United States Patent

[11] **3,549,861**

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[21] Appl. No. **819,563**
[22] Filed **Apr. 28, 1969**
[45] Patented **Dec. 22, 1970**

[54] **SELF-HEATED THERMOS BOTTLE**
10 Claims, 15 Drawing Figs.

[52] **U.S. Cl.** **219/441,** 215/13; 219/387, 219/437, 219/541
[51] **Int. Cl.** **F27d 11/02**
[50] **Field of Search** ..... 219/438-—42, 436—7, 541, 386—7, 428, 432; 248/311; 242/85.1; 220/1, 9, 17; 215/12, 13

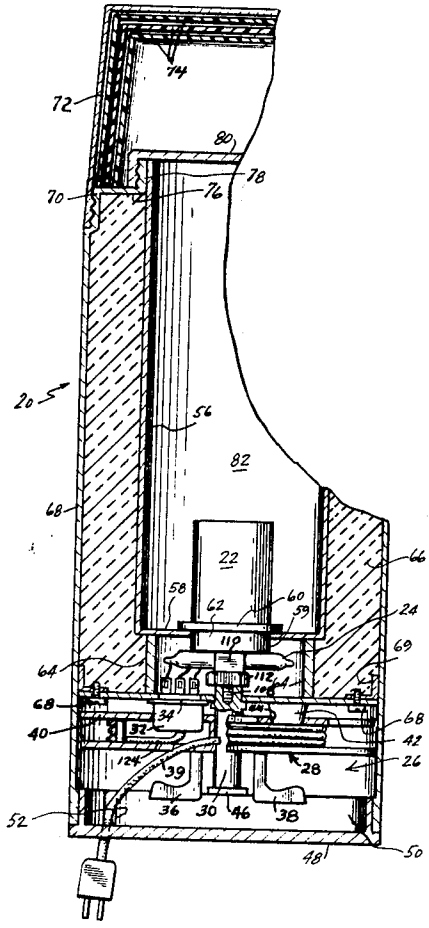
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Primary Examiner—Volodymyr Y. Mayewsky
Attorney—Polacheck and Saulsbury

ABSTRACT: A self-heating thermos bottle having a bottom compartment closed by a cover base and in which is disposed in cable either on a reel or folded up when not in use. The cable is provided with contact plugs adapted to be fitted into either a vehicle cigar lighter receptacle or household receptacle to supply either DC current or AC current to low or high voltage coils of a heater unit within the bottle and having a threaded stem extending into the cable compartment for the mounting of parts thereon. A plug is carried by a cable reel which is axially adjustably supported on the depending stem of the heater unit to disconnect plug and allow the reel to be turned for release or windup of cable. A thermostatic switch is included in the heater unit and plug circuitry. The disconnect plug is attachable to a plug carried on a bottom partition. A special socket has been provided into which either a cigar lighter plug or a household plug can be connected. Also multiple plug receptacles have been provided on a bottom partition and wired to the heater unit and adapted to receive either the vehicle lighter plug or the household plug on respective opposite ends of a cable.



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SHEET 1 OF 4

Fig. 1.

