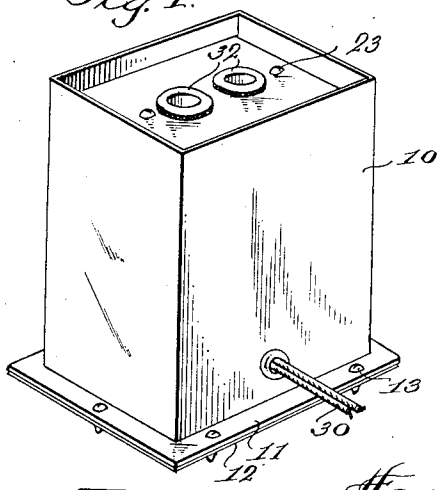
Oct. 20, 1942. W. L. MELTON 2,299,401

ELECTRICAL OIL HEATING DEVICE

Filed March 26, 1941

Fig. 1.



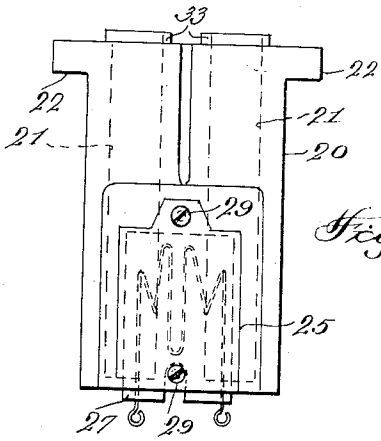
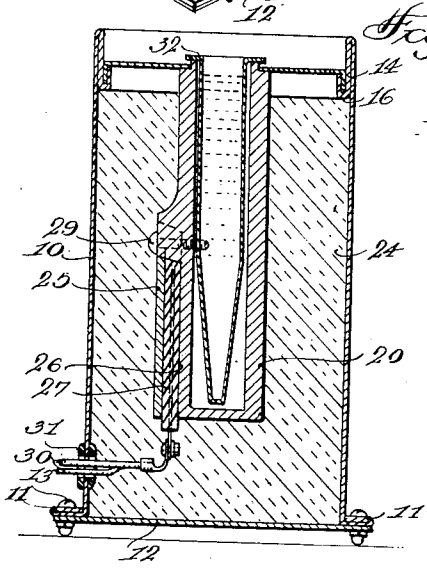


Fig. 5.

Fig. 2.



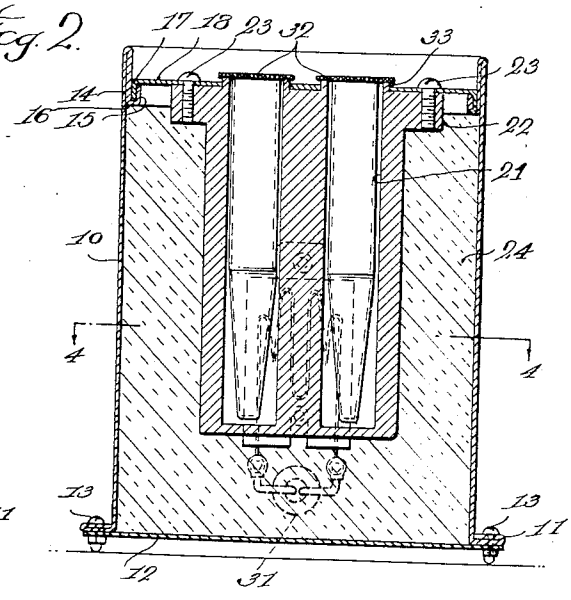


Fig. 3.

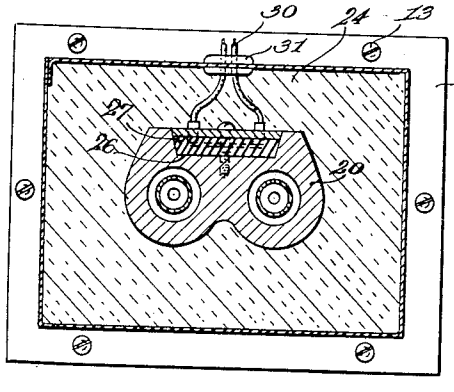


Fig. 4.

