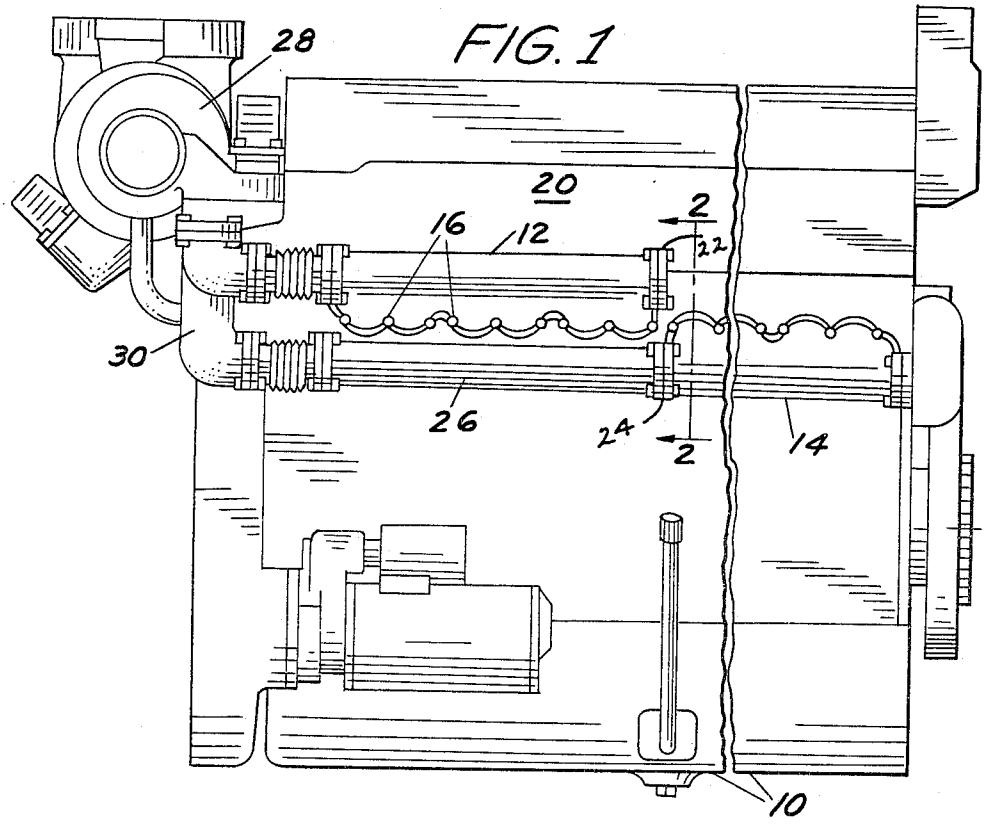
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EXHAUST MANIFOLD