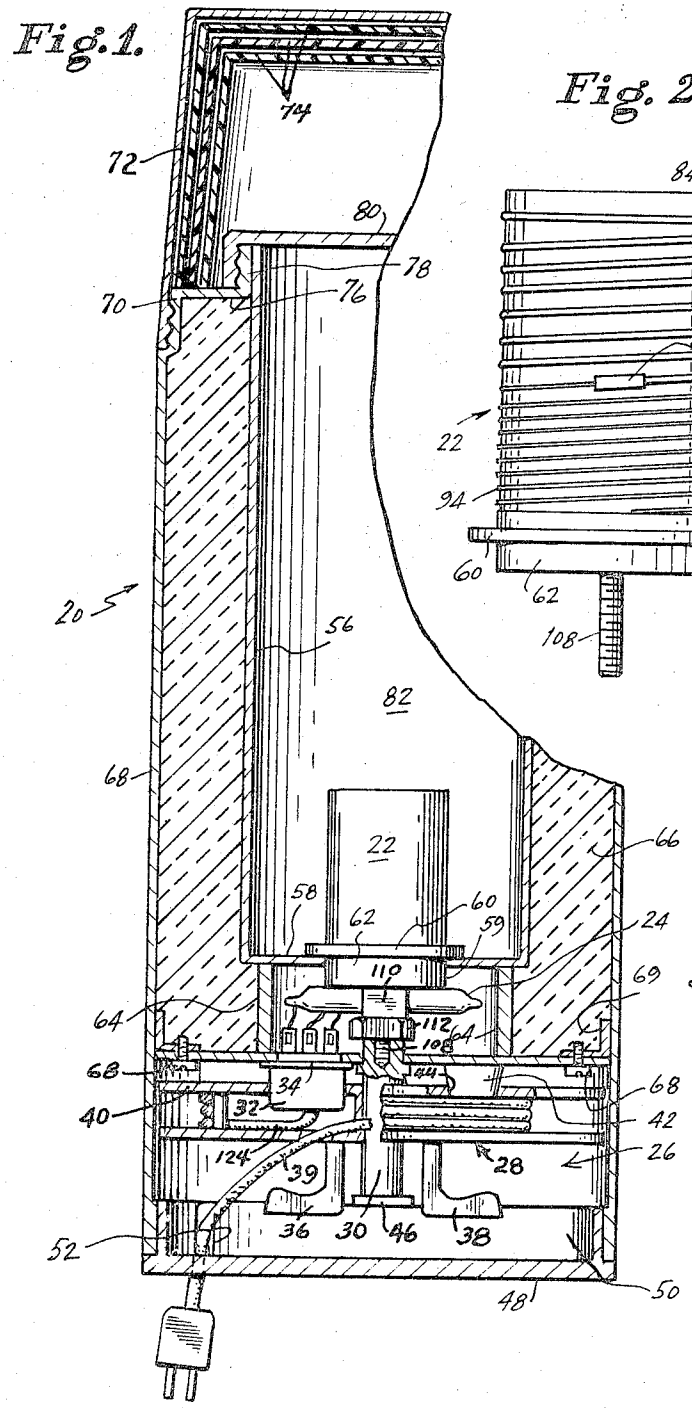
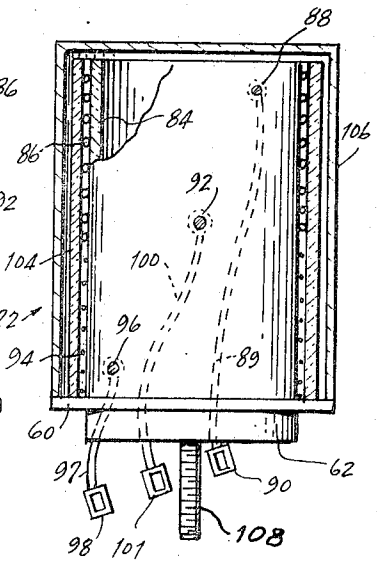


Fig. 2.

Fig. 3.



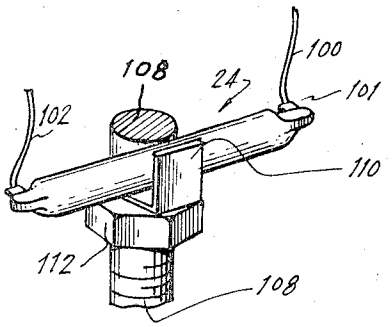


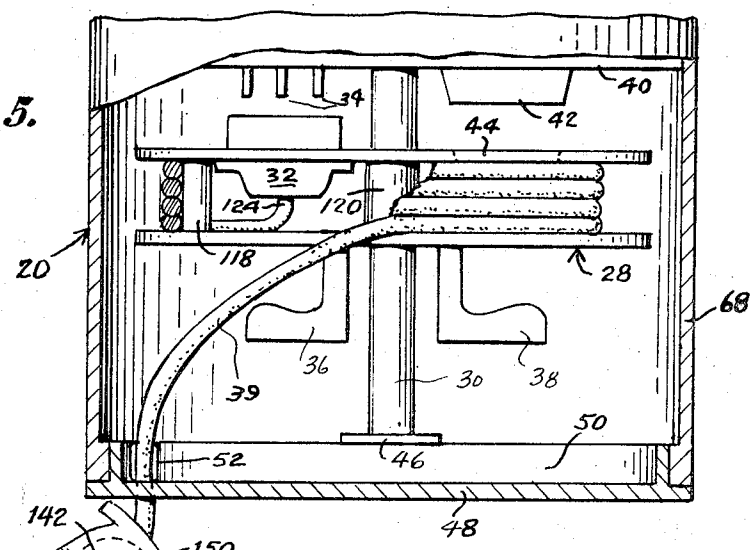
Fig. 4.

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Fig. 5.



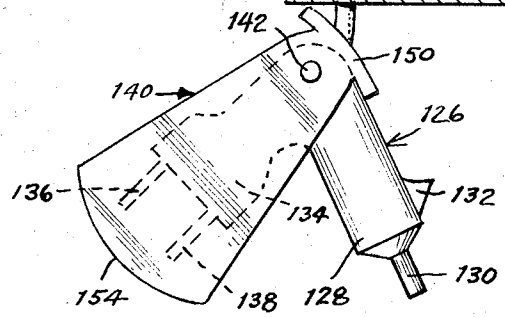
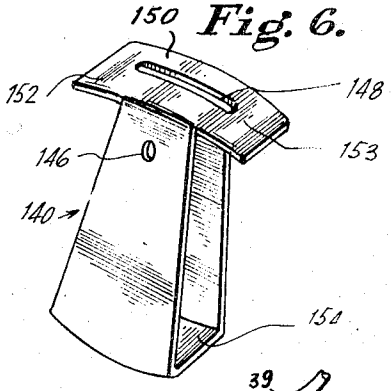


Fig. 6.



