

Oct. 6, 1959

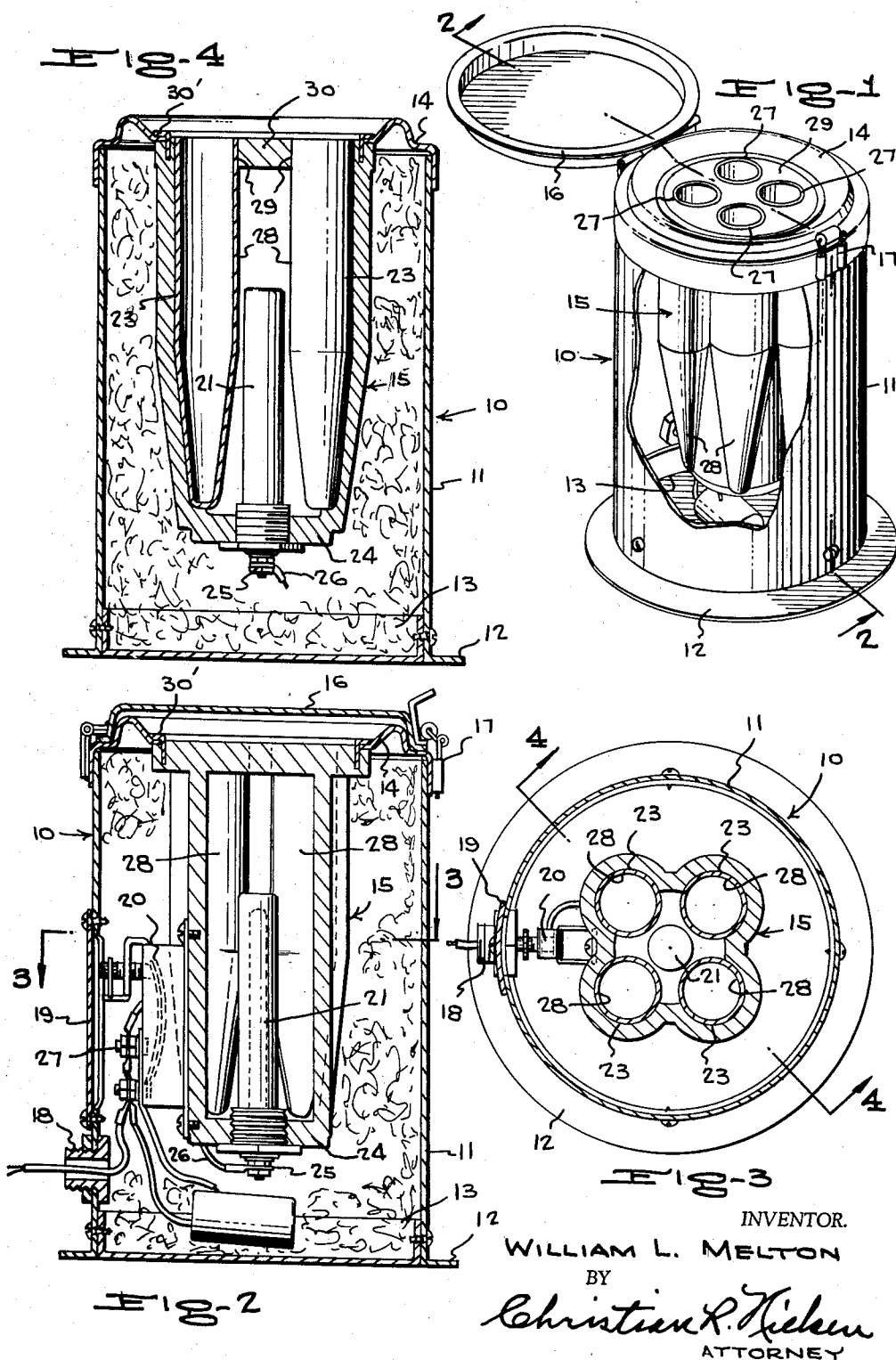
W. L. MELTON

2,907,861

ELECTRICAL OIL HEATING DEVICE

Filed Nov. 25, 1957

2 Sheets-Sheet 1



Oct. 6, 1959

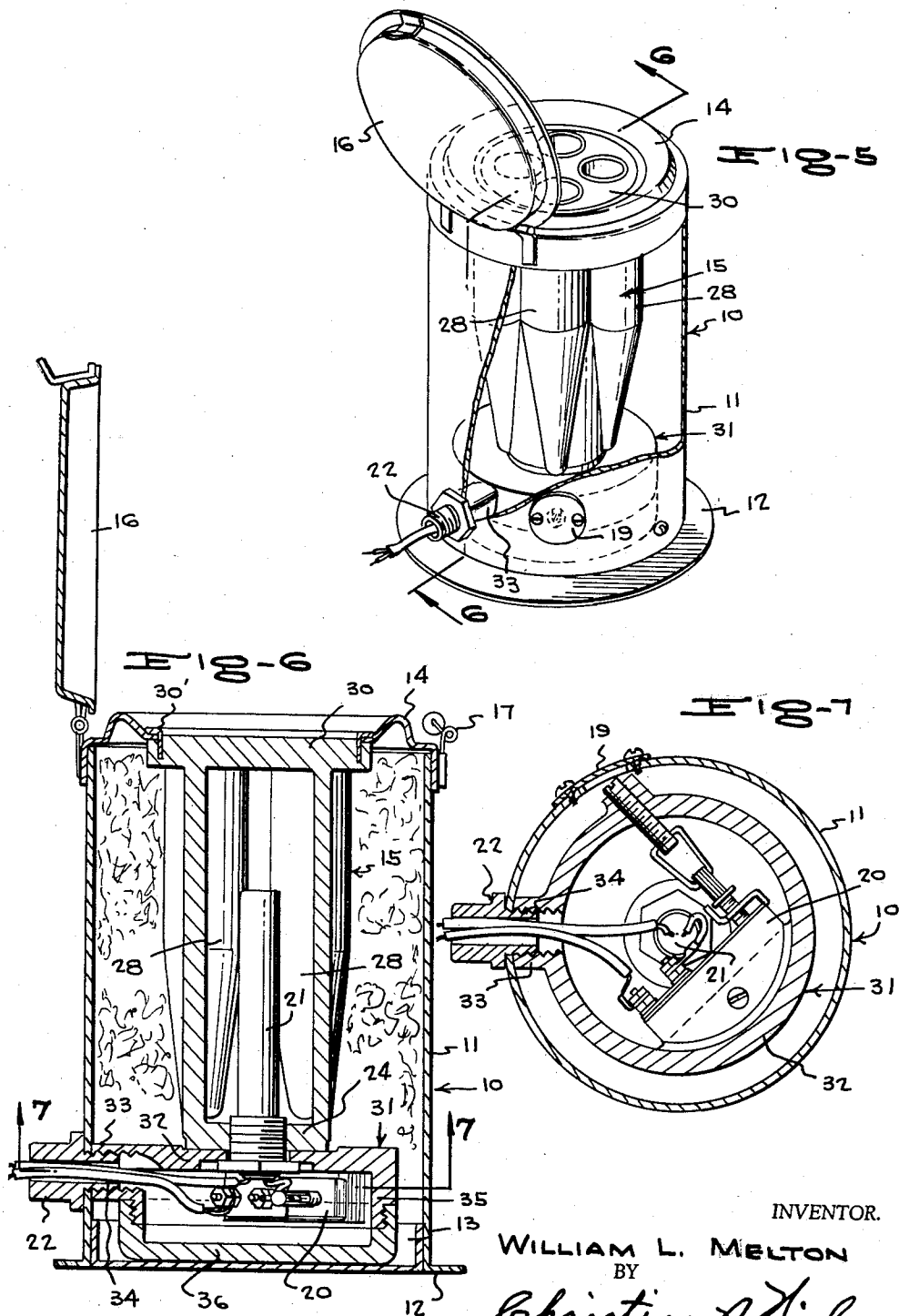
W. L. MELTON

2,907,861

ELECTRICAL OIL HEATING DEVICE

Filed Nov. 25, 1957

2 Sheets-Sheet 2



INVENTOR.

WILLIAM L. MELTON

BY

Christian D. Ficken
ATTORNEY

1

2,907,861

ELECTRICAL OIL HEATING DEVICE

William L. Melton, Selman City, Tex.

Application November 25, 1957, Serial No. 698,528

2 Claims. (Cl. 219—43)

This invention relates to devices for heating oil and particularly those which are used in the field for heating crude oil from wells, field or storage tanks and it consists in the constructions, arrangements and combinations herein described and claimed.

It is the cardinal object of the invention to provide a retort device of the type as shown and described in my prior Patent #2,299,401, issued October 20, 1942, but embodying a heater unit which embodies a heater element which is centrally and vertically located with respect to a plurality of test tube holding chambers to more effectively and evenly heat oil contained in test tubes supported in the heater unit of the device.

It is also an important object of the invention to provide an oil heating device in which the main body of the unit is formed from a metal of high coefficient of heat conductivity, such as an aluminum alloy, which in conjunction with copper crucibles for support of test tubes for containing oil, insures a rapid and even heating of the oil.

A further object of the invention is the provision of a heater unit which will be of rugged construction and free from liability of damage incident to rough usage in traveling and in one form of which may be constructed so as to be explosive proof.

Additional objects, advantages and features of invention will be apparent from the following description, considered in conjunction with the accompanying drawings, wherein,

Figure 1 is a perspective view of the heating unit a portion of the housing being broken away and the closure for the top thereof in open position.

Figure 2 is a vertical section of the unit, taken on the line 2—2 of Figure 1, but with the closure in operative position.

Figure 3 is a cross section on the line 3—3 of Figure 2.

Figure 4 is a vertical section on the line 4—4 of Figure 3, the closure cover being removed.

Figure 5 is a perspective view of a modified form of heating unit embodying structure rendering the device explosive proof.

