

April 19, 1927.

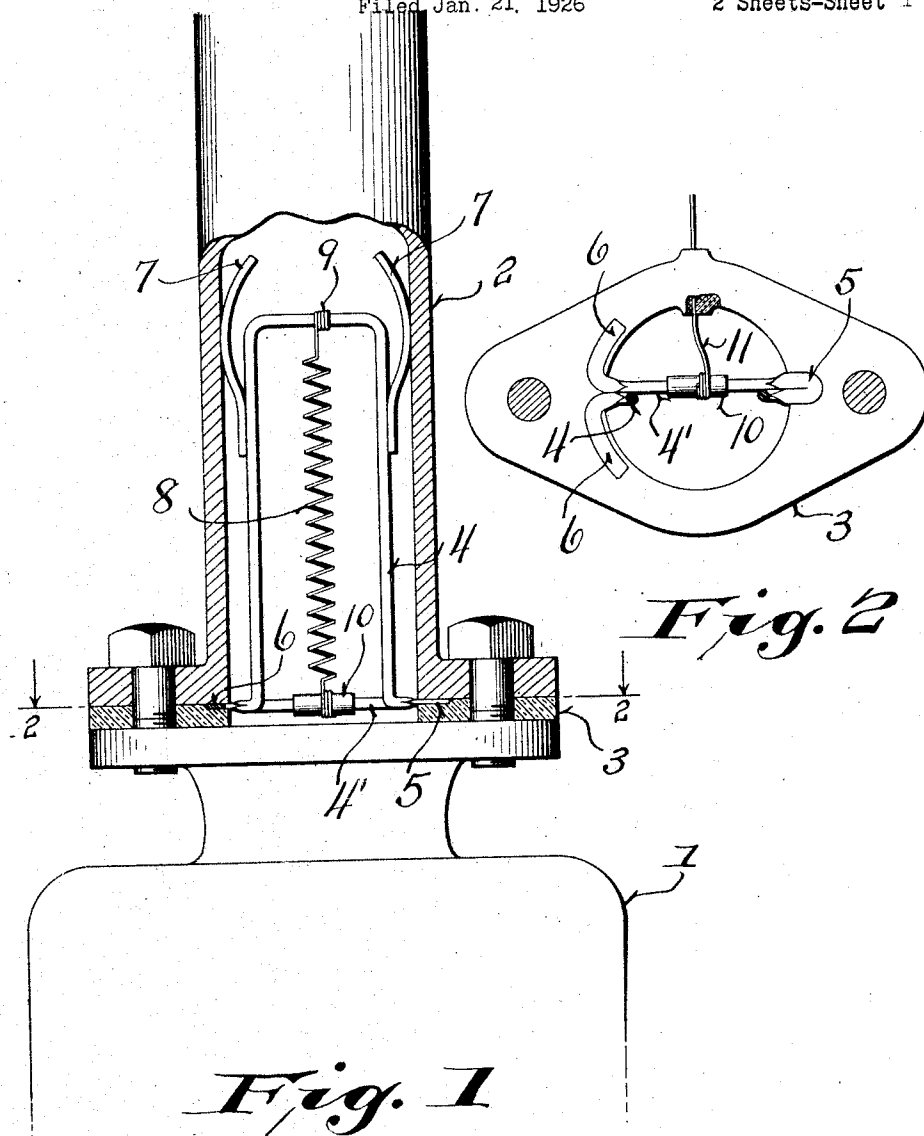
W. BESSER

1,625,448

MANIFOLD ELECTRIC HEATER

Filed Jan. 21, 1926

2 Sheets-Sheet 1



Inventor:
William Besser
By *[Signature]*
Attorneys

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Fig. 3

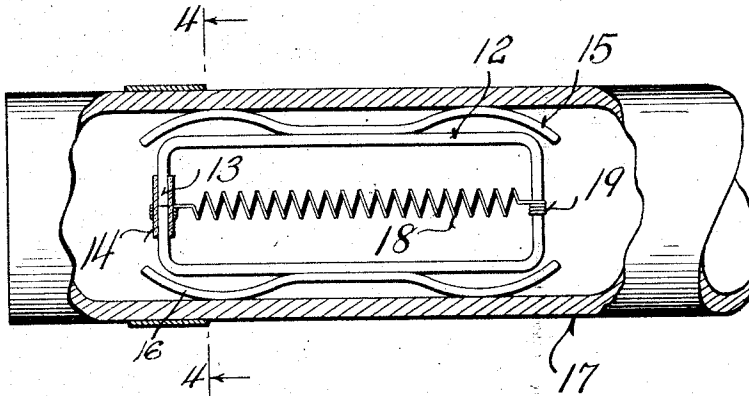


Fig. 4

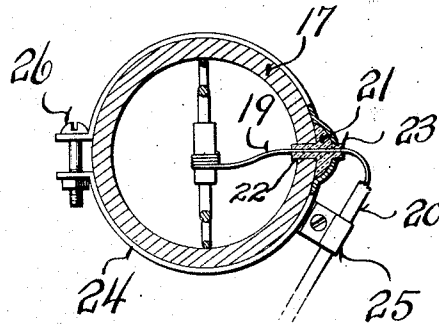
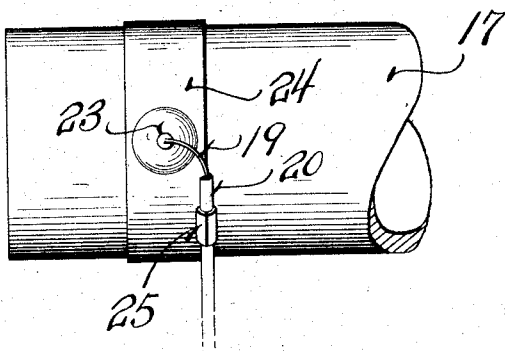


Fig. 5



Inventor:
William Besser
By *[Signature]*
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM BESSER, OF WAUWATOSA, WISCONSIN.

MANIFOLD ELECTRIC HEATER.

Application filed January 21, 1926. Serial No. 82,727.

This invention relates to manifold electric heaters, and is particularly directed to a unit adapted for positioning within the manifold of an internal combustion engine.

It is well known that in starting internal combustion engines, difficulty is frequently had due to the inability to vaporize the gasoline and also due to the fact that the gasoline picked up by the air is not sufficiently broken up to insure instantaneous ignition. These defects are at all times present in gasoline engines, but are emphasized to a marked degree during cold weather.

This invention is designed to overcome the above noted defects, and objects of such invention are to provide an electric manifold heater which will insure the intimate mixing of the gasoline and air due to the heating of the air or of the mixture in such a manner that the gasoline will be thoroughly vaporized prior to its arrival at the cylinders, and also to provide a heater which will warm the intake manifold of the engine and prevent condensation of the fuel along the manifold.

Further objects are to provide an extremely simple type of electric manifold heater which may be made as a unit and slipped into the manifold or into the air intake pipe leading to the carburetor so that the air or mixture may be warmed, and thus insure easy starting.