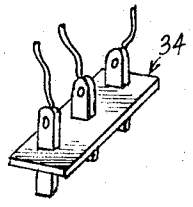
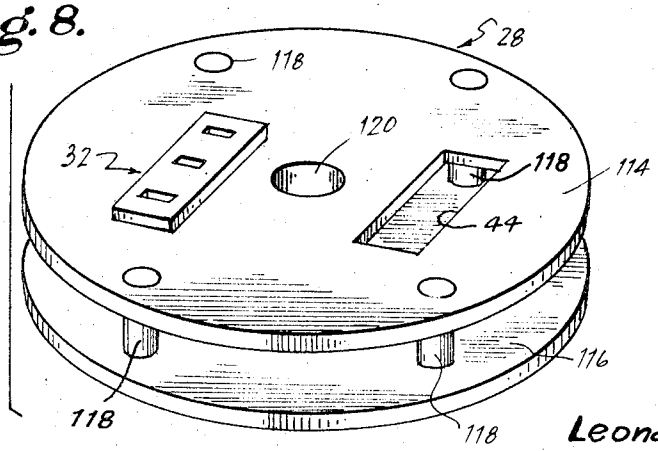


Fig. 8.



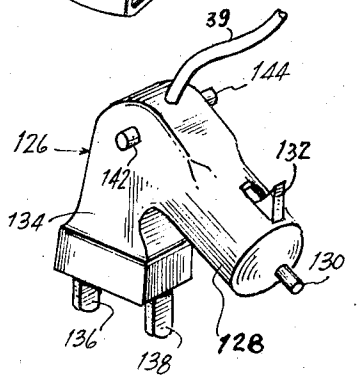


Fig. 7.

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Fig. 9.

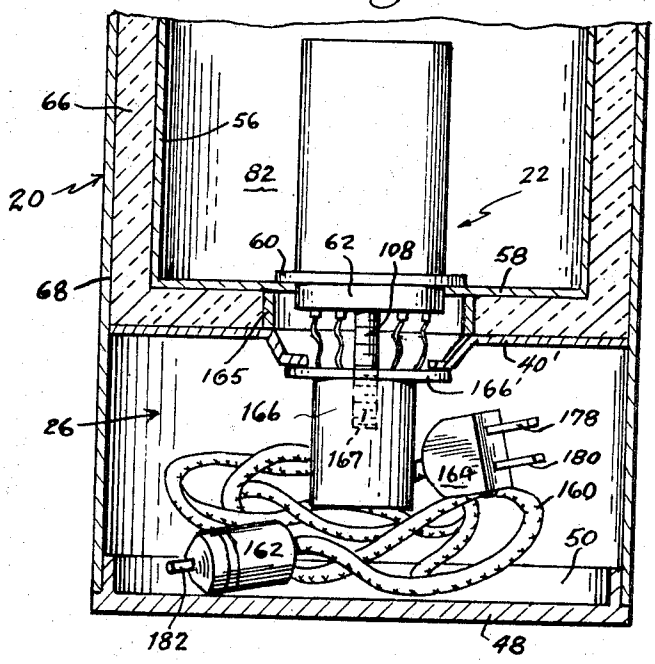
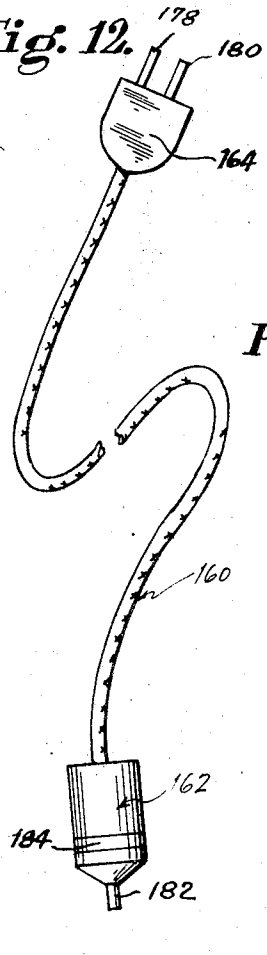


Fig. 12.



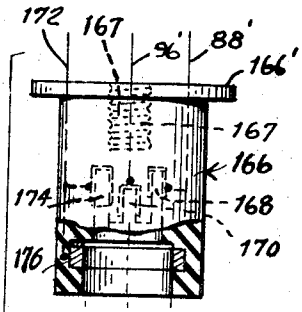
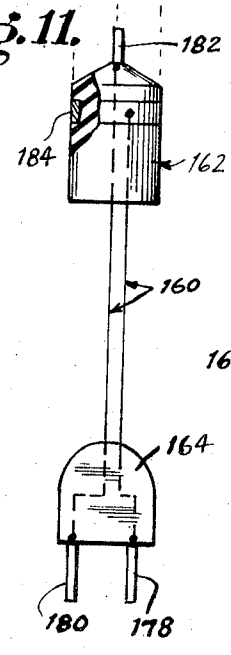


Fig. 11.