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UNITED STATES PATENT OFFICE

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ELECTRICAL OIL HEATING DEVICE

William L. Melton, Selman City, Tex.

Application March 26, 1941, Serial No. 385,375

1 Claim. (Cl. 219—19)

The 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 or pipe lines, whereby purchasing agents from refiners, lease or professional gagers, may heat their samples of oils to be tested, and has for an object to present an effective form of apparatus which may be readily used in the field without expensive equipment and at a distance from laboratory facilities or power sources other than ordinary automobile power plants.

It is a special aim of the invention to present a novel and compact retort device and manner of utilization of the same for the attainment of highly satisfactory manner of heating samples of oil from wells, field tanks, storage tanks or pipelines satisfactory to the parties interested, such as buyer and owner, or prospective leaser, and owner, or between refiners, producers or pipe lines, in determining the rating of a given product without requiring the parties to travel to any specially appointed place, but enabling the test to be made at the well or pipe line.

An additional object is to present a device of this kind with a double retort, one for holding test sample and the other to hold an oil of low volatility, and in which the temperature of both retorts may be maintained at the same degree level with certainty, and in which ordinary test tubes may be utilized to hold the sample and comparison specimens.

Another object is to present an article of this kind which will be extremely rugged and free from liability of damage incident to rough handling in travel, and in which dependable heating of samples may be effected in the necessary ranges required for tests. It is a further aim to present a novel construction in the retort and manner of incorporation of the heating elements therein and the securement of the same for the attainment of the above named objects.

Additional objects, advantages and features of invention reside in the construction, arrangement and combination of parts involved in the embodiment of the invention, as will be more readily understood from the following description and accompanying drawing, wherein

Figure 1 is a perspective view of a testing unit wherein my invention is embodied.

Figure 2 is a vertical cross section thereof.

Figure 3 is a vertical cross section at right angles to Figure 2.

Figure 4 is a horizontal section on the line 4—4 of Figure 2.

Figure 5 is an elevational view of the retort element detached.

There is illustrated a portable tester unit illustrated here approximately one-half actual size, in Figures 2 and 4, and consisting of a sheet metal case 10, rectangular in plan, and embodying novel features for the support of the retort device, to be subsequently described. The four side wall portions of the case may be formed of a single sheet of 20 gauge sheet metal, and at its lower part is formed with outstanding foot flanges 11, to which a simple base plate 12 is secured by screw or other fastening 13. The top edges of the walls are returned sharply, as at 14, and the inner extreme edges of these return portions are then bent upwardly as at 15, in slightly spaced relation to the upper return portion and affording a step joint or socket 16, receiving downturned flanges 17 of a top plate 18 set within the walls of the case. The upturned portions 15 stop at a level below the bend at which the returns 14 spring from the wall, and the plate 18 lies closely over the terminal edges of the upturned flanges 15, so that the plate lies below the upper edges of the walls proper of the case, as may be seen in Figures 2 and 3.

Set within the case thus formed, there is a retort body 20, formed of some metal of high coefficient of heat conductivity, an aluminum alloy having been heretofore employed. The retort body embodies essentially two well chambers 21, of similar diameter and depth, being circular in cross section, and the material of the retort conforming in part to the contours of the wells so as to afford thick walls around the latter. At the upper part the retort is formed with two flanges 22, receiving therein screws 23 inserted through the top plate 18, the heads of the screws resting against the plate and thus forming a suspension support for the retort. The size of the case is such that its walls are spaced from the retort sufficiently to accommodate a packing of proper insulation material 24. At the lower part of the retort it is thickened on one side, the thickened part extending across both of the walls. This thickened part is relieved or recessed, as at 26, to accommodate a suitable conventional heating element 27, which is set therein with suitable insulation and held in place by a thick plate 25 secured to the retort by means of screws 29, or otherwise, as found desirable. From the terminals of the heating elements 27 conventional connections are made at 29, with wires 30, which are led out through a suitably bushed opening 31 in the case. The wires 30 may be led to any con-

ventional source or supply of current suitable for energizing the unit 27 to heat the retort, these being well understood in the art and commercially available so that they do not form a novel feature of my invention and are not illustrated herein. These may include the conventional six volt battery of an automobile and an interposed rheostat switch.

