

June 1, 1943.

B. LOEFFLER ET AL

2,320,528

HEATER FOR ENGINE MANIFOLDS

Original Filed Nov. 22, 1939

2 Sheets-Sheet 1

Fig. 1.

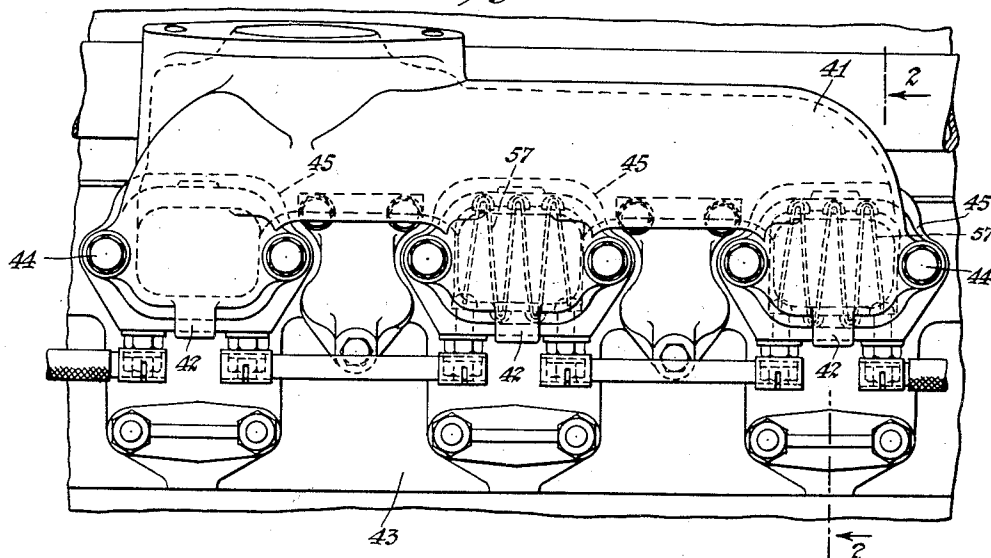
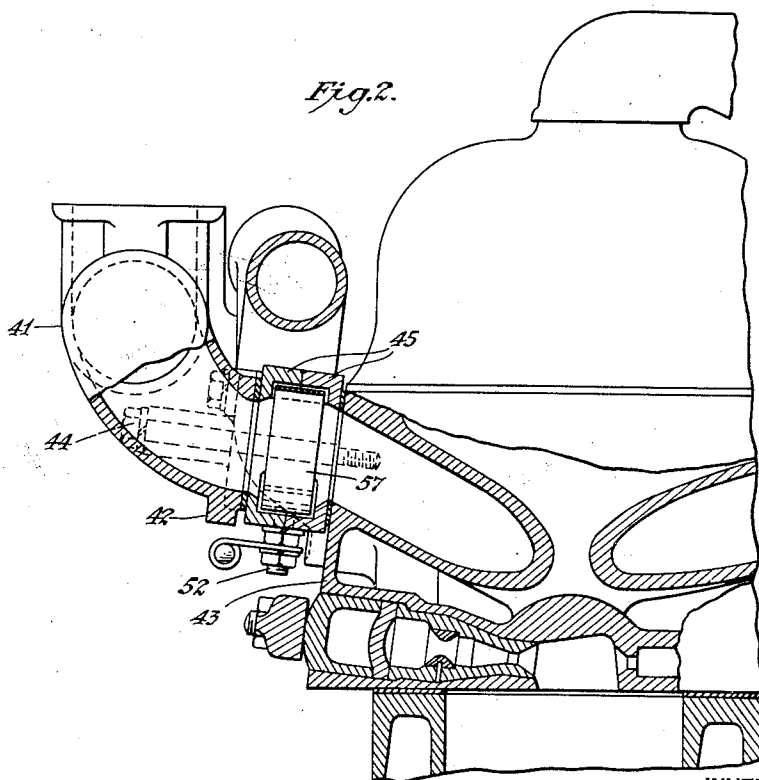


Fig. 2.