Further objects are to provide a very simple type of unit which may be cheaply manufactured, and which may be readily positioned in the ordinary types of manifolds.

Embodiments of the invention are shown in the accompanying drawings, in which:—

Figure 1 is a view of a portion of the intake manifold adjacent the carburetor, such view being partly in section.

Figure 2 is a sectional view on the line 2—2 of Figure 1.

Figure 3 is a sectional view through the intake air pipe.

Figure 4 is a transverse view on the line 4—4 of Figure 3.

Figure 5 is a side elevation of the structure shown in Figure 4.

Referring to the first form of the invention shown in Figures 1 and 2, it will be seen that the carburetor 1 is bolted to the intake manifold 2 and that a suitable insulating gasket 3 is interposed between the flanges of these members.

The heating unit comprises a rectangular

relatively heavy wire frame 4 which is provided with elongated side members spaced from the inner walls of the manifold 2, and which has outwardly projecting ears 5 and 6. The ears 6 are preferably formed with laterally projecting portions, as shown most clearly in Figure 2, so as to insure the utmost rigidity of the unit. Further it is to be noted that the supporting frame 4 may be formed of a single piece of heavy wire to thus materially simplify the construction.

If desired, the outer end of the unit may be provided with a pair of curved spring arms 7 which contact with the inner walls of the manifold 2 and thus aid in holding the unit against lateral vibration. Further this unit is securely held by the clamping action of the gasket against the flange of the intake manifold, such gasket being suitably depressed at the ears 5 and 6, as indicated in Figure 1.