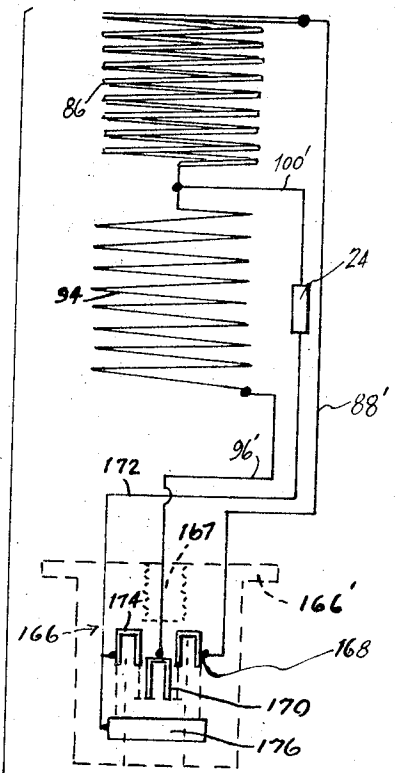
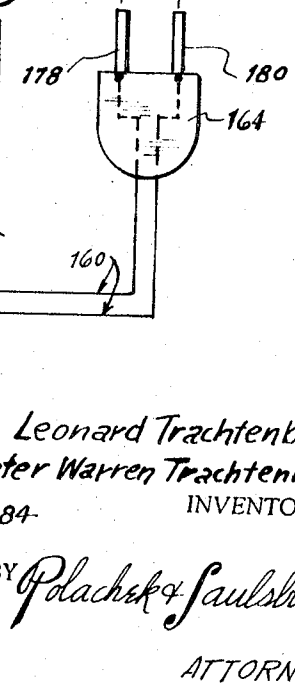


Fig. 10.



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Fig. 13.

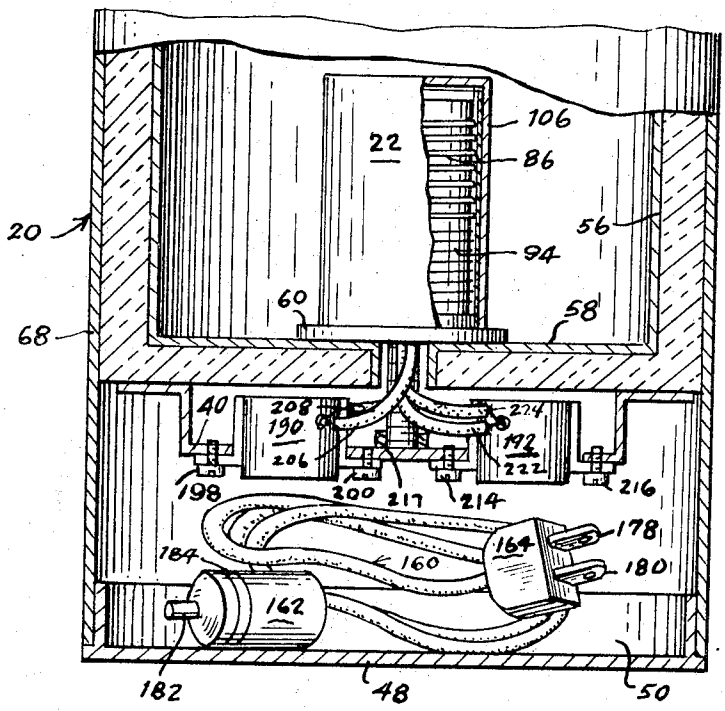
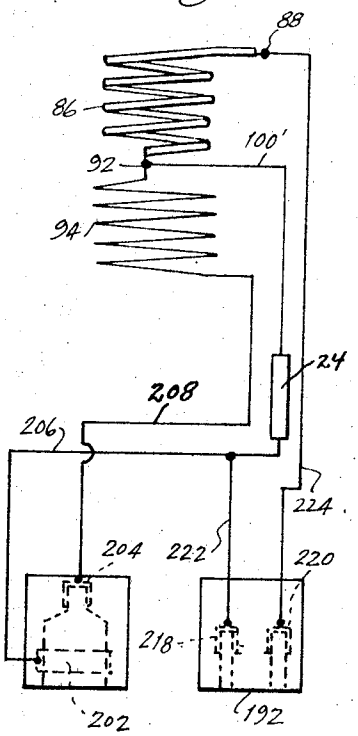


Fig. 15.



