Oct. 4, 1949. R. F. BECKER 2,483,993

DEGREASING VAPORIZOR

Filed July 17, 1947 2 Sheets-Sheet 1

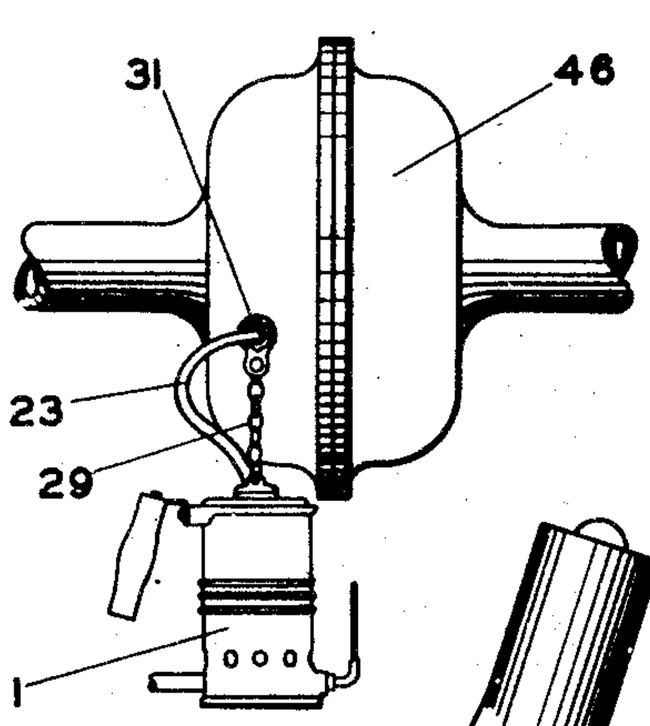

FIG. 1