The upper end of the retort 20 is formed with raised lips 33 around the inner edges of the walls 21, the walls of the retort being much thicker and extending laterally a distance beyond the lips, and the wells are spaced apart a distance at least equal to the thickness of the wall portion around each well, these wall portions merging and being joined throughout the height of the retort, so that the joined portion extends over a substantial distance horizontally but vertically to maintain a uniform temperature in both wells. The top plate 18 of the case is formed with two apertures fitted around the lips 33, as shown, although the fit of the plate around the lips is not necessarily a critical feature. The extension of the lip portions 33 enables the use of test tubes 32 having flared lip portions, as shown, which may be set in the wells 21, respectively, with their lip portions resting upon the lips 33 of the wells so that the tubes are thus supported with a minimum of material exposed above the retort, the lips 33 contributing to the efficiency of the device by effective conduction of heat directly to the extreme upper part of the retort.

In the use of the device, kerosene supplied to the device in such degree as to raise the temperature of the retort to a predetermined degree, and the kerosene adjusted so as to tend to maintain its temperature, a test tube with a given quantity of the oil to be tested is set in one of the wells, while a like tube containing a specimen of oil of known volatility is set in the other well. The quality of the oil being tested may then be determined by a comparison of the volume with that of the specimen of known volatility at the end of a given period of time at the temperature determined, after one method; or, other methods may be employed as practiced or as found expedient in the art. By the comparison method the maintenance of a fixed temperature is not a critical element of the test, necessarily, and an approximation of a suitable temperature for the test will give a basis for effective judgment of the quality of the oil tested. After other methods, a test tube of a given quantity of oil being tested may be introduced into the retort, and maintained at a predetermined temperature for a given period of time, and its value determined from one standpoint by the decrease of volume during the test.

While I have herein disclosed a specific embodiment of my invention, showing its full details, as heretofore employed in actual use, it will be understood that various modifications in the construction, arrangement and proportion of parts, substitutions of materials and mechanical equivalents, may be carried out without departing from the spirit of the invention herein disclosed, as more particularly set forth in the appended claim.

It will be appreciated that by the manner in which the retort is attached to the case, in addition to the terminals of the heating elements being held in cushioned spaced relation to the walls and the bottom of the case by the insulating material 24, due to the resilience of the metal of which the case is constructed (by reason of the inherent resilience of such metals as commonly employed), the plate 18 will serve as a resilient support for the retort, preventing the parts from dropping upon the terminals 29 in case the unit is dropped, and the manner in which the plate 18 is supported in the step joints around the edges of the walls affords a very secure mounting for the retort at the same time. It will be also appreciated that the construction affords ready access to the elements of the device, in case of need for repair or replacement, and that it may be manufactured and assembled with the simplest operations, involving a minimum of cost for materials and labor.

I claim:

An oil tester of the character described, comprising a retort body of substantial thickness of metal of a high co-efficient of heat conduction, said retort having two vertical wells therein open at its upper end for reception of respective open tubes of oil, an electrical heating unit in one side of the retort of a width extending over a major portion of the wells, means for forming connections between said heating unit and an electrical source, an enclosing case for said retort, an insulating material between the walls of the case and the retort, the top wall of the case extending closely over the retort and having openings aligned with the wells of the retort, and suspension connections between said top wall and retort, for the purposes described.

WILLIAM L. MELTON.