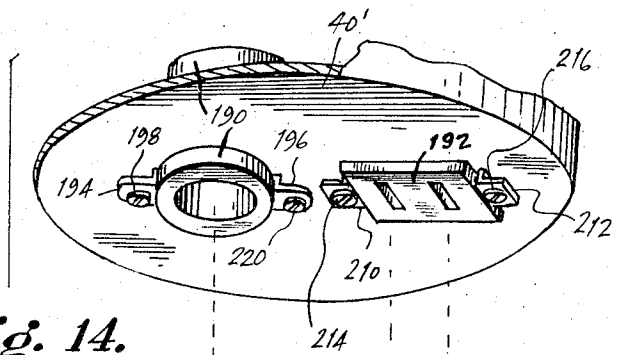
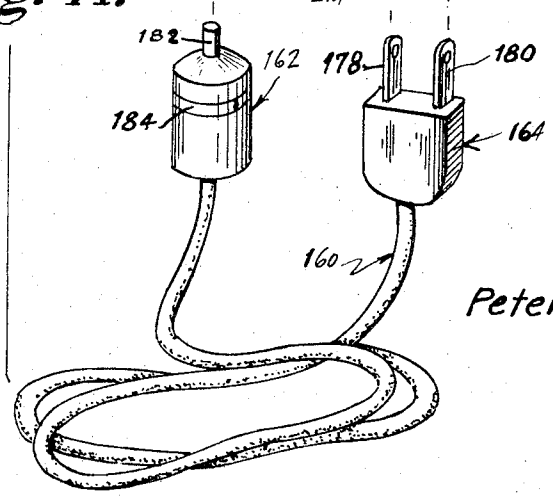


Fig. 14.



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SELF-HEATED THERMOS BOTTLE

It is the principal object of the present invention to provide a self-heated thermos bottle which can receive its source of electric current from either a cigar lighter outlet on a dashboard of a vehicle or from a household electric receptacle.

It is another object of this invention to provide a self-heated thermos bottle adapted to receive electric current from either a vehicle battery or household receptacle in which a single electric cable can be adapted for use from either source by merely reversing the ends of the cable between the bottle and the electric source receptacle with the terminal for either a DC or AC type of receptacle adapted to be received in the bottle to supply current to either a DC or AC heating coil thereof.

It is another object of the invention to provide in a self-heated thermos bottle, a reel for the coiling of the cable when not in use into the bottom of the bottle in which connection means is provided between the reel and the bottom of the bottle that will be disconnected when coiling the cable upon the reel, the reel being axially adjustable upon a depending stem and engageable with a positioning stud to prevent turning and destruction to the connection means upon attempting to turn the reel without the axially lowering the reel to break the connection of the reel cable with the heater coil terminals in the bottom of the bottle.

It is still another object of the invention to provide a self-heated thermos bottle adapted to have an electric cable reel axially slidable upon a depending bottom stem to plug the cable into connection with the heater coil in which the cable has on its outer terminal a multiple-type plug for connection with either a vehicle cigar lighter outlet or AC house receptacle and the bottom construction of the bottle cable reel compartment being such that after opening the cover base and removing the plug terminal and cable therefrom and replacing the cover, the bottle will be provided with a base upon which it can be stood upright on a table top surface, the cable passing through aligned side notches of the base and the side of the bottle.

It is a further object of the invention to provide a self-heated thermos bottle adapted for connection with either a vehicle cigar lighter receptacle or a household receptacle having a compartment in the bottom of the bottle for containing the cable when not in use in which the heater coils are wired to a solitary socket terminal means adapted to receive either a cigar lighter type of plug on one end of the cable or a two-pronged electric receptacle plug provided on the other end of the cable, the plug receptacle being wired to DC AC coils of the heater unit.

It is a still further object of the invention to provide dual DC and AC self-contained heating unit for self-heated thermos bottles that can be readily installed in the bottle and which has a depending stem serving to secure the heating unit to the bottom of the bottle that may also serve for a connection of a thermostat, cable reel and other parts of the bottle structure.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawings, in which:

FIG. 1 is a vertical sectional view of a self-heated thermos bottle constructed according to one form of the invention, having a cable reel with a plug connector to disconnect the cable from the bottom of the bottle to allow the reel to rotate to wind or unwind the cable but in which the reel is forced upwardly to make the plug connection with the heater coil when the bottle is to be heated.

FIG. 2 is a side elevational view of the DC and AC heater unit showing the coils wound upon the inner porcelain or insulating cylinder of the heating unit and the depending attaching and other parts supporting the shaft.

FIG. 3 is a fragmentary and vertical sectional elevational view of the heating unit showing the heater coils disposed between the porcelain cylinder and a cap-shaped covering sleeve providing the closed exterior of the heating unit.

FIG. 4 is a perspective view of a thermostatic switch element wired into relation with the heater coils to limit the supply of current thereto and of the depending stud of the heater unit on which the thermostatic switch is carried.

FIG. 5 is a fragmentary elevational view of the lower end of the bottle broken away to show the cable reel disconnected from the heater coil terminals and a multiple-type plug extending from the bottle with the cable extending through the open lower end of the bottle and base.

FIG. 6 is a perspective view of the guard for the multiple-type plug.

FIG. 7 is a perspective view of the multiple-type plug terminal without the guard.