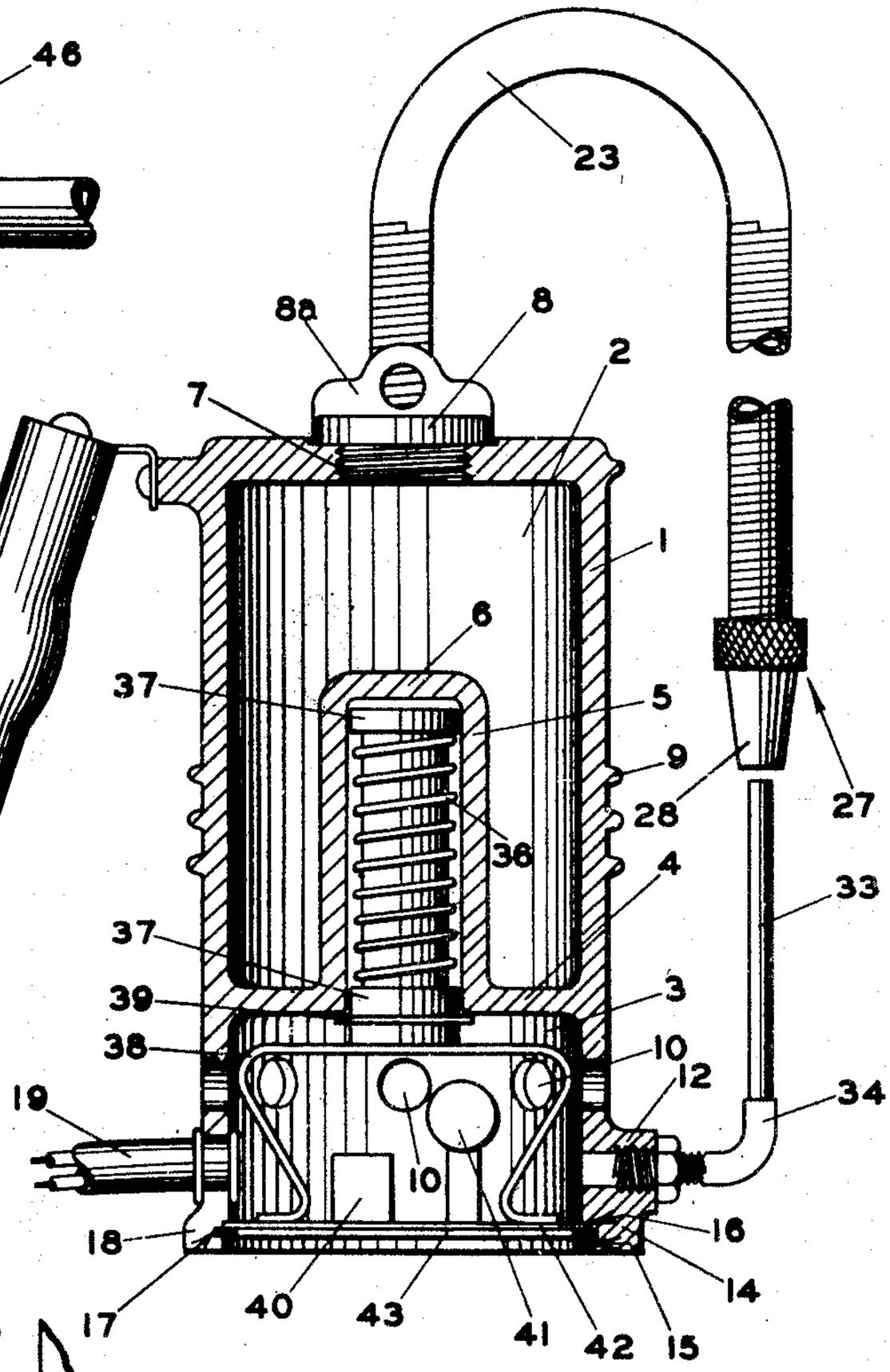

FIG. 3

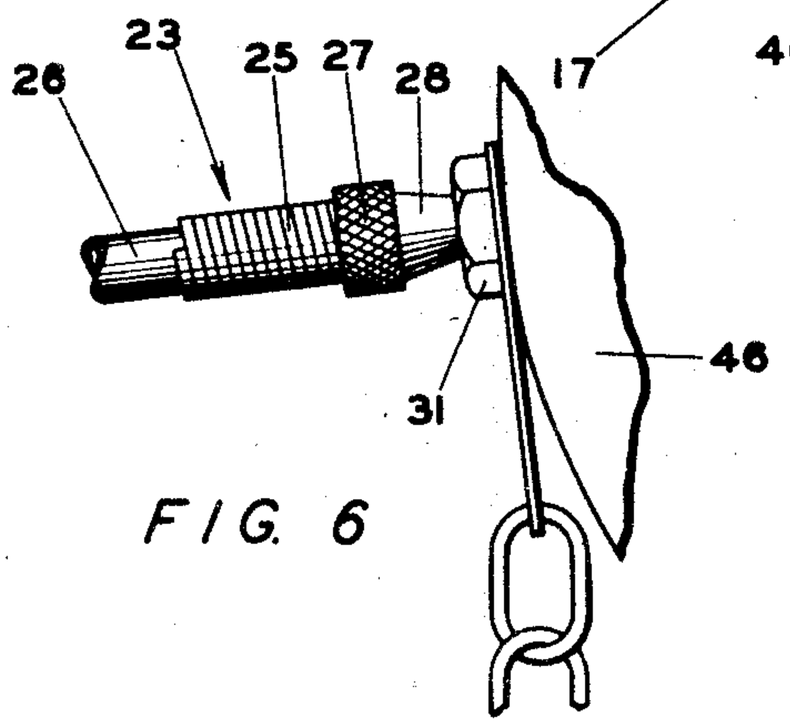

FIG. 6

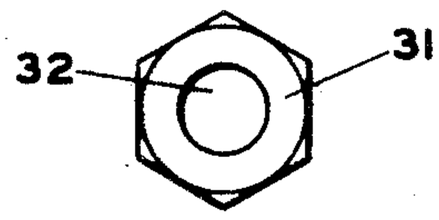

FIG. 5