The heating element itself is indicated at 8 and comprises any suitable form of resistance wire, one end of which is wrapped, as indicated at 9, about the outer end of the rectangular frame 4. The other end of this heating unit, which may be in the form of a spiral, is wound about an insulating sleeve 10 positioned upon the forward transverse member 4' of the supporting frame 4. Thus one end of the heating unit is ground to the frame and from thence to the intake manifold. The other end 11 continues outwardly from the innermost end of the heating unit adjacent the sleeve 10 and extends through the insulating gasket 3, as shown most clearly in Figure 2. This end of the heating unit is connected to any suitable type of control switch, and from thence to the battery in the usual manner.

In the forms shown in Figures 3 to 5, substantially the same construction of heating unit is employed. However, in this form, the supporting frame 12 has its ends 13 brought into juxtaposition and slipped into the insulating retaining sleeve 14, as most clearly shown in Figure 3. This frame is provided with spring arms 15 and 16 adjacent opposite ends which clamp against the inner surface of the manifold or intake air pipe 17, and thus retain the heating unit in place. The heating element itself is similar to that previously described and consists of a helix 18 of resistance wire, one end of which is wrapped, as indicated at 19,

about the frame 12, and is thus grounded. The other end is wrapped about the insulating sleeve 14 and extends outwardly, as indicated at 19 in Figure 4. This outwardly extending portion passes through an insulating bushing or button and is connected to a suitable insulated conductor 20.

In this construction, the insulating button is indicated at 21 and has a spherical outer projecting portion, and has also a cylindrical inwardly projecting portion 22 which passes through a hole in the air pipe 17. It is also provided with an outwardly projecting relatively short cylindrical portion 23. A retaining clamping strap 24 surrounds the air pipe 17 and is bulged outwardly to receive the body 21 of the insulating bushing. It is apertured to receive the collar 23 of such bushing, as shown in Figures 4 and 5. Further this clamping sleeve is provided with a clip 25 which holds the insulated feed wire 20 in position, and thus relieves the extension 19 or conductor from the heating element from strain. The clamping sleeve 24 may have its ends joined together by means of a suitable bolt 26, as shown in Figure 4.

From the description of the two forms of the invention, it will be apparent that a very simple and serviceable type of heating unit has been provided which may be readily applied to existing types of manifolds, and may be positioned wherever found most expedient, either in the portion of the manifold in advance of the carburetor or in the portion thereof past the carburetor.

It is, therefore, intended that in the claims the term manifold shall be understood as including both portions of the intake system of the internal combustion engine, whether it be the inlet air pipe, or whether it be the portion of the manifold between the carburetor and the cylinders.

It will be seen further that the actual construction of the heating unit is extremely simple and may thus be very cheaply manufactured and placed on the market at a very small cost.

It is to be understood that the heating unit may be left in place in the manifold and may be used only when actually needed. For instance in cold weather the current may be turned on for a short period prior to starting and during the actual starting period. After the engine becomes warmed up and the manifold is sufficiently heated, the current is cut off as it is no longer needed.

Although the invention has been described in considerable detail, such description is intended as illustrative rather than limiting as the invention may be variously embodied and as the scope of such invention is to be determined as claimed.

I claim:

1. A heating element for the intake manifold of an internal combustion engine comprising a rectangular relatively rigid wire frame having outwardly projecting spring arms adapted to contact with the interior of the manifold, an insulating sleeve carried by one portion of said frame, a heating element having one end secured to said insulating sleeve and having its other end grounded upon said frame at a portion spaced from said sleeve, said element having an outwardly extending part projecting from said sleeve, and an insulated member surrounding said outwardly projecting portion and preventing contact thereof with said manifold.

2. A heating element for the intake manifold of an internal combustion engine comprising a relatively rigid wire frame adapted for positioning within the manifold and having at one end an insulating portion, an insulating gasket associated with said frame and adapted to be clamped to the intake manifold, a heating element carried by said frame and said insulating portion and extending laterally from said manifold through said insulating gasket.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee and State of Wisconsin.

WILLIAM BESSER.