FIG. 8 is a top perspective view of the cable reel removed from the reel compartment at the bottom of the heater bottle and showing the plug receptacle thereon with illustration as to the making of the connection of the reel with the triple-prong plug depending from the heater unit.

FIG. 9 is a fragmentary vertical sectional view of a self-heated thermos bottle constructed according to a modified form of the invention in which the cable reel in the cable compartment is dispensed with and a cable having a different type of plug on each of the opposite ends thereof is used with a solitary receptacle depending into the cable compartment from the heater unit and that is adapted to receive either type plug terminal.

FIG. 10 is a collective wiring diagram of the DC and AC heater coils and solitary plug receptacle and of the cable and the plugs thereof and with the pronged plug of the cable being arranged for insertion into the solitary receptacle as when the heater unit is adapted for receiving power from a vehicle dashboard DC cigar lighter receptacle.

FIG. 11 is a collective diagrammatic view of the solitary heater coil plug receptacle and of the cable adapted for the cigar lighter plug terminal to be plugged thereinto and for the heater to receive its current from a household receptacle.

FIG. 12 is a perspective view of the cable and of the different type plugs on opposite ends thereof.

FIG. 13 is a fragmentary and sectional view of a self-heated thermos bottle constructed according to another modified form of the invention, without the reel and instead of having a common plug receptacle in the cable compartment, two separate receptacles are provided for the cable plugs.

FIG. 14 is a fragmentary bottom perspective view of the receptacle supporting plate in the bottom of the bottle removed therefrom and of the cable with illustration being made of the connection of the cable plugs therewith as when the cable is not in use and in the manner in which it is adapted to be folded into the compartment in the bottom of the bottle.

FIG. 15 is a wiring diagram of the multiple plug receptacle arrangement of FIG. 13.

Referring now particularly to FIGS. 1 and 8, there is generally shown a self-heated thermos bottle indicated generally at 20 having a heater unit 22, a thermostatic switch 24 and wired connection therewith, a cable reel compartment 26 mounted with a cable reel 28 therein for rotation upon a stem extension 30 of the heater unit 22 and for axial adjustment with respect thereto for engagement of a reel plug receptacle 32 with heater coil plug terminals 34, opposing handles 36 and 38 depend from the reel and serving to turn the reel upon the depending stem 30 to coil the cable 39' when the reel 28 is free from engagement of its receptacle 32 with the pronged terminal 34 in bottom partition 40 of the bottle.

The partition 40 has a depending rotational polarizing stop 42 adapted to enter opening 44 of the reel 28 when the reel is centered for receiving the plug receptacle 32 and the prongs of the bottom wall terminal 34.

A stop screw 46 is provided on the lower end of the stem extension 30 to limit the downward movement of the reel and while winding the cable upon the reel 28 or removing the cable therefrom for connection of the cable with an outside plug receptacle. A removable cover cap base 48 is provided with a friction tight flange 50 having a slot 52 adapted to be

aligned with a slot, not shown, but at the lower end of the cable compartment 26 so that the cable can extend outwardly therethrough and the bottom cap 48 can serve as base for the support of the bottle on a table top surface.

The thermos bottle 20 comprises an inner shell 56 open at its upper end and formed of metal or glass and having a bottom wall 58 with an opening 59 therein. The heating coil unit 22 is provided with an external flange 60 and a drop portion 62 depending through the opening 59. The bottom face of the flange 60 is adhered to the top face of the bottom wall 58 in a leak proof manner. Depending from the bottom 58 of the inner shell 56 is a sleeve 64 adapted to be engaged by bottom partition 40 to hold the same in spaced relation thereto and to contain insulating material 66 disposed between the inner shell 56 and an outer wall 68 that runs full height of the inner shell and depends substantially below the partition 40 to provide the cable reel compartment 26 and receives the externally tight fitted flange 50 of bottom cap base 48. The bottom partition 40 is removably secured by screws 68 to a flanged ring 69 secured to the inner face of the outer wall 68.

The upper end of the outer wall 68 is mounted to provide a threaded portion 70 to receive a cover cap 72 housing a plurality of drinking cups 74. From the threaded portion 70 of the outer wall extends inwardly at 76 over the insulating material 66 and has an upwardly externally threaded portion 78 encompassing and secured to the open end of the inner shell 56. This threaded portion 78 receives an internally threaded closure cap 80 to contain the contents within chamber 82 having the heater unit 22. The cap 80 is preferably removed when heating of the contents in the chamber 82 is being done.

Referring now particularly to FIGS. 2 and 3, the heating unit 22 is provided with an inner porcelain or insulating wall 84 on which an upper coil 86 of heavy ampere 12-volt Nichrome wire is disposed providing at its upper end a terminal end 88 connected by a lead 89 depending therefrom and having a terminal 90 adapted to be connected to the pronged terminal 34 on the bottom partition 40. A terminal 92 on the lower end of coil 86 is connected in common with the upper end of a low amperage, 120-volt wire coil 94 on the inner porcelain wall 84 and provided at its lower end with a terminal 96 from which a lead 97 extends with a terminal 98 for connection with the pronged terminal 34.

