Oct. 7, 1930. G. H. SCHWEDLER 1,777,862

STERILIZING APPARATUS

Filed June 13, 1929

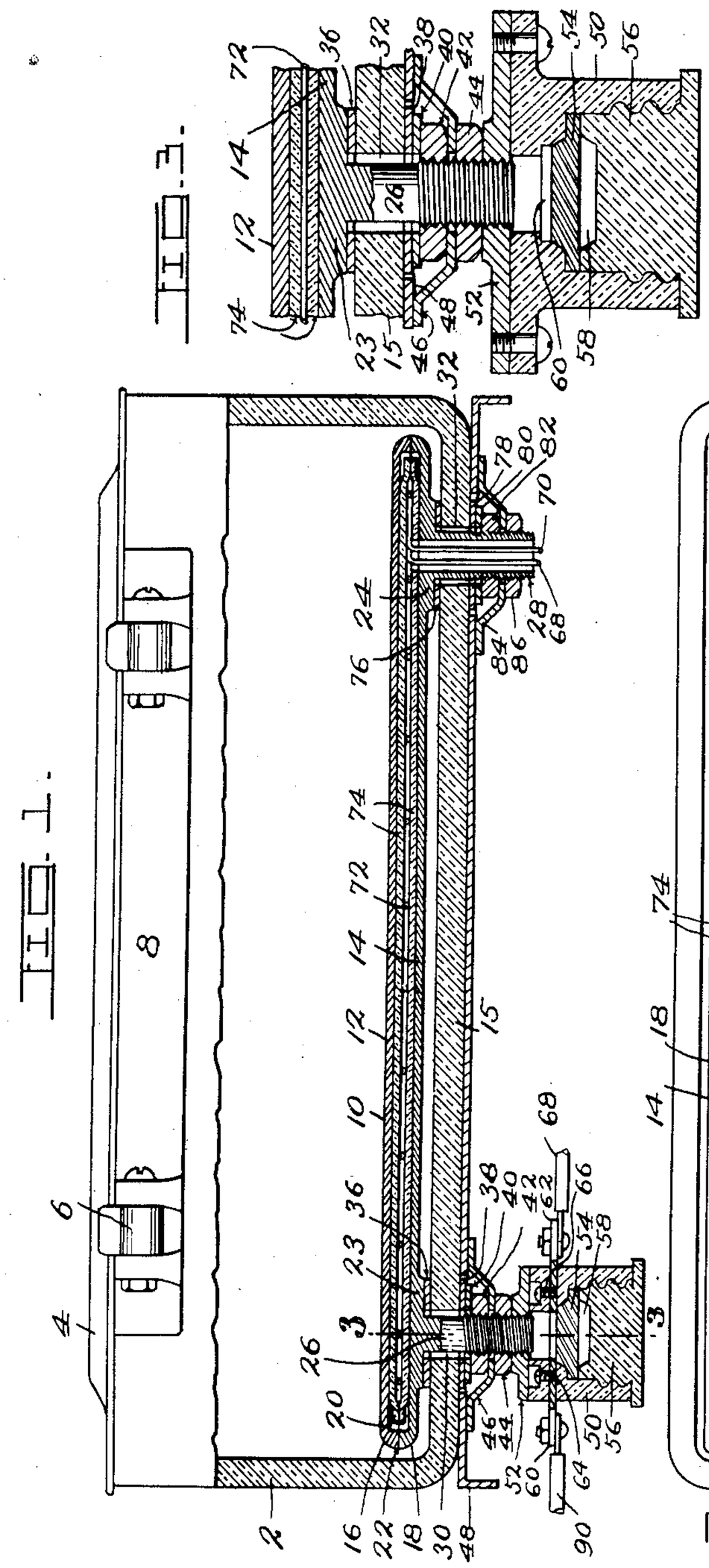

FIG. 1.