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DEGREASING VAPORIZOR

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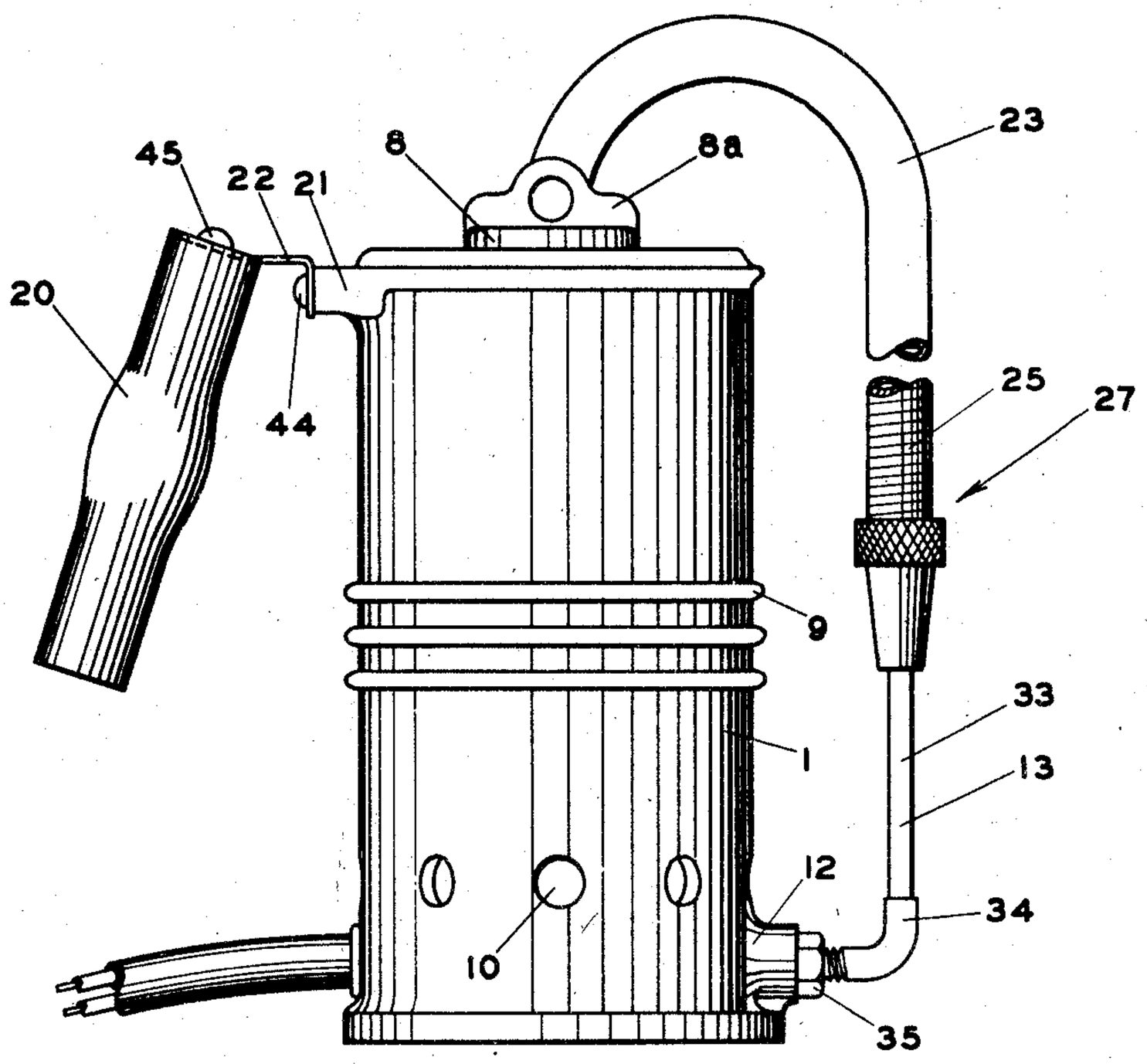

