

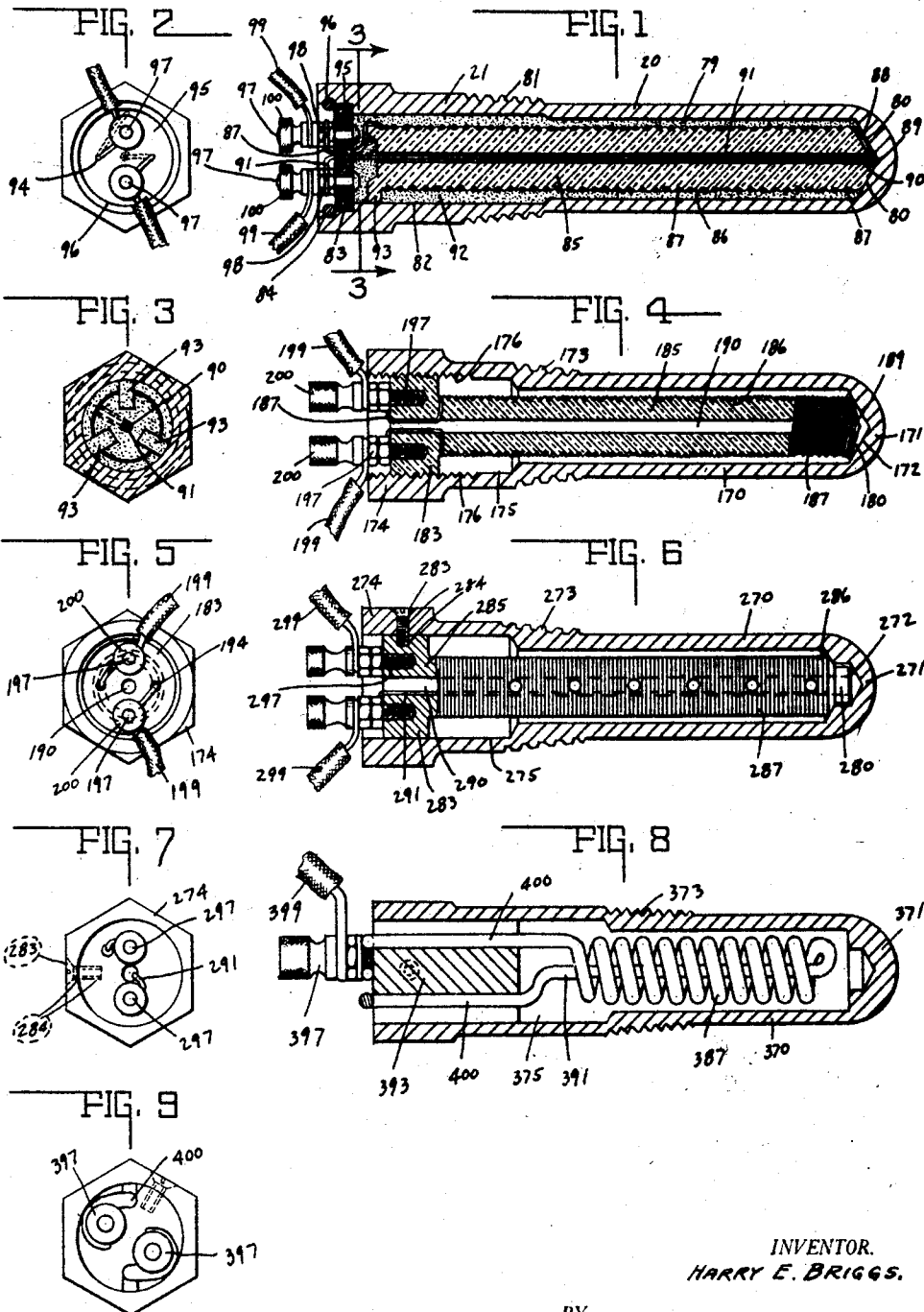
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ELECTRICALLY HEATED IGNITER

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ELECTRICALLY-HEATED IGNITER.