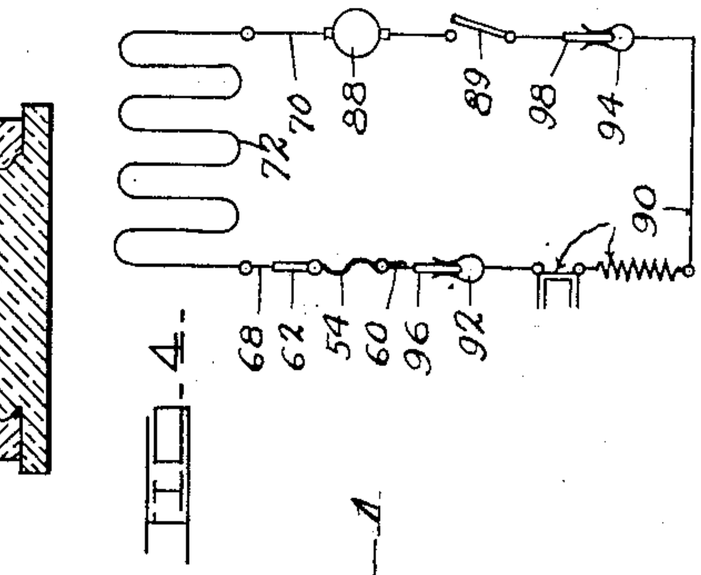

FIG. 3.

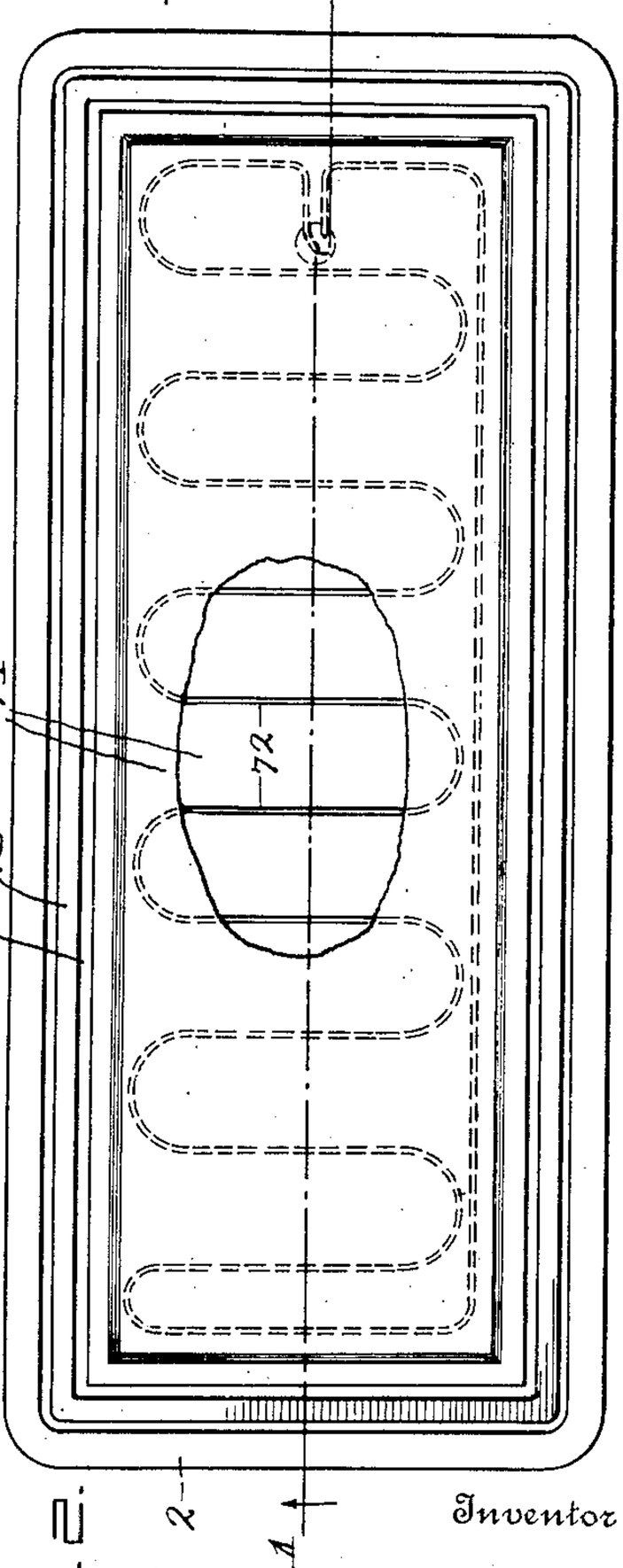

FIG. 4.



