Dec. 25, 1923. 1,478,415

E. L. WIEGAND

HEATER FOR INTERNAL COMBUSTION ENGINES

Filed Sept. 29, 1921

FIG. 1.

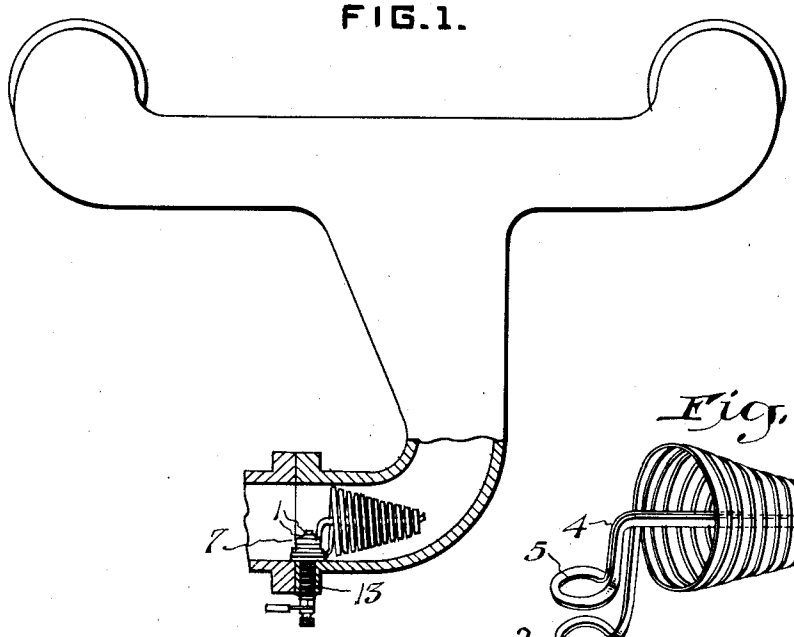


Fig. 5.

FIG. 2.

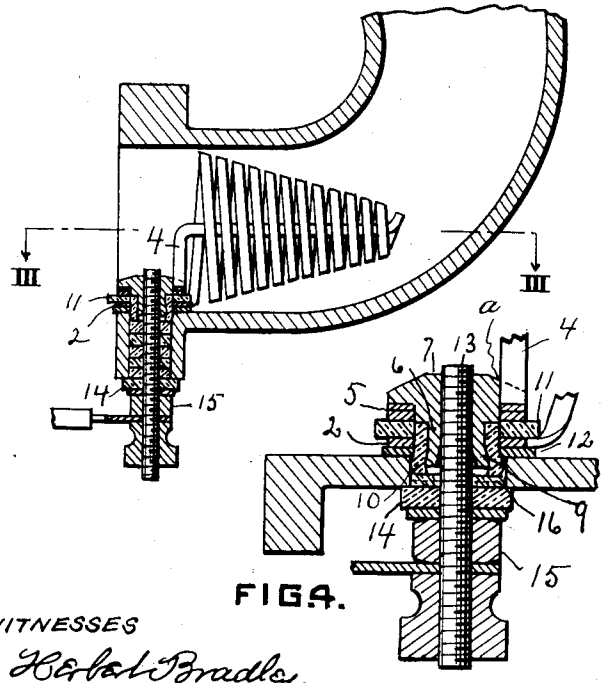


FIG. 3.

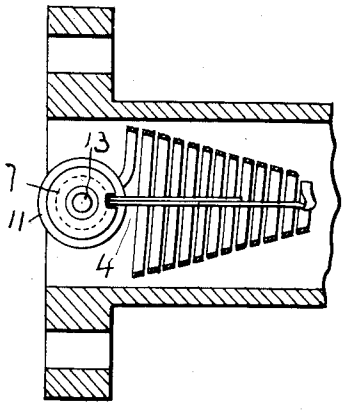


FIG. 4.

WITNESSES

J. Herbert Bradley.

INVENTOR

Edwin L. Wiegand

by Dennis S. Wolcott

Atty

Patented Dec. 25, 1923. 1,478,415

UNITED STATES PATENT OFFICE.

EDWIN L. WIEGAND, OF PITTSBURGH, PENNSYLVANIA.

HEATER FOR INTERNAL-COMBUSTION ENGINES.

Application filed September 29, 1921. Serial No. 504,089.

To all whom it may concern:

Be it known that I, EDWIN L. WIEGAND, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Heaters for Internal-Combustion Engines, of which improvements the following is a specification.