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This invention relates to an igniter for oil engines.

The chief object of the invention is to provide an igniter for heating the fuel supplied to an oil engine particularly when starting the same to insure ignition of the combustible mixture, and at the same time so construct the igniter that the heat generating portions are adequately protected from the excessive pressure, heat, or strains resultant in an oil engine.

The chief feature of the invention consists in the formation of an igniter from a heat resistant, heat transferring metal casing enclosing and protecting a heating element, which heating element may or may not be suitably supported within said casing by suitable insulation.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

In the drawings Fig. 1 is a longitudinal sectional view of one form of heating plug. Fig. 2 is an end view of the same. Fig. 3 is a transverse sectional view taken on line 3—3 of Fig. 1 and in the direction of the arrows. Fig. 4 is a longitudinal sectional view of another form of heating plug. Fig. 5 is an end view of the same. Fig. 6 is a longitudinal sectional view of a still further form of heating plug. Fig. 7 is an end view thereof. Fig. 8 is a longitudinal sectional view of still a further form of heating plug. Fig. 9 is an end view of the same.

The invention disclosed herein is a division in part of that disclosed in co-pending application Serial No. 619,616, filed February 17, 1923, entitled "Heater system for oil engines" and the invention as disclosed in Figs. 1 to 5 inclusive, is the same as disclosed in Figs. 11 to 13 and 16 and 17 of the before mentioned copending application. Additional modified forms of the invention are shown in Figs. 6 to 9 inclusive.

In Figs. 1, 2 and 3 there is illustrated one form of the heater plug. The plug 20 is hollowed out as at 79 and a seat 80 is provided at the closed end of said hollowed out portion. The enlarged body portion 21 has an externally tapered and threaded portion 81, whereby said plug is rigidly secured in a cylinder head opening. The body portion

is cut away as at 82 and 83 and grooved as at 84 adjacent to the enlarged opening 83. Extending axially through the hollowed body is an insulating core 85 which is adapted to stand up under high temperatures, particularly within the range of 500 to 1500 degrees Fahrenheit. The commercial product "lava" satisfies this condition and will approximately withstand 2000 degrees before disintegrating. The surface 86 of core 85 is threaded, and positioned in said threads, is a wire 87 which constitutes a resistance unit. Said wire terminates adjacent the free end in a lead portion 88 positioned in a slot 89 which communicates with an axial hole 90 through the insulator body portion 85 and the axial opening 90 receives the connection 91. The space between the core carrying the resistance unit and the wall of the chambers 79—82 is herein shown filled with an insulating compound 92. The end of the core 85 opposite from the slotted end 89 is herein illustrated as provided with three projecting portions 93 which are receivable by the chamber 82 and serve to center the outer end of the core 85, whereas the other end of the core 85 is centered by reason of the conical end 80. The wire 87 and the lead 91 are brought out through the holes 94, see Fig. 2, cut in an insulating plug or disk 95 seated in the enlarged portion 83 of the axial opening in the plug body. The insulated disk or plate 95 is retained in position by means of the spring clip ring 96 seated in the groove 84. The disk 95 supports a pair of terminal posts 97 and these each are secured to one of the heating unit terminal wires 87 or 91 by means of the nut 98 while the external connector 99 is secured to said terminal post or stud 97 by means of the thumb nut 100. The metallic body portion of each of the plugs hereinafter to be described and the plug previously described, is preferably formed of metal having particular properties, such as low specific heat and high resistance to conduction of heat. This has been found to be the most desirable in a heating unit which is subjected to the high temperatures found in a crude oil engine when the latter is operating.