FIG. 2

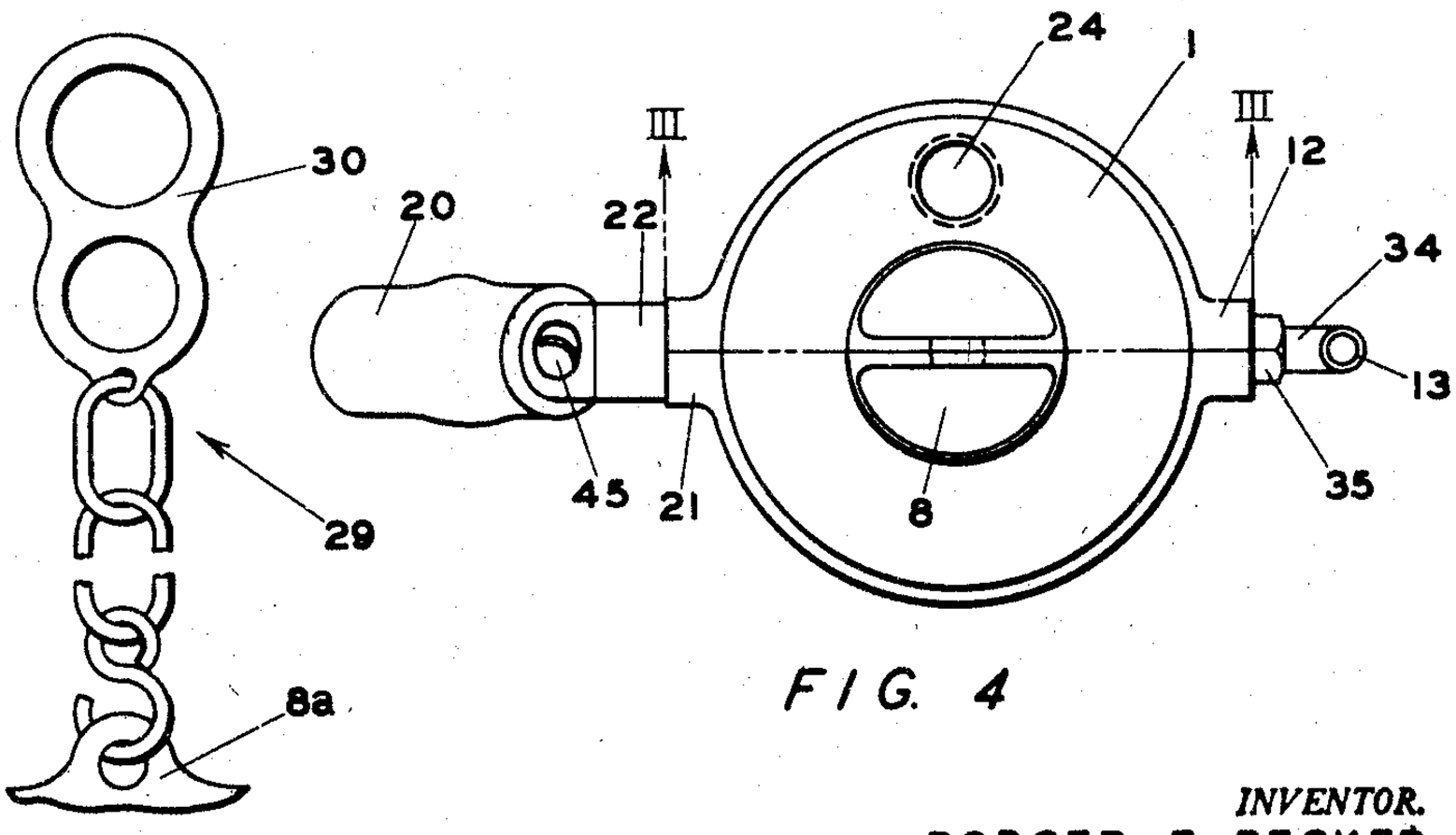

FIG. 7

FIG. 4

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DEGREASING VAPORIZER

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2 Claims. (Cl. 34—104)

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This invention relates to degreasing devices and particularly to one designed to vaporize a grease solvent and pass the resulting vapors into a closed gear housing.