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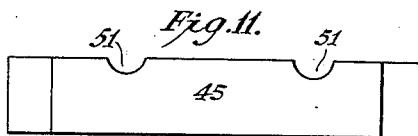
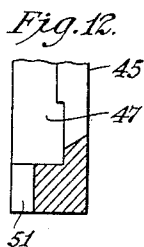
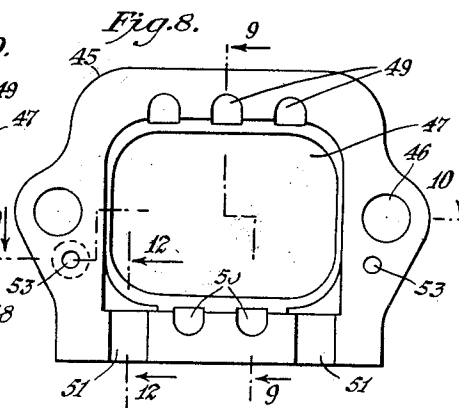
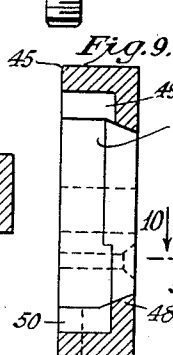
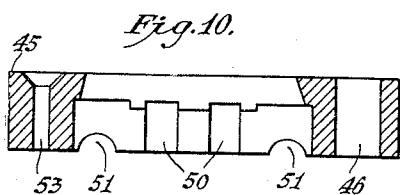
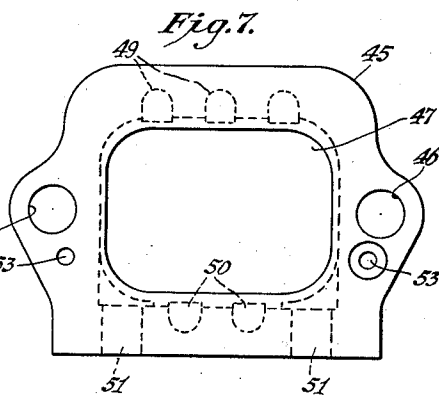
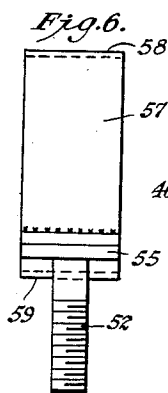
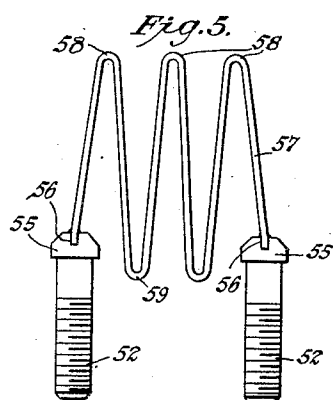
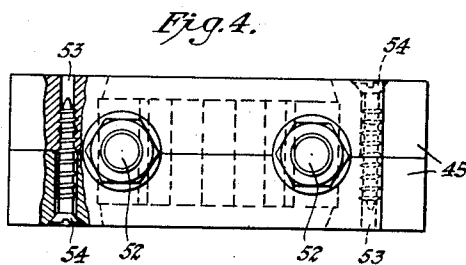
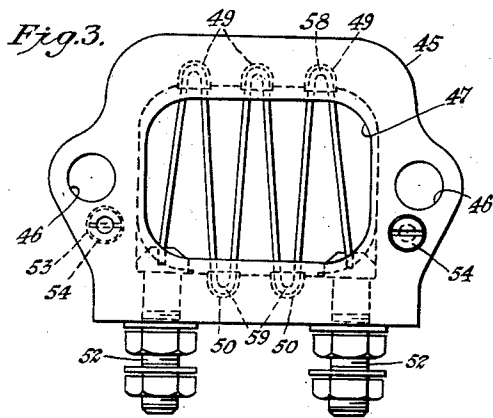
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UNITED STATES PATENT OFFICE

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HEATER FOR ENGINE MANIFOLDS

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Original application November 22, 1939, Serial No. 305,604. Divided and this application May 29, 1941, Serial No. 395,702

2 Claims. (Cl. 219—38)

The present invention relates to manifold heaters and internal combustion engines and embodies, more specifically, an electrical heater for engine manifolds wherein the heating element is of improved form, not only to provide effective heating but to facilitate service.

The present application is a division of applicants' copending application Serial No. 305,604, filed November 22, 1939, for "Manifold heaters and control circuits for the same," and relates particularly to the manifold heater above referred to.