FIG. 2.

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# UNITED STATES PATENT OFFICE

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## STERILIZING APPARATUS

Application filed June 13, 1929. Serial No. 370,643.

My invention relates to apparatus for sterilizing dental and other instruments and an important feature resides in a heater or radiator which is submerged in the sterilizing medium instead of being located beneath the sterilizing receptacle as heretofore where a large percentage of the heat was wasted. By submerging the radiator so that it is entirely surrounded by the sterilizing medium it is apparent that all of the heat generated will be utilized for raising the temperature of the sterilizing medium to the desired degree in much less time than when a large percentage of the heat is wasted as above pointed out, and hence a considerable saving is effected not only in time but also in the electrical current which is utilized in supplying the heat.

Other features of the invention reside in a fusible member and its holder, the fusible member being so located with respect to the radiator that in the event the latter becomes overheated the fusible member will melt and interrupt the circuit through which the electrical current flows, while the holder is shaped to mold the melted fusible member into its original form so that it may be instantly used on congealing and thus avoid the necessity of obtaining another fusible member and being without the use of the sterilizer in the meantime. The fusible member may either be employed as a part of the electrical circuit or as a lock for holding a self-opening switch in the circuit in closed position until the fusible member is melted by overheating of the radiator, as above pointed out.

Other features will hereinafter appear and in order that the invention may be fully understood, reference will now be had to the accompanying drawing, in which:

Fig. 1 is a broken side elevation partly in section on line 1—1 of the sterilizing apparatus.

Fig. 2 is a plan view of the sterilizing apparatus with the lid of the receptacle removed.

Fig. 3 is an enlarged section on line 3—3 of Fig. 1.

Fig. 4 is a diagram of the electrical circuit.

Referring in detail to the different parts, 2 designates a receptacle which consists preferably of glass capable of withstanding a high temperature without injury. 4 designates a lid for closing the upper portion of the receptacle and which is mounted upon hinges 6 secured to a bar 8 bolted or otherwise fixed to the upper portion of the receptacle 2.

10 designates a heater or radiator which constitutes an important feature of the invention. Said radiator is preferably arranged wholly within the receptacle 2 so that the sterilizing medium such as water may surround said radiator. The radiator 10 may be made in different forms, but for the purpose of illustration I have shown it consisting of two flat plates 12 and 14 of a size to approximately cover the bottom 16 of the receptacle. The plates 12 and 14 have shallow marginal flanges 16 and 18, respectively, which abut each other to leave an intervening chamber 20 between the flat portions of said plates 12 and 14. The joint 22 between the abutting flanges 16 and 18 is hermetically sealed with a suitable substance, such for instance, as white lead to prevent the entrance of the sterilizing fluid into the chamber 20.

The lower plate 14 of the radiator 10 is provided at its under side near its ends with bosses 23 and 24 from which legs 26 and 28 extend through openings 30 and 32 formed in the bottom of the receptacle 2.

The sterilizing medium is prevented from running out through the opening 30 by means of a gasket 36 interposed between the bottom of the receptacle 2 and the boss 23. Further security against leakage is also provided by a gasket 38 interposed between the bottom of the receptacle 2 and a washer 40. A nut 42 is threaded upon the leg 26 for causing the boss 23 and the washer 40 to force the gaskets 36 and 38, respectively, firmly against the adjacent surfaces of the receptacle bottom 16. The leg 26 is also provided with a nut 44 which coacts with a cup-shaped washer 46 in holding the receptacle 2 firmly upon a base 48.