Although the method of degreasing involving the use of a vaporized solvent is old, the apparatus heretofore employed for this purpose has not been satisfactory. The design of the vaporization chamber and related heating unit has provided a small heat transfer surface resulting in slow operation. In addition, it has involved equipment requiring special parts and additional operations to place it in operating condition and has required a separate solvent container for each operation. A different size of container has been necessary for each job requiring a different quantity of solvent. Furthermore, the design of this equipment has consisted of several parts which are disconnected when in non-operating condition and often become separated and mislaid between operations.

My invention eliminates these undesirable characteristics by providing in a single unit, in the specific embodiment here illustrated and described, a vaporizer having a quick heating, permanent reservoir together with all the necessary equipment for operation.

Accordingly, a major object of my invention is to provide a degreasing solvent vaporizer having a reservoir capable of rapid heating.

Another object of my invention is to provide a vaporizer having a single reservoir capable of being used in any degreasing operation irrespective of the volume of solvent necessary.

An additional object of my invention is to provide a vaporizing unit having all the necessary operating parts associated therewith.

A further object of my invention is to provide a vaporizer which may be attached easily and quickly to the unit to be degreased.

A still further object of my invention is to provide a vaporizing unit of such design that it will withstand rough usage without functional damage over a long period of time.

Other objects and purposes of my invention will be apparent to those acquainted with equipment of this type and the disadvantages which it is intended to remedy, upon reference to the accompanying drawings and the following specification.

In the drawings:

Figure 1 is a side elevational view of my vaporizer showing it mounted in operating position to a gear housing.

Figure 2 is a side elevational view of my vaporizer.

Figure 3 is a sectional view in side elevation

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of my vaporizer cutting on a central plane all the parts except the heating unit, handle and stowage arm.

Figure 4 is a top view of my vaporizer with the vapor conduit removed.

Figure 5 is a front view of the attaching nut of my vaporizer.

Figure 6 is a fragmentary view of the vapor conduit of my invention attached to a gear housing in operating position.

Figure 7 is an enlarged fragmentary view of parts of the support member for my vaporizer.

In the folowing description, free use will be made of the term "upper" and "lower" to denote parts of the described elements. Such references are all to the parts concerned as illustrated in any of the several figures of the drawings.

In providing a vaporizer meeting the objects and purposes set forth above, I have provided a housing containing a vaporization chamber and a heating unit together with a flexible vapor conduit designed to frictionally seat in a closure nut threaded into an opening in a gear housing and independent support means detachably suspending the reservoir and its associated parts from the housing.

Referring now to the drawings in more detail, the numeral 1 indicates a cylindrical housing having a vaporization chamber 2 in its upper portion and heater chamber 3 in its lower portion, separated by a bulkhead 4 (Figures 2 and 3). The heater chamber 3 is extended above the bulkhead 4 by a tubular member 5 substantially concentric with the housing 1 and having a closed upper end 6. A centrally located threaded opening 7 is provided at the top of the vaporization chamber 2. The threaded closure member 8 fits into and detachably closes this opening. The closure member 8 is circular with a centrally disposed upwardly extending web 8a having an opening therethrough for purposes appearing hereinafter.

A series of external rings 9 surround the vaporization chamber portion of the housing 1 to facilitate holding the vaporizer should it be desirable, when it is cold, to grasp it other than by its handle.