The common terminal 92 is connected by a lead wire 100 and terminal 101 with the pronged terminal 34 through a thermostatic switch 24 and a lead wire 102 connected with the third terminal of the pronged terminal 34 on the partition wall 40. The heating wire coils 86 and 94 are covered by an external outer porcelain or insulating wall 104 and the heating coils are finally covered by a metal closure cap 106 that engages in a liquid tight manner the top face of the flange 60 of the heater unit.

The heater unit has depending from its lower end a threaded mounting stud 108 that depends through the center of the partition 40 for the connection thereto of the cable reel stem 30. The thermostatic switch 24 is carried upon the depending threaded stud 108 and is held in close engagement therewith to receive heat from the stud and heater unit 22 by an L-shaped bracket 110 carried on the stud 108 and adapted to force the thermostat into heat transfer engagement with the underface of the heater drop portion 62 by a threaded nut 112 screwed upwardly on the stud 108.

The cable reel 28 comprises a top plate 114 and a bottom plate 116 held together by circumferentially-spaced rods 118 and a central sleeve 120 that is slidable and rotatable upon the stem 30. The top plate 114 carries the plug receptacle 32 with its three openings therein for receiving the pronged terminals of the lug 34 carried by the bottom partition 40. The cable 39 is connected to the plug receptacle 32 at 124 and can be wound upon the spacing rods 118 and between the top and bottom plates 114 of the reel 116 as the reel 28 is turned by its handles 36 and 38. This rotation of the reel is effected when the reel is pulled downwardly against the screw stop 46 on the stem 30 with the cable 122 aligned with the slot in the lower end of the outer casing 68 and the slot 52 in the cover base 48. After the cable 39 has been released for connection with a current-supply receptacle, the reel 28 is thrust inwardly to connect the receptacle 32 of the reel with the pronged terminal 34 and the depending polarizing stop 42 in the slot 44 in the top plate 114 of the reel 28.

In order that the cable 122 can be connected with either a vehicle cigar lighter receptacle or a household wall receptacle, a special multiple-type plug 126 has been provided. This plug is provided with a cigar lighter plug formation 128 having a single center contact projection 130 and a side spring contact 132 and angled therefrom is a wall receptacle projection 134 having depending contact prongs 136 and 138.

In order that these contacts that are not being used, yet bearing current, are not exposed when the plug is connected to its receptacle, a generally triangular-shaped guard 140 of plastic has the plug 126 pivotally connected to pins 142 and 144 extending respectively through holes 146, 146 at the opposite sides of the guard 140. The pins 142, 144 preferably tightly fit the holes, 146, 146 in order that the multiple plug 126 will be frictionally and firmly held in its adjusted position relative to the guard 140. The cable 122 passes through an elongated slot 148 in an arcuate end closure 150 having laterally extending wing extensions 152, 153. The outer end of the guard 140 is closed by an arcuate wall 154 which prevents access to the outer ends of the contact terminals of the plug 126. As shown in FIG. 5, the plug 126 is adjusted relative to the guard 140 to expose the vehicle lighter receptacle in the dashboard of the vehicle. When the plug 126 is pivoted so that the portion is within the guard 140 the pronged household plug projection 134 is exposed for engagement with the wall receptacle in the household.

Referring now to FIGS. 9 to 12, there is shown a modified form of the invention in which the reel is dispensed with and wherein a cable 160 having a plug 162 adapted for insertion in a vehicle dashboard cigar lighter receptacle on end end and on the other end of the cable a pronged plug terminal 164 adapted for insertion in a household wall receptacle.

The threaded stem 108 depends from the heater unit 22 and through a sleeve 165 that depends through bottom partition 40' for connection thereto of an especially-formed double plug receptacle 166. The sleeve 165 has an inwardly turned flange 165' on its lower end against which a flange 166' on the receptacle is forced as the receptacle threaded on the stem 108, the receptacle having a threaded opening for receiving the same. The cable 160 can be coiled and placed into the compartment 26 and held therein by the cover base 48 tightly fitted by its flange 50 into the open end of the outer wall 68.

The special receptacle 166 has a lead 88' connected to a terminal 168 within the receptacle 166 and the terminal lead 96' from the high voltage heating coil 94 is connected to a central terminal 170 in the receptacle 166. A common lead 100' extends through a thermostatic switch 24 which is connected by a lead wire 172 that is connected to a U-shaped terminal 174 and a ring terminal 176. The terminals 168 and 174 receive prongs 178 and 180 of terminal 164 of the cable 160.

As shown in FIG. 11, when the plug terminal 162 is inserted into the double plug receptacle 166, central and ring terminals 182 and 184 will respectively engage receptacle central terminal 170 and ring terminal 176 to deliver when the pronged plug 162 is inserted into a household receptacle, alternating household current to the high voltage heating coil 94.

