Jan. 26, 1954 J. P. MARX 2,667,151

EXHAUST MANIFOLD FOR INTERNAL-COMBUSTION ENGINES

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Fig. 1

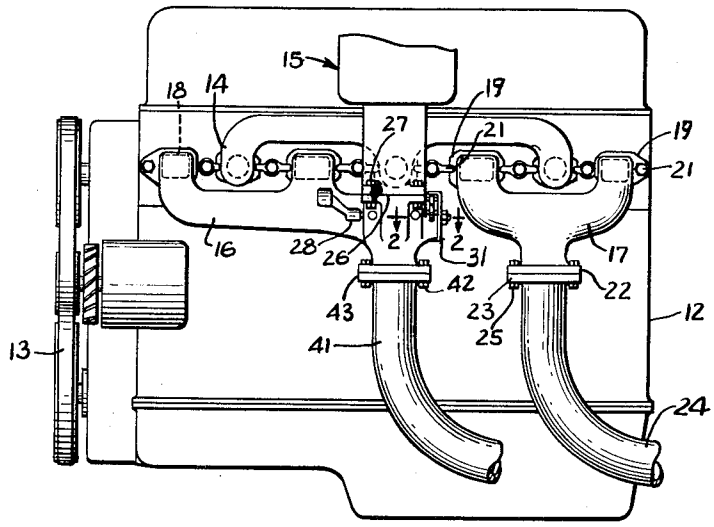


Fig. 2

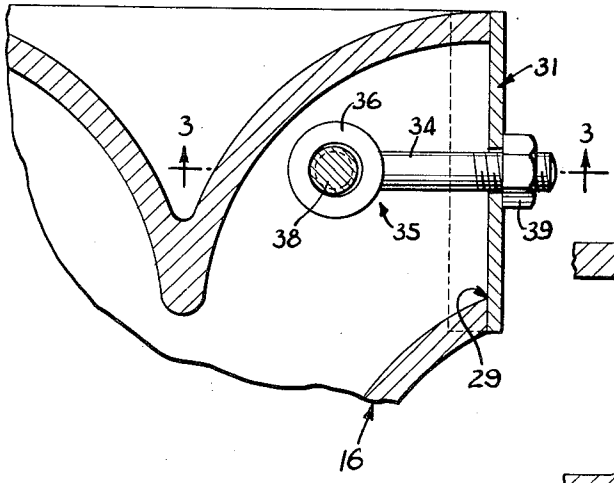
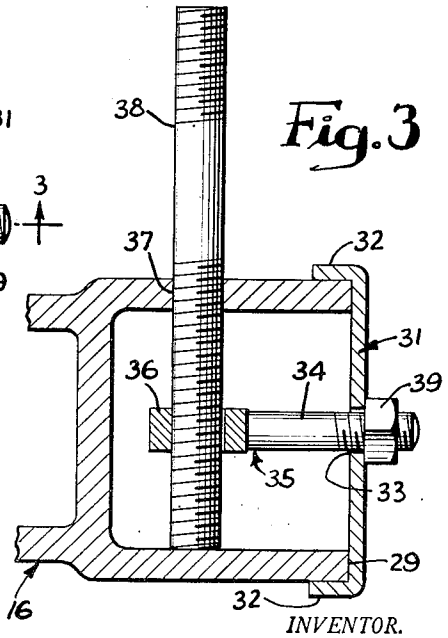


Fig. 3



INVENTOR.
JOSEPH P. MARX
BY
Elmer L. Quickel
Atty.

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EXHAUST MANIFOLD FOR INTERNAL-COMBUSTION ENGINES

Joseph P. Marx, Hartford, Wis.

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10 Claims. (Cl. 123—122)

1

The invention relates to improvements in exhaust manifolds for internal combustion engines and is more particularly concerned with the novel construction and assembly of a two-section manifold.

