the use of heat insulating material surrounding the coil on three sides prevents needless radiation losses. It will thus be seen that the object to be heated, whether it be the test tube and syringe or the small liquid container, is adapted to function as a signal indicating whether or not the current is on. A practitioner need only give a glance at the sterilizer when he can tell whether his assistant has removed the heated object from the sterilizer and will in that way be sure that the circuit controlling switch is as he wants it. The use of the rack secured adjacent the heater furnishes a compact arrangement for

holding a number of instruments or materials conveniently close to the sterilizer.

While this invention has been illustrated in a small sterilizer for doctors and dentists, it will be understood that it may be embodied in other forms of heaters and is not therefore limited to such small sterilizers of the class illustrated.

I claim:

1. The combination with an electric heater, of an object to be heated thereby, a contact adjacent the heater adapted to support said object, and a conductor supporting said object on said contact, held in engagement with said contact under the weight of said object, secured to the object, and removable from the heater therewith.

2. The combination with an electric heater, of an object to be heated thereby, a pair of contacts adjacent the heater to support said object, a conductor supporting said object on said contacts, held in engagement with said contacts under the weight of said object secured to the object and removable from the heater therewith, and guiding means for directing movement of said object into the heater and for positioning the conductor for engagement with said contacts.

3. The combination with an electric heater of an object to be heated thereby, a pair of contacts non-yieldably fixed adjacent the heater, adapted to support said object, and a conductor supporting said object on said contacts, held in engagement with said contacts under the weight of said object to close the heater circuit, secured to the object and removable from the heater therewith.

4. The combination with an electric heater of an object to be heated thereby, a holder for the object while on the heater, a pair of contacts adjacent the heater adapted to support said holder and object, a conductor on said holder supporting the same on said contacts to close the heater circuit and removable with said holder from said heater.

5. An electric heater comprising in combination a helical heating coil with its axis vertical, a heat and electric insulating supporting member enclosing said coil on the sides and bottom, an object to be heated adapted to be inserted within the coil, a pair of contacts outside the coil, a conductor adapted to bridge the contacts and close an electric circuit through the coil, a support for the object to be heated to which said conductor is secured, and means for retaining said support in position with the conductor closing said circuit.

6. The combination with a vertically disposed heating coil, of a heat insulating support surrounding said heating coil on the sides and bottom, an enclosing casing spaced from and surrounding said support, a base member to which said support and casing are secured, a container adapted to be placed within the coil, a container support provided with a handle of heat insulating material, a pair of contacts between the coil support and enclosing casing, a conductor secured to the container support and adapted to bridge said contacts and control said heater, a supporting stand secured to said base member and adapted to receive said container and its support when removed from the heater.

7. An electric sterilizer for hypodermic needles and the like comprising a heating coil, heat insulating material surrounding said coil on the sides and bottom, the coil being open on top to permit the insertion of the object to be heated, a support surrounding said coil and adapted to hold said object while being heated, and a supporting rack secured adjacent the heater and adapted to contain said object when removed from the heater.

8. An electric sterilizer comprising a heating coil lagged on the sides and bottom and open on the top for the insertion of an object to be heated, a support surrounding said coil and provided with guide means adapted to center the heated object with respect to the coil, and a supporting stand connected with and adjacent the heater for carrying such object when removed from the heater.

Signed at New York city in the county of New York and State of New York this 19th day of September A. D. 1922.

ROBERT E. KLETT.