In an application filed July 2, 1920, Serial Number 393,552, I have described and shown an electrically operated heater for vaporizing combustible fluids just prior to their entrance into the engines of automobiles or other internal combustion engines. The invention described herein relates to the manner of mounting such type of heater in the conduit conducting the combustible fluid to the engine and is hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification, Fig. 1 is a view partly in elevation and partly in section showing the heater in position in a conduit leading to the manifold of an automobile engine; Fig. 2 is a sectional detail view on an enlarged scale, showing the heater in position; Fig. 3 is a sectional view taken on a plane indicated by the line III—III, Fig. 2; Fig. 4 is a sectional view on an enlarged scale illustrating the manner of constructing and arranging the terminal of the heater and Fig. 5 is a detailed view on a large scale showing the heating coil and the eyes forming the terminals thereof.

While the invention described and claimed herein is not limited to the use of any particular construction of heater, it is shown in connection with the form of heater shown and described in the application above referred to and consists of a narrow strip of metal coiled to form a conical helix. The end of the strip of metal at the base or larger end of the helix is bent to form an eye or loop 2. The other end of the strip extends down through the helix and is bent to form a radial portion 4 extending a short distance beyond the base of the helix and the portion extending beyond the helix is bent to form a loop or eye 5 in a plane substantially parallel with the axis of the conduit and the helix which is arranged longitudinally of the conduit, and through the eye 5 is passed the hub or reduced portion 6 of a nut 7, the head of which is notched or cut away as at *a* for the reception of portion 4 of the strip of metal. The nut is provided beyond this reduced portion with a tubular extension 9 on which is placed a sleeve 10 formed of insulating material preferably indurated fibre. A washer 11 formed of insulating material preferably mica, is slipped on the sleeve and against the terminal eye 5. As the sleeve has an external diameter equal to that of the portion 6 of the nut, the mica washer will, when subjected to pressure as hereinafter described, be forced against the eye 5 and the latter against the head of the nut thereby ensuring good electrical contact between the nut and eye. The eye 2 is next placed on the sleeve 10 and against the mica washer, which will prevent any short circuit between the eyes 2 and 5 while the insulating sleeve 10 will insulate the eye 2 from the tubular extension 9. A metal washer 12 is next placed on the sleeve 10 and in contact with the eye 2 and in order that this washer may form a good connection between the eye 2 and the conduit, to which is connected one terminal of the generator employed for heating the helix, the underside of the washer is curved to correspond with the curvature of the conduit. After the above mentioned parts have been assembled as described, the outer end of the tubular extension is flared out thereby enlarging the end of the sleeve 10 and securing the several parts in proper position on the nut, and the latter to the terminals of the helix. The helix is then placed in the conduit and the outer portions of the tubular extension 9 and the sleeve 10 inserted in an opening through the wall of the conduit and a threaded rod 13 is then passed into the opening in the conduit and screwed into the nut 7. A comparatively thick insulating washer 14 preferably formed to effect a closure is then slipped onto the rod 13 and a nut 15 screwed against this washer, which being of larger diameter than the nut and the hole in the conduit, will effectually insulate the nut from the conduit. By screwing the nut 15 tightly against the washer 14 the metal washer 12 will be pressed firmly against the inner wall of the conduit and the several members carried by the nut 7 will be pressed tightly together. If desired, washer 16 of insulating material may be placed between the end of the insulating sleeve 10 and the washer 14 but such washer should not be so thick as to prevent such movement of

the sleeve into the opening in the conduit as is necessary to ensure contact of the several parts carried by the nut 7.

When the wall of the conduit is thick or the opening for the reception of the parts carried by the nut is forced through the flange on the end of the conduit, the space intermediate the end of the sleeve 10 and the washer 14 may be filled with washers of insulating material as shown in Fig. 2.

It is characteristic of the construction described and shown herein that all of the parts which are to be placed within the conduit are tied together, and that the nut 7 and parts carried thereby project only a small distance beyond the largest coil of the helix and hence only a slight flexure of the axial terminal of the helix will be required in placing the device in position.

I claim herein as my invention—

1. The combination of a nut having a tubular extension, a heating coil having one of its terminals mechanically and electrically connected to the nut, an insulating sleeve secured upon the extension, an eye forming the other terminal of the coil secured on said sleeve.

2. The combination of a nut having a reduced portion and a tubular extension, a heating coil having eyes as its terminals, one of said eyes enclosing the reduced portion of the nut, a sleeve of insulating material surrounding the tubular extension and surrounded by the other terminal eye, a washer of insulating material interposed between the two eyes, a metal washer fitting on the sleeve and bearing against the terminal carried thereby, the end of the tubular extension being flared to hold the several parts in position on the nut.

3. The combination of a conduit having an opening in its wall, a nut, a heating coil having one terminal electrically connected to the nut and its other terminal mechanically secured to the nut but electrically insulated therefrom and adapted to be electrically connected to the inner surface of the conduit and a threaded stem passing through the opening in the conduit, but out of contact with the wall of the opening, and engaging the nut, a nut screwing onto the stem and an insulated washer interposed between the exterior nut and pipe.

In testimony whereof, I have hereunto set my hand.

EDWIN L. WIEGAND.