The standard one-piece exhaust manifold on an internal combustion engine is, in most instances, provided with a heat riser to the carburetor. The provision for two exhausts, which is highly advantageous for several well-known reasons, is now conventional in most V-8 internal combustion engines; however, there is at present a trend to remove the original one-piece exhaust manifold on 6-cylinder engines and to substitute in its place a pair of exhaust manifolds, each accommodating three cylinders and each having its own exhaust pipe, muffler and tail pipe. When two known types of manifolds replace the original one-piece manifold, there is no means available to conduct heat to the carburetor. This and other disadvantages and shortcomings of the present practices are all overcome by the present construction and it is, therefore, an object of the invention to provide novel means to accomplish the desired results.

Another object of the invention is to provide a novel exhaust manifold structure which contemplates the use of a portion of the original one-piece manifold and to thereby keep the cost of the conversion to a minimum.

Another object is to provide a two-piece exhaust manifold assembly for a 6-cylinder internal combustion engine, which includes a heat riser for the carburetor.

Another object is to provide a novel two-piece exhaust manifold which is very efficient in use, easy and inexpensive to install, and very practical.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel features of construction, arrangement and combination of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportion, size and minor details of the structure may be made without departing from the spirit, or sacrificing any of the advantages of the invention.

For the purpose of facilitating an understanding of my invention, I have illustrated in the accompanying drawings a preferred embodiment thereof, from an inspection of which when considered in connection with the following description, my invention, its mode of construction, assembly and operation and many of its advantages, should be readily understood and appreciated.

2

Referring to the drawings in which the same characters of reference are employed to indicate corresponding or similar parts throughout the several figures of the drawings:

Fig. 1 is a side elevational view of an internal combustion engine, showing the novel two-piece exhaust manifold installed thereon.

Fig. 2 is an enlarged detail sectional view of one of the manifolds, taken substantially along line 2—2 of Fig. 1.

Fig. 3 is a sectional detail view taken on line 3—3 of Fig. 2.

Referring particularly to Fig. 1 of the accompanying drawings, 12 schematically illustrates a 6-cylinder internal combustion engine, having the usual fan and generator belt 13 at the front end thereof and provided with the usual intake manifold 14, which is connected in the usual manner to a carburetor 15. The engine 12 is provided with two exhaust manifolds 16 and 17, each of which is in communication, through exhaust ports 18, with three of the cylinders of the engine. The exhaust manifold 17 may be of any conventional construction and, as shown, it is substantially Y-shaped and is provided with mounting flanges 19 to receive bolts 21 for securing it in place on the engine block. The base portion of the exhaust manifold 17 has an external flange 22 with which is matched a similar flange 23 on an exhaust pipe 24. Bolts 25 pass through aligned openings in the flanges 22 and 23 for securing the exhaust pipe 24 to the exhaust manifold 17.

The exhaust manifold 16 embodies the features of the present invention. It may constitute a part of the manifold with which the engine was originally equipped. Such a manifold is provided with a heat riser, shown at 26. This heat riser includes a surface upon which is secured, as by bolts 27, the base end of the carburetor 15. It also includes the usual flutter valve (not shown) which is carried on a shaft extending to the outside of the manifold and carries on its end a weighted arm 28. In the embodiment illustrated, the manifold 16 terminates in an open end 29. This results from cutting off of the rear portion of the original manifold. It is, therefore, necessary to seal said open end and there is, accordingly, provided a plate 31 formed from relatively thick steel sheet stock. As illustrated in Fig. 3, the plate 31 has end flanges 32

which overlie and snugly embrace opposed outside surfaces of the manifold 16.

The plate 31 is apertured centrally, as at 33, to receive therethrough the stem 34 of an eye-bolt 35. The eye 36 of said eye-bolt is so positioned within the exhaust manifold 16 as to align with a tapped opening 37 provided in one of the walls of said manifold. A fixture stud 38 is threaded into the tapped opening 37 and passes freely through the eye 36 with its free inner end preferably in firm abutment with the inside face of the opposite wall of said manifold.

It should be quite evident that the fixture stud 38 constitutes a mounting for the eye-bolt 35 and that when a nut 39 is screwed upon the projecting externally threaded end of the eye-bolt stem 34, the plate 31 is drawn tightly against the open end 29 of the manifold 16 to seal the same. The manifold 16 is, of course, also connected with an exhaust pipe 41, as by means of bolts 42, which pass through matching flanges 43 on the respective parts.