In Figs. 4 and 5 there is illustrated a further and modified form of heater plug; and

herein the plug body comprises a tubular portion 170 having a closed end 171 with a conical seat 172 therein. The tubular portion 170 at its opposite end terminates in an externally threaded and tapered portion 173, which is enlarged at 174 to form a tool receiving portion and herein said portion 174 is shown as hexagonal in form. The portions 173 and 174 are hollowed out at 175 and internally threaded as at 176. Extending axially through the hollowed body is an insulating core 185 which is adapted to stand up under high temperatures as aforesaid. The surface 186 of the core is externally threaded and differs from the portion 86 previously described, in that it has a double thread. The wire 187 is positioned in one of said threads and runs from one end of the thread to the opposite end, and thereupon passes through the core by passing through the opening 189 which provides a communication from one of the threads to the other thread. The wire 187 thus passes down one thread and returns up the other thread. The end of the core 185 opposite the conical end 180 is enlarged at 183 and is threaded externally so as to be receivable by the threads 176 of the plug wall. Thus the core at this end is centered within the tubular heater body, while the other end of the core is centered by reason of the conical end 180 engaging the conical portion 172 of the plug body. The wire 187 is brought out through the openings 194 in the enlarged portion 183, which supports a pair of terminal posts 197 having a threaded engagement therewith. Said posts support the nuts 198 for securing the terminal ends of the wire 187 thereto. The thumb nuts 200 are adapted to secure the external connectors 199 to the terminal posts. Herein the core is shown centrally apertured but if desired this longitudinal opening 190 may be omitted.

In Figs. 6 and 7 a modified form of the invention is illustrated, in which form the body portion 270 is hollowed out and includes a smaller chamber 272 in the closed end 271. The insulation core or support 285 includes a central axial opening 290 receiving the lead in wire 291. Said lead in wire extends downwardly through the central opening and is positioned in the coils 287 upon the threaded surface 286 of the insulation core 285. The end 280 of the core 285 is receivable by the chamber 272 for centering purposes, the conical faces of the chamber and the extension seating for centering purposes. The opposite end of the core is enlarged as at 293 and said core is retained in position by a tapered screw 283 seatable in the registering openings 284 formed in the body 274 and core 285. The plug as usual is provided with a tapered external thread and a tool engageable portion 274. The wire terminals 297 are employed for

supporting the external wires 299 and for connecting the same to the heat resisting coil 287.

The type shown in Figs. 1 to 7 inclusive, are of the relatively high voltage type, that is suitable for 110 and 220 volts pressure. The type shown in Figs. 8 and 9 is of the low voltage type and as a consequence the resistance unit is of a more rugged construction than that shown in Figs. 1 to 6 and therefore does not have to be supported. The same core can be utilized. In this form of the invention the longitudinal lead in wire 391 forms a central support or stiffener for the concentric coils 387 of the resistance unit. The terminal portions 400 are suitably supported in an insulation block 393 suitably secured in the chamber 375 formed within the plug having the tapered external thread 373 upon the body portion 370. The end 371 of the plug is closed as in the other forms. The insulation block or plug 393 supports the usual terminal construction indicated generally by the numeral 397 and the supply lines 399.

The invention claimed is:

1. A heater comprising a metallic hollow body having a low specific heat and high resistance to heat conductivity, and a lava insulating core within the hollow body, and electric heating means supported by said core within said body.
2. A hollow metal body closed at one end, an insulation core positioned in said hollow metal body and supported at one end therein by the closed end of said body and supported and retained within said body at the other end thereof, said core having a threaded periphery, and electric heating means positioned on said core in said threaded portion.
3. An igniter for an oil engine comprising a hollow metal plug having a tool engageable portion at one end and an externally threaded portion adjacent thereto and a closed opposite end, a resistance coil positioned within said body, and an insulation block oppositely positioned from the closed end for supporting the terminal portions of said resistance coil.
4. An igniter for an oil engine comprising a hollow plug for an oil engine comprising a hollow plug body having a tool engageable portion at one end, a threaded portion adjacent thereto and a closed opposite end, a resistance coil within the plug body, and an insulation core for supporting said coil and having one end associated with the closed end of the body for centering said insulation core, said core having an enlargement upon the opposite end for centering the other end thereof.

In witness whereof, I have hereunto affixed my signature.

HARRY E. BRIGGS.