50 designates a fuse holder consisting of porcelain or other suitable insulating material. Said holder 50 is provided with a metal cap 52 which is threaded upon the lower end of the leg 26 beneath which a fuse 54 is spaced a short distance and secured in the holder 50

by means of a removable plug 56, which may consist of the same material as the holder 50. The plug 56 is provided at its upper end with a cavity 58 of the same shape and size as the upper central portion of the fuse 54, so that should the latter become melted a portion thereof will flow into said cavity 58 and be molded into its original shape so that the fuse can be instantly used after congealing for closing the circuit between terminals 60 and 62 secured in the holder 50 by suitable means such as screws 64 and 66, respectively.

The leg 28 of the radiator 10 is hollow so that circuit wires 68 and 70 may extend therethrough and be connected to an electrical heating element 72 which is arranged in the chamber 20 and interposed between two sheets of mica or other insulating material 74 for preventing the radiator 10 from becoming charged with electricity. The hollow leg 28 is provided with gaskets 76 and 78, a washer 80, and a nut 82 for sealing the opening 22 against leakage. A cup-shaped washer 84 and a nut 86 are also applied to the hollow leg 28 to coact with the nut 44 and the washer 46 in securing the receptacle 2 to the base 48.

The circuit wire 68 connects with the terminal 62, while the wire 70 connects with one side of a suitable source of electrical energy such as a generator 88 to the opposite side of which a manual switch 89 is connected.

90 designates a thermostatic circuit breaker which is preferably of the type disclosed by the thermostatic device disclosed by my copending application filed December 15, 1928, Serial No. 326,223, so that it may be set to cut off the current to the heating element 72 within any predetermined time. Said thermostatic circuit breaker 90 has female connectors 92 and 94 for detachable connection with male connectors 96 and 98 which are connected to the terminal 60 and the switch 89, respectively.

In practice, the instruments to be sterilized may be placed directly upon the radiator 10, or in a wire basket which is then set upon said radiator. The receptacle 2 is then supplied with a sterilizing fluid to the desired depth after which the circuit is closed with the switch 89 so that current may flow through the thermostatic circuit breaker 90, terminal 60, fuse 54, terminal 62, wire 68, the heating element 72, and back to the source of energy through the wire 70. At the proper time the circuit is interrupted by the thermostatic device 90 which was previously set to permit sufficient time to elapse between the turning on and the cutting off of the current to allow the sterilizing fluid to boil.

Should the attendant fail to put an adequate supply of sterilizing fluid in the receptacle 2 so that said fluid boils away before the circuit is interrupted by the thermostatic device 90, excessive heat caused by the resultant abnormal rise in temperature of the radiator 10 will be transmitted by the leg 26 to the fusible member 54, causing the latter to fuse so that a portion thereof will flow into the cavity 58 and thereby break the circuit between the terminals 60 and 62, thus averting damage to the different parts from overheating.

From the foregoing description it is apparent that by submerging the radiator 10 in the sterilizing medium that all of the heat thrown off by said radiator will be utilized for heating said medium and by equipping the circuit with the fuse 54 and the thermostatic device 90, two safety means are provided for preventing damage to the different parts from overheating, and while I have shown one form of the invention I reserve all rights to such other forms and modifications as properly fall within the spirit and scope of the invention as claimed.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:

1. In a sterilizer, a receptacle adapted to hold a sterilizing fluid, a radiator arranged within and spaced above the bottom of said receptacle, a hollow leg extending from said radiator through a hole in the bottom of the receptacle, means coacting with the leg in sealing said hole around said leg, a heating element arranged in the radiator, an electric circuit extending through the hollow leg and connected to said heating element, a fuse in said circuit, a holder enclosing said fuse, a heat conducting leg extending from the radiator through an opening in the bottom of the receptacle and supporting said fuse holder, and means coacting with the heat conducting leg in sealing the opening around said leg.

2. In a sterilizer, an electric circuit including thermal means for heating said sterilizer, a fusible member in said circuit and provided with a raised central portion, and a holder for recasting said fuse including a removable plug having a cavity of the same shape and size as the raised portion of the fuse.

In testimony whereof I affix my signature.

GUSTAVE H. SCHWEDLER.