The instant structure is such that it is a relatively simple and inexpensive procedure to install dual exhausts in a 6-cylinder internal combustion engine without the creation of the usual back pressures accompanying such installations when made in accordance with prior practices and, further, that the efficiency of the engine is in no way impaired because the necessary heat riser to the carburetor is retained. All that is necessary in order to convert the present one exhaust manifold system to the instant two-exhaust manifold system is to remove the rear portion of the exhaust manifold with which the engine is equipped, mount the eye-bolt and plate assembly to close the cut end of the portion of the exhaust manifold retained, and to then install a separate Y-shaped manifold to accommodate the exhaust from the cylinders not accommodated by the retained portion of the original manifold.

It is believed that my invention, its mode of construction and assembly, and many of its advantages should be readily understood from the foregoing without further description, and it should also be manifest that while a preferred embodiment of the invention has been shown and described for illustrative purposes, the structural details are nevertheless capable of wide variation within the purview of my invention, as defined in the appended claims.

What I claim and desire to secure by Letters Patent of the United States is:

1. An exhaust manifold assembly for an internal combustion engine comprising, in combination, an exhaust manifold section mounted on the engine open at one end, a plate fitted over said open end, means to secure said plate in place tightly, and a second manifold section mounted on said engine.

2. An exhaust manifold comprising, in combination, a substantially tubular member having ports adapted to register with the exhaust ports of an internal combustion engine and an exhaust outlet, a heat riser integral with said member, said member having an open end, and a cover secured tightly over said open end.

3. An exhaust manifold comprising, in combination, a substantially tubular member having ports adapted to register with the exhaust ports of an internal combustion engine and an exhaust outlet, a heat riser integral with said member, said member having an open end, a cover for said open end, and an eye-bolt and nut securing said cover in place.

4. An exhaust manifold comprising, in combination, a substantially tubular member having ports adapted to register with the exhaust ports of an internal combustion engine and an exhaust outlet, a heat riser integral with said member, said member having an open end, a cover secured tightly over said open end, and flanges on said cover.

5. An exhaust manifold having a heat riser and an open end; a plate overlying and closing said open end, a fixed stud in said manifold, an eye-bolt on said stud, said plate having an aperture through which the eye-bolt extends, and means engaging said eye-bolt to draw the plate tightly over said open end to seal the same.

6. In an internal combustion engine having a plurality of exhaust ports on one side of the cylinder block and a fuel carburetor, an exhaust manifold section communicating with some of said exhaust ports, an exhaust manifold section communicating with other of said exhaust ports, a heat riser on one of said sections upon which the carburetor is mounted, said one section having an open end, and a plate closing said open end.

7. In an internal combustion engine having a plurality of exhaust ports on one side of the cylinder block and a fuel carburetor, an exhaust manifold section communicating with some of said exhaust ports, an exhaust manifold section communicating with other of said exhaust ports and a heat riser on one of said sections upon which the carburetor is mounted.

8. In an internal combustion engine having a plurality of exhaust ports on one side of the cylinder block and a fuel carburetor, an exhaust manifold section communicating with some of said exhaust ports, an exhaust manifold section communicating with other of said exhaust ports, a heat riser on one of said sections upon which the carburetor is mounted, said one section having an open end, a plate closing said end, and flanges on at least two edges of said plate to embrace the manifold section on which it is mounted.

9. In an internal combustion engine having a plurality of exhaust ports on one side of the cylinder block and a fuel carburetor, an exhaust manifold section communicating with some of said exhaust ports, an exhaust manifold section communicating with other of said exhaust ports, a heat riser on one of said sections upon which the carburetor is mounted, said one section having an open end, a plate closing said end, and a bolt and nut securing said plate in place.

10. In an internal combustion engine having a plurality of exhaust ports on one side of the cylinder block and a fuel carburetor, an exhaust manifold section communicating with some of said exhaust ports, an exhaust manifold section communicating with other of said exhaust ports, a heat riser on one of said sections upon which the carburetor is mounted, said one section having an open end, a plate closing said end, a bolt mounted in said one manifold section and extending through an opening in the closure plate, and nut threaded on the protruding end of said bolt to secure the plate in place tightly.

JOSEPH P. MARX.

No references cited.