Referring now to FIGS. 13 to 15, there is shown a further modified form of the invention wherein the leads from the heating coils are respectively extended to vehicle lighter and pronged receptacles 190 and 192 carried by a bottom partition 40'. The plug receptacle 190 has laterally extending lugs 194 and 196 that are secured by screws 198 and 200 to the plate 40' to hold receptacle 190 in place therein. The receptacle 190 is that of a vehicle lighter receptacle and has a contact ring 202 and a central contact sleeve 204 respectively connected by leads 206 and 208 through thermostatic switch 24 to high voltage heating coil 94. With the plug 164 secured to

household wall receptacle, alternating electric current will be delivered to the heater coil **94**.

The pronged plug receptacle **192** has side projections **210** and **212** that are connected by respective screws **214** and **216** to the bottom partition **40'** to retain the receptacle **192** thereon. A nut **217** is secured to the bottom partition **40'** for securement of partition **40'** to stem **108** of the heater unit **22** to retain the heater unit in place.

This receptacle **192** has U-shaped contacts **218** and **220** for respectively receiving prongs **178** and **180** of the terminal plug **164** on cable **160**. The U-shaped contact **218** is connected by lead **222** to common wire **206**, thermostat switch **24** and central lead **100'** to terminal end **92** of low voltage coil **86** while contact terminal **220** of receptacle **192** is connected by wire **224** to terminal end **88** of low voltage coil **86**. Thus, upon plug **162** being secured to a vehicle lighter receptacle and the pronged plug **164** connected to the receptacle **192**, electric current from the vehicle battery will be supplied to the low voltage heater coil **86**.

The cable **160** having the different plugs **162** and **164** can be used, like with the form shown in FIGS. **9** to **12**, by simply removing the cover base **48** and taking the cable from the compartment **26** and make the connection of the plugs as desired to the available electric receptacles. The cover base **48** can be refitted to close the compartment while the cable **160** extends therefrom through slots **52** shown in FIG. **1** and support the bottle upon a table top surface.

We claim:

1. A self-heated hermetically sealed thermos bottle comprising an inner shell having a bottom wall and a removable closure cap closing the open upper end thereof, an outer casing extending about the shell and heat insulated therefrom, a cover cap removably fitted to the open upper end of the outer casing, an electric heater unit resting on the bottom wall of the inner shell and depending therethrough, said outer casing having a bottom compartment, a cover base removably fitted to the open end of the bottom compartment to close the same and serve as a support for the thermos bottle upon a top surface, a bottom partition secured in spaced relation from the bottom wall of the inner shell within the outer casing, electric plug means carried by the bottom partition and wired in circuitry with the heater unit, and a cable cord having plug terminals on the opposite ends of the cable, at least one said plug terminal being detachable from the electric plug carried upon the bottom partition and within the compartment.

2. A self-heated thermos bottle as defined in claim **1**, and a threaded stem depending from the heater unit, and means threaded upon the stem and engaging the partition to hold the heater unit in place upon the bottom of the inner shell and the partition thereagainst.

3. A self-heated thermos bottle as defined in claim **2**, and a cable reel mounted for rotation upon the depending stem of the heater unit, said reel carrying one plug of the cable and rotatable and axially adjustable upon the stem for engagement with and disengagement from the electric plug means carried by the bottom partition wall.

4. A self-heated thermos bottle as defined in claim **3**, and said bottom partition having a depending polarizing and centering projection for the cable reel to align the plug terminals carried by the bottom partition and the reel, said cable reel having a recess for receiving the polarizing and centering projection.

5. A self-heated thermos bottle as defined in claim **1**, and a thermostatic switch and means for securing the same to said stem and in heat exchange relationship with the heater unit.

6. A self-heated thermos bottle as defined in claim **1**, and said heater unit having low and high voltage heating coils and wired to said electric plug means to include a common cable wire to fit the other of the cable plug terminals having one projection with terminals for fitting a vehicle cigar lighter receptacle and another plug projection having terminals for fitting a household receptacle.

7. A self-heated thermos bottle as defined in claim **6**, and a guard pivotally connected to the plug and adapted to enclose either plug projection when not in use.

8. A self-heated thermos bottle as defined in claim **2**, and said electric plug means being in the form of a solitary plug adapted to receive either a cigar lighter plug or a pronged terminal plug, said solitary plug being threaded upon the depending stem of the heater unit and serving as the holder means to tighten the heater unit onto the bottom wall of the inner shell by tight engagement with the bottom partition.

9. A self-heated thermos bottle as defined in claim **7**, said heater unit having low and high voltage heater coils and said plug receptacle mounted on the heater stem having pairs of terminal contacts wired to the different heating coils to conduct either battery current or household current to one or the other of the heating coils.

10. A self-heated thermos bottle as defined in claim **1**, and said bottom partition carrying two separate types of receptacles, said heating unit having low and high voltage heater coils separately wired respectively to the different plug type receptacles on the bottom partition.