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FIG. 1



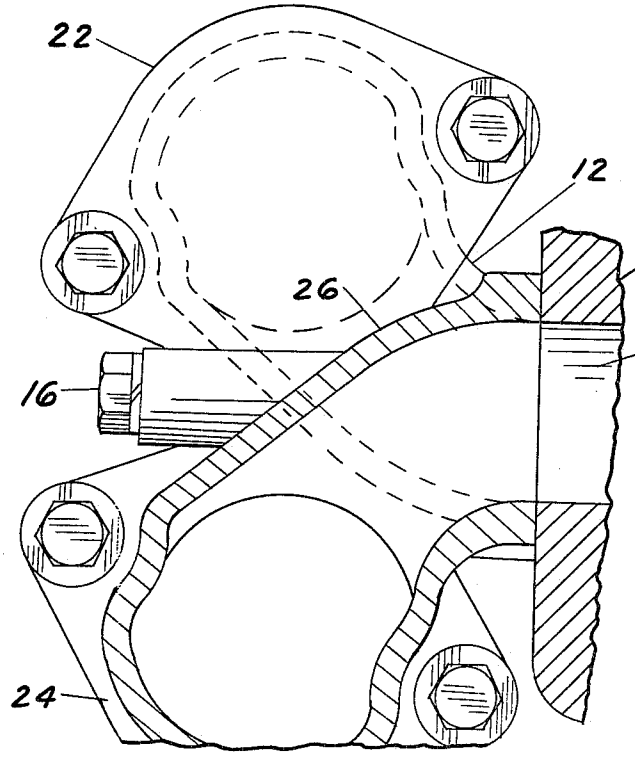


FIG. 2

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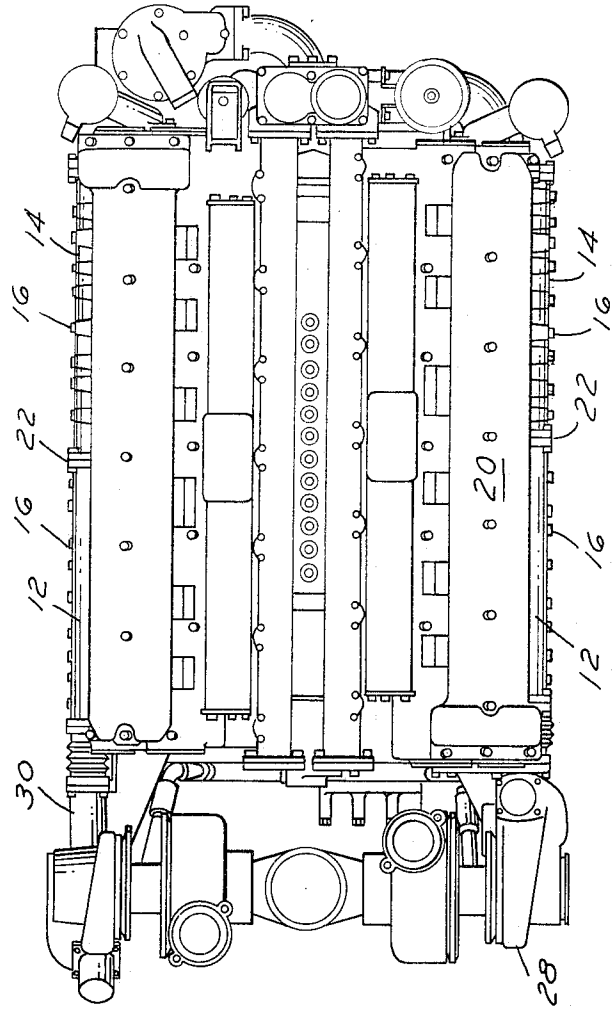


FIG. 3

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3,488,944

EXHAUST MANIFOLD

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Int. Cl. F02b 41/10, 75/10
U.S. Cl. 60—13 2 Claims

ABSTRACT OF THE DISCLOSURE

Apparatus comprising a single casting that can be used for any exhaust ports from the cylinder head of an internal combustion engine, whereby by inverting the casting and adding a pipe member a split manifold system is provided wherein the impulse effect of the exhaust gas from separate sets of cylinders is directed to a turbocharger via a split housing.

This invention relates to internal combustion engines and more particularly to those having a manifold arrangement for multiple cylinder engines having a split manifold system wherein impulse effect of the exhaust gas from separate sets of cylinders is directed to a turbocharger via a split support housing.

The improved manifold arrangement is particularly adapted to engines of a multiple cylinder type embodying two or more batteries of cylinders arranged in V-formation.

The principal object of the present invention is to provide a new and improved exhaust manifold comprising a casting member so designed that but one uniform casting may be secured to the cylinder head to take care of the exhaust gases from any one set of cylinders.

Another object of the invention is to provide a new and improved exhaust system wherein but one exhaust manifold is needed for each set of cylinders in combination with a straight pipe member.

A further object of the invention is to provide a new and improved exhaust system whereby one casting can be used for any three exhaust ports from the cylinder head and whereby by inverting said casting and adding a pipe member a split manifold system is provided wherein the impulse effect of the exhaust gas from separate sets of cylinders is directed to the turbocharger via a split housing.

A still further object of the invention is to provide a new and improved exhaust system wherein a turbocharger can be mounted on either end, or on alternate opposite corners of the engine using the same manifold hardware.