Below the bulkhead 4 a series of equally spaced ports 10 pass through the wall of the housing. The purpose of these ports will be described more fully hereinafter. The substantally circular boss 12 is threaded to provide a mounting for the stowage member 13. Below the boss 12 the wall of the housing 1 extends radially outwardly to form a flange 14. This flange provides a base for the housing. The interior of the base is counterbored

15 to form the internal circumferential shoulder 16. A groove 17 is provided in the wall of the counterbore. The purpose of the counterbore 15 and the groove 17 will be explained more fully hereinafter. A slot 18 through the flange 14 and the wall of the housing extending upwardly from the bottom of the housing provides a means of entrance for the electrical cable 19. This slot, although not necessarily so located, is here shown diametrically opposite the boss 12.

The housing 1 and the closure member 8 are preferably of cast aluminum. Although other metals such as steel, brass or copper could be substituted, aluminum produces a more satisfactory product by reason of its light weight, corrosion resistance and quick-heat conducting characteristics.

The handle 20 is made from any suitable thermo-insulating material, such as wood or plastic and mounted to the boss 21 by a bracket 22.

The conduit 23 is mounted to the housing 1 at the threaded opening 24 (Figure 4) which provides communication between the vaporization chamber 2 and the conduit. The conduit consists of a helical, wire, exterior casing 25 with a flexible interior tubular lining 26 (Figures 2 and 6). The lower end of the conduit terminates in a threaded fitting adapted to fit the opening 24 (Figure 4). The opposite end of the conduit terminates in nozzle 27 havng a knurled grip and a tapered nipple 28.

The support member 29 (Figures 1 and 7) has a hook on one end and an attachment plate 30 on the other. The attachment plate 30 has openings of two different diameters to accommodate different sizes of closure nuts 31, the latter to be more fully described hereinafter. The portion of the support member connecting the hook and attachment plate may be in the form of a chain as illustrated, or any other type of flexible linkage capable of supporting the vaporizer.

The closure nut 31 consists of a hexagonal portion and a male threaded boss. A hole 32 is of such diameter and taper that it will frictionally engage the nipple 28 when a sufficient portion of the nipple has been inserted into the hole. In each of the several diameters of closure nuts the hole 32 has the same size and taper so that the nipple 28 will fit into each.

The stowage member 13 (Figure 2) consists of a rod or tube 33 rigidly attached to an elbow 34. The rod member 33 is of such diameter that it will fit inside the nozzle 27. The elbow is threaded into the nut 35 which, in turn, is threaded into the boss 12.

An electrical resistance heating element 36 (Figure 3) is seated within the tubular member 5 and concentrically spaced therein by the guides 37. The heating element is supported on a bracket 38 with spacers 39 being provided between the heater and the bracket if and where needed. A thermostatic control member 40 and a visual signal 41 are connected in series with each other and with the heater and operatively connectable with a source of electrical potential through the cable 19. The heating element, light and mounting therefor and the thermostat are each of standard commercial construction and inasmuch as they form no part of my invention detailed description of them need not be given.

The bracket, light and thermostat are mounted upon a disk-shaped support plate 42. The diameter of the disk plate is such that it will fit within the counterbore 15 and rest against the shoulder 16.

Assembly

The guides 37 are frictionally mounted at each end of the heating element 36 by seating them on portions thereof having suitably reduced diameters. The heater element and bracket 38 are assembled with the spacers 39 therebetween by any suitable means such as screws or bolts. The bracket 38, the light 41 and the thermostat 40 are attached to the support plate 42 with suitable fasteners such as screws or bolts. The electrical cable 19 seats in the slot 18 and is attached in such a manner as to provide an operative circuit for the heater element, light and thermostat. The support plate 42 together with the parts attached thereto is then inserted in the counterbore 15 until it rests against the shoulder 16. A circular retaining spring 43 seats in the groove 17 with a portion projecting therefrom to hold the plate and assembly in place. When the assembly is thus in place the heating element 36 occupies the interior of the tubular member 5 and is held concentric therewith by the guides 37. The wire 19 seats in the slot 18.