An object of the invention is to provide, in a manifold heater, an improved structure that increases the heating efficiency of the mechanism.

A further object of the invention is to provide a heater of the above character which is capable of being readily serviced and is of such structure that it does not easily fall into disrepair.

A further object of the invention is to provide a heater of the above character which is readily assembled and disassembled and is inexpensive to manufacture and service.

Further objects of the invention will be apparent as it is described in greater detail in connection with the accompanying drawings, wherein:

Fig. 1 is a view in front elevation showing an inlet manifold with heaters installed in accordance with the present invention.

Fig. 2 is a view in section, taken on the line 2—2 of Fig. 1.

Fig. 3 is a view in front elevation of a manifold heater constructed in accordance with the present invention.

Fig. 4 is a bottom view of the device shown in Fig. 3.

Fig. 5 is a view in front elevation of the heater element shown in Fig. 3.

Fig. 6 is an end view of the heater element of Fig. 5.

Fig. 7 is a view in front elevation showing one-half of the heater element insulator of the present invention.

Fig. 8 is a view in rear elevation of the insulator element shown in Fig. 7.

Fig. 9 is a view in section taken on line 9—9 of Fig. 8.

Fig. 10 is a view in section taken on line 10—10 of Fig. 8.

Fig. 11 is a bottom view of the device shown in Fig. 8.

Fig. 12 is a view in section taken on line 12—12 of Fig. 8.

The heating mechanism of this invention is mounted in an intake manifold as illustrated in

Figs. 1 and 2, wherein an engine manifold 41 is shown as provided with three ports, each of which is provided with a flange 42. The cylinder heads 43 are formed to receive bolts 44 by means of which the manifold may be mounted in operating position.

Between the flanges 42 and the cylinder heads 43 are mounted the heaters shown in detail in Figs. 3 to 11. These heaters are formed of cooperating insulator elements 45 having apertures 46 through which the bolts 44 pass. The insulator elements are formed with inner openings and also with the ports formed in the cylinder head. The elements 45 are formed with flanges 48 (see Fig. 9) and with recesses 49 and 50 in the top and bottom of the insulator, respectively, the recesses being in staggered relationship as illustrated in Fig. 8.

Recesses 51 are also provided to receive heater posts 52 (Figs. 5 and 6) and holes 53 are provided to receive screws 54 by means of which the elements may be secured in assembled position.

The posts 52 are formed with T heads 55 having slots 56 within which the ends of a heater element 57 are received and secured as by brazing. The element 57 is formed with upper bends 58 and lower bends 59 to engage the respective recesses 49 and 50, thus insuring effective positioning of the element 57 at all times, as shown in Fig. 3.

It will be observed that the insulator elements are all identical and can thus be used interchangeably. The parts of the heater are all simple and inexpensive to manufacture. The heating surface is great with a minimum of restrictions to ingoing air. There are no parts that can shake loose and get into the combustion chamber, and a further advantage is the location close to the cylinder head to avoid loss of heat as the air travels to the cylinder.

The pockets in the insulators and the formation of the heater element are such that the heater element is maintained effectively in position and, if the element does break, it will not fall against a grounded element to cause a short circuit.

While the invention has been described specifically with reference to the accompanying drawings, it is not to be limited save as defined by the appended claims.

We claim:

1. A manifold heater comprising an insulated gasket having a centrally located aperture adapted to be fitted between a manifold and a cylinder head, said gasket being divided in a plane substantially at a right angle to the axis of said

aperture to form two frame members, recesses in the inner periphery of said gasket extending into each of said frame members, a heater element in the form of a ribbon of material having sections spaced apart and extending across said aperture from one side of said gasket to the other with the terminal portions of said sections received in said recesses and having the broad faces of the ribbon extending generally parallel to the axis of the aperture.

2. A manifold heater comprising an insulated gasket having a centrally located aperture adapted to be fitted between a manifold and a cylinderhead, said gasket being divided in a plane

substantially at a right angle to the axis of said aperture to form two frame members, recesses in the inner periphery of said gasket extending into each of said frame members, a heater element 5 formed of a flat band with portions folded back and forth, the portions between the folds being spaced apart and extending across said aperture from one side of said gasket to the other with said folds being received in said recesses, and 10 said portions lying in planes extending axially of said aperture.

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