The above and other objects of the invention will appear more clearly from the following more detailed description and from the drawing, wherein:

FIG. 1 is a side elevation of an engine having incorporated therein the exhaust manifold, pipe and turbocharger disclosed herein.

FIG. 2 is a cross section showing both exhaust manifolds in their relative vertical locations, and

FIG. 3 is a top plan view of the engine shown in FIG. 1, showing the interchangeability feature of the turbochargers.

Referring now to the drawing the numeral **10** designates an internal combustion engine commonly used to drive a tank, or the like, the same, as shown, being of the twelve cylinder type, the cylinders, not shown, being arranged in banks of two, although the invention may be carried out in various types of internal combustion engines without any fundamental changes in the engine construction proper. The exhaust manifolds **12, 14**, are shaped castings, FIG. 2, the same being secured to the

cylinder head **20** by means of bolts **16**, manifold **12** being secured to the cylinder head adjacent three exhaust ports, not shown. Manifold **14** is identical to manifold **12** and is secured to the cylinder head adjacent the three exhaust ports **18**. Exhaust manifold **14** is coupled, as at **24**, to a run of pipe **26** or tubing leading to a turbocharger **28**, while numeral **30** designates a split support housing leading to the turbocharger. Caps **22** close the unused end of each manifold.

The manner in which the manifold operates is as follows:

The manifold castings **12, 14**, are identical and are secured to the sides of the cylinder head **20** by means of securing bolts **16** and in alignment with exhaust ports which are arranged in longitudinal alignment in groups of three, six on each side of the engine making twelve in all. Manifold **12**, FIG. 1, is connected directly to housing **30** and the exhaust gases pass directly into housing **30** and turbocharger **28**, while manifold **14** is identical with manifold **12**, but is inverted and secured to the cylinder head in alignment with exhaust ports **18**, so that the exhaust gases from the ports reach split housing **30** through coupled pipe **26**.

With the structure disclosed herein, with identical manifold castings, which in turn are interchangeable, the same casting can be used on different banks of cylinders, the result being a great saving in manufacturing costs. A split manifold system is quickly provided by inverting one casting on each cylinder head and adding a pipe to one casting while the casting located nearest the turbocharger discharges the exhaust gases from the first three exhaust ports directly into the split turbocharger support housing and the pipe transfers the gases from the casting farthest from the turbocharger. The turbochargers can be mounted on either end, or on alternate opposite corners of the engine with the same manifold hardware. This is accomplished by rearranging the same manifold components to suit turbocharger locations. Air flow characteristics will be the same for any turbocharger location.

There has been disclosed herein a new and unique manifold that can be used interchangeably and is designed to fit any three, in the case of a twelve cylinder engine, exhaust ports from a cylinder head. By inverting the casting and adding a pipe, a split manifolding system is provided wherein the impulse effect of the exhaust gas from separate sets of cylinders is directed to a split support housing of a turbocharger.

While we have shown an improved exhaust manifold applied to a multiple cylinder engine having a turbocharger we do not desire to be restricted to the exact arrangement shown and described, it being apparent that the number and arrangement of cylinders and manifolds may be varied without departing from the spirit or sacrificing the advantages of the invention.

We claim:

1. An exhaust interchangeable manifold for a multicylinder internal combustion engine having a block, cylinder head, cylinders, manifolds, exhaust ports, ducts and a turbocharger having end elbow members secured thereto, comprising

a first open ended elongated pipe-like manifold casting having a plurality of duct members secured thereto, said ducts seating laterally and secured on said block over one set of exhaust ports and in alignment therewith,

a second identical manifold casting inverted and adapted to fit over an additional set of exhaust ports,

cap members adapted to enclose one open end of each of said manifold castings,

end elbow members connecting said first manifold with said turbocharger to transport exhaust gases from

said manifold directly to said elbow member and said turbocharger,

a pipe member connecting said second manifold with said end elbow member leading to said turbocharger, said pipe member providing means for transporting exhaust gases from said second inverted manifold and said exhaust ports to said turbocharger.

2. An exhaust manifold as set forth in claim 1, wherein the cap members, end elbow members and connecting pipe members are identical so that they may be reversed when assembled allowing the turbocharger to be interchangeably mounted at either end of said engine.

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