The stowage assembly is attached by installing the nut 35 in an opening in the boss 12. The elbow 34 is then threaded into the opening in the nut and the support tube 33 attached to the elbow in a vertical position.

The handle bracket 22 is attached to the boss 21 by screws 44 or other suitable fastening means. The handle and bracket are assembled by a screw or bolt 45.

The conduit 23 is attached to the housing 1 by threading the lower end of it into the opening 24.

Operation

The desired quantity of solvent is poured into the vaporization chamber 2 through the opening 7. The closure member 8 is then put in place to close this chamber.

The nut 31 is passed through one of the openings in the attachment plate 30 (Figure 7) and then inserted in the opening in the gear housing 46 (Figure 1). The vaporizer is hung on the support member 29 by hooking the end of the support member through the hole in the closure member web 8*a*. The nozzle 27 of the conduit 23 is then inserted in the hole 32 of the nut 31 until the cone-shaped nipple engages the walls of the hole sufficiently to support the conduit by the frictional seizure between the parts.

The wire 19 may then be connected to a suitable source of electrical power. The heat generated by the heating element 36 causes the solvent to vaporize and pass into the gear housing 46 by means of the conduit 23. Since the tubular member 5 is both concentric with the housing and projects upwardly into the vaporization chamber a substantial distance, the resultant heated surface contacting the solvent is relatively large in proportion to the total volume of solvent involved. This renders the unit both swift and efficient in operation. When all of the solvent has been vaporized the increase in temperature incident to the end of the cooling effected by evaporation causes the thermostat 40 to break the electrical circuit.

The light 41 operates whenever the heater is functioning to inform the operator of this fact and goes out when the thermostat opens the series circuit. The ports 10 permit the operator to see the otherwise enclosed light.

When the vaporizer is not in use the various sizes of closure nuts 31 and the support member 29 are placed upon the stowage member 13 and

the nozzle 27 is placed over the end of the stowage member. By this means the various unattached parts are kept with the apparatus and prevented from being lost.

Obviously, many variations may be made in the details of my invention. Accordingly, the various modifications which will be evident to persons acquainted with articles of this type are all included within the scope of my hereinafter appended claims excepting as said claims by their own terms expressly provide otherwise.

I claim:

1. An apparatus for degreasing gears within a housing having a threaded opening, comprising: a body member having a reservoir therein and having a threaded opening in its top; a means for heating the contents of said reservoir; a threaded cap within said opening for closing said reservoir; a threaded plug member having a central opening and adapted for entering the opening in said housing; a support member removably mounted to said housing by detachable engagement with said plug member on its one end and detachably mounted on its other end to said body member; a flexible conduit leading from said reservoir to said housing and adapted for detachable frictional engagement in said opening of said plug member and providing fluid communication from said reservoir to said housing.

2. An apparatus for degreasing gears within a housing having a threaded opening, said apparatus including a body member having an internal, heated reservoir therein open at its upper

end, the improvement in means for holding same in operative relationship to said housing, comprising: a removable closure member for said reservoir; a threaded plug member having a central opening and adapted for entering the opening in said housing; a support member adapted on its one end for being removably mounted to said housing by encircling said plug member; a hook on the other end of said support member detachably connecting said support member to said reservoir closure member whereby the weight of said reservoir and its contents is transmitted in full through said support member to said plug member; a flexible conduit extending from the upper end of said body member and equipped with a frusto-conical nozzle adapted for frictional engagement in said opening of said plug member for providing communication between said reservoir and said housing but carrying none of the weight of the reservoir and its contents.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,411,812	Smith	Apr. 4, 1922
2,105,761	Wood	Jan. 18, 1938
2,259,545	Black	Oct. 21, 1941
2,372,478	Farr	Mar. 27, 1945