Figure 6 is a vertical section taken on the line 6—6 of Figure 5, and

Figure 7 is a cross section on the line 7—7 of Figure 6.

The heater unit 10 illustrated in all figures comprises a sheet metal housing 11, having an annular flange 12 at the bottom thereof, which together with a removable bottom closure plate 13 affords a stable support for the unit. The top wall of the housing 11 has an annular collar 14 for support of the heating unit 15, as will be described hereinafter. The top wall of the housing also has a hinged closure 16 which may be held in closed position by means of a suitable catch 17, and as clearly shown in Figure 2, the closure 16 lies spaced above the annular collar 14 and the open ends of the crucibles, accommodating release of fumes which may be developed from oil being heated.

2

In the form shown in Figures 1 to 4, the housing 11 includes a current conductor outlet 18 and a removable plate 19 permitting adjustment of a thermostatic switch 20 to regulate the temperature of the heating coil. In the form shown in Figures 5 to 7, an outlet 22 is provided of somewhat different construction from the outlet 18, as will be presently described. In this form a removable closure plate 19 is employed for adjustment of the thermostatic switch 20.

In both forms of the heaters 10, the heater units are of like construction and comprises a retort body formed of a metal of high coefficient of heat conductivity, an aluminum alloy having been employed. In the present instance, the body of the heater units 15 are formed with four well chambers 23, arranged in arcuate formation, of similar diameter and depth, being semi-circular in cross section and of tapered formation toward the lower ends thereof. The walls defining the exterior of these chambers are of substantial thickness, the lower ends thereof being connected by a bottom wall 24, which is medially apertured and interiorly threaded for threadedly receiving the plug portion of the heating coil 21. The coil is preferably of cylindrical construction and of a length greater than half the length of the wells 23, and since the heating coil is mounted centrally and vertically of the chambers 23, a very efficient and even heat is distributed to all of the test tubes contained in the chambers. The coil 21 is provided with a binding post 25 for securement of a conductor 26 electrically connected with a binding post 27 of the thermostatic switch 20.

Within each well 23 there is suitably secured a copper crucible 28 of elongated form and having a contour similar to the test tube employed for heating the oil, the crucibles being secured in respective openings 29 formed in the top wall 30 of the heating unit. As best seen in Figures 1, 2 and 6, the top wall 30 of the heater unit is provided with an annular flange 30' integrally formed therewith and overlies and is connected to the inner periphery of the collar 14.

In the explosive proof type of heater shown in Figures 5 to 7 of the drawings, a housing 31 is employed for enclosing all electrical parts, and as here shown comprises a main hollow annular casting 32, centrally apertured and through which the threaded plug of the heating coil 21 may pass to engage the threaded aperture of the base 24 of the heating unit 15. The casting 32 is provided with an interiorly threaded nipple 33 into which the threaded end 34 of the outlet 22 is engaged. The casting 32 further has an annular flange 35 exteriorly threaded to receive a closure cap 36. Thus if any sparks or short circuiting occurs, such would be confined within the housing 31. Any suitable insulating material may be disposed within the housings 11 and around the heater unit 15.

It should be noted that in both forms of the device, the heating coil 21 is positioned medially of the heating unit 15 in close proximity to the copper crucibles 28 and due to the high heat conductivity between the retort body and the copper crucibles, oil in the test tubes supported in the crucibles will be rapidly and uniformly heated to a temperature controlled by the setting of the thermostatic switch 20, which is associated with a suitable source of current, such as the battery of a motor vehicle or otherwise. It will be appreciated that the tapered formation of the crucibles 28 is instrumental in the rapid heating of oil in the lower part of the test tubes; and that provision of a closure 16 as shown and described will permit release of any fumes into the space above the crucibles.

While I have shown and described preferred forms

3

of the device, this is by way of illustration only, and I consider as my own all such modifications in constructions, as fairly fall within the scope of the appended claims.

I claim:

1. A heating apparatus for heating test tubes containing oil comprising a housing having an upright encircling wall, a top wall having an annular collar and a bottom wall, a heater unit within said housing and suspended from said top wall, said heater unit being formed from a metal of high coefficient of heat conductivity, said heating unit having a plurality of vertically disposed elongated tapered chambers arranged in arcuate formation and positioned medially of the housing, an elongated tapered copper crucible fixed in each chamber for support of a test tube, an elongated heating coil within the housing positioned centrally and vertically of said copper crucible, said heating coil being of a length greater than one-half the length of said copper crucibles,

4

a closure for the top wall so constructed as to be in spaced position above said annular collar and open ends of the crucibles when said closure is closed and means within the housing for supplying controlled electrical energy to said heating coil.

2. The structure of claim 1, wherein a housing is secured upon the interior of the bottom wall of the housing for support of the heating unit and enclosing the means for supplying electrical energy to said heating coil.

References Cited in the file of this patent

UNITED STATES PATENTS

1,694,725	Tabb	Dec. 11, 1928
2,090,666	Copeland	Aug. 24, 1937
2,299,401	Melton	Oct. 20, 1942
2,487,161	Melton	Nov. 8, 1949