Jan. 15, 1929. 1,699,279

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METHOD OF MAKING ENGINE MANIFOLDS

Filed June 27, 1927

Fig. 1.

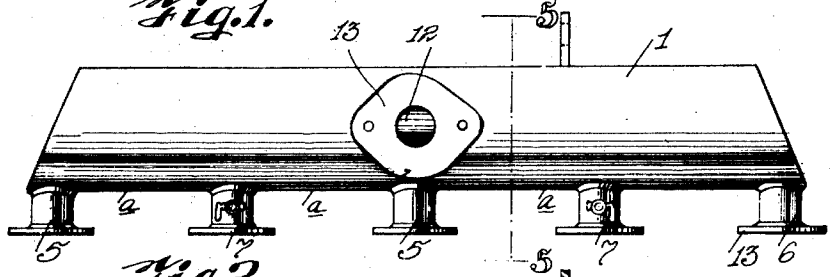


Fig. 2.

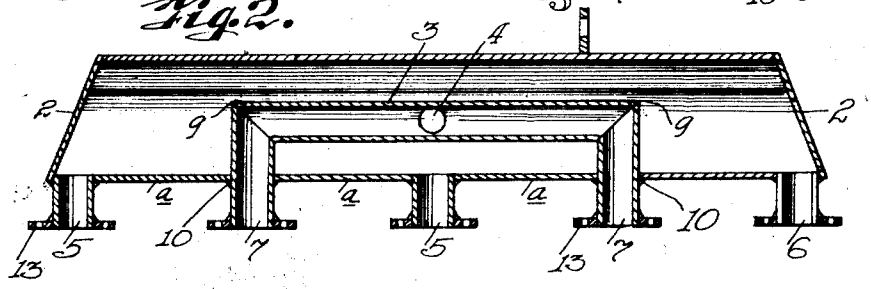


Fig. 3.

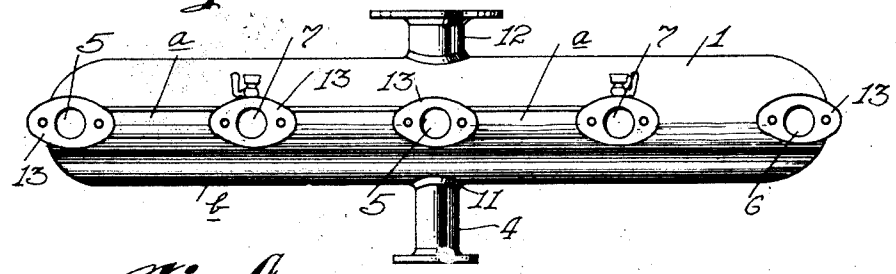


Fig. 4.

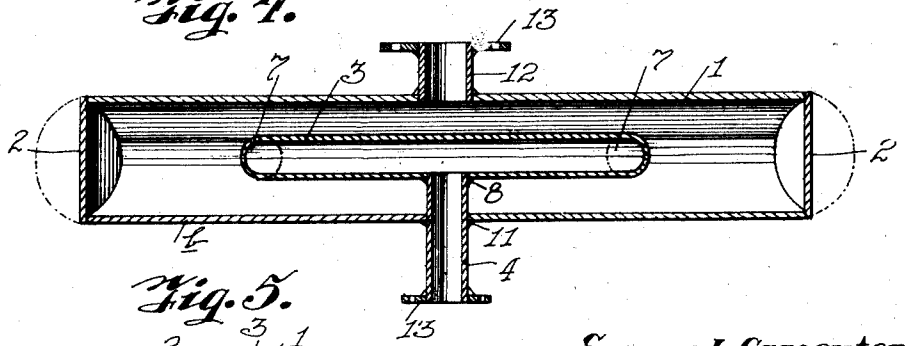
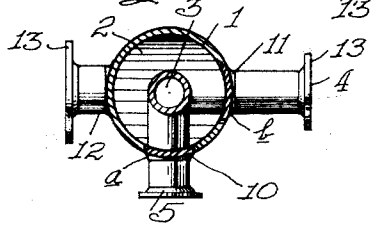


Fig. 5.



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METHOD OF MAKING ENGINE MANIFOLDS.

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This invention relates to internal combustion engines adapted for heavy duty, and it refers more particularly to an improved manifold for such engines of new manufacture, and the method of making the same, the principal object residing in the provision of a manifold constructed of seamless tubing and by reason of which, expansion and contraction, as a result of heating and cooling, has little or no effect upon the manifold, and consequently does not fracture or distort under the severe tests to which it is subjected as is common in the use of the conventional cast manifold.

Another object of the invention resides in the provision of a manifold, which by reason of its construction, a greater preheating area around the fuel intake pipes is provided, thus insuring a more positive fuel combustion, especially in cases where kerosene instead of gasoline is used as the major fuel.

Manifolds designed for engines adapted for tractor duty are usually constructed of cast iron and in a single piece, necessitating thick walls to withstand excessive heat, but when the tractor is put to severe tests, such for example as heavy farm duty, the engine becomes unusually hot, and upon cooling, the manifold contracts and frequently cracks under the strain. To obviate this objectionable feature, the present invention aims to provide a manifold composed of a metal having sufficient elasticity as to be capable of responding or adjusting itself to the requirements in the sudden excessive changes in temperature to which the exhaust manifold is subjected.

With the foregoing as prime objects, the invention has particular reference to certain novel features of construction by which said objects are attained, and which will become manifest as the description proceeds, taken in connection with the accompanying drawings wherein:—

Figure 1 represents a plan view of an engine manifold constructed according to the present invention.

Figure 2 is an axial cross-sectional view thereof.

Figure 3 is an elevational view of the manifold illustrating the alined intake and exhaust ports, showing the method of installing.

Figure 4 is an axial sectional view of Figure 3, illustrating the position of the intake pipes, and

Figure 5 is a cross-sectional view on lines 5—5 of Figure 1.

Continuing now more in detail with the drawings, reference is primarily made to the main exhaust chamber 1, which is composed of a seamless pipe having either end angularly cut, as shown in the Figures, to cover which, a head 2 is welded therein, as by the oxy-acetylene or other processes.

It is necessary, due to the seamless nature of the body 1, to slit the latter inward a short distance from one end as shown at *a* and *b*, in order to admit the intake pipe 3 and carburetor connection 4, which, after being assembled, is slid into place from one end of the pipe 1. The pieces of metal removed from the pipe 1 are preserved so that they may be welded back into place as shown in Figure 3 especially after the intake pipe 3 and exhaust ports 5—5 have been affixed thereto by welding, the third exhaust port 6 being welded to the pipe 1 after having cut an individual opening therein.

After having made the openings *a* and *b*, the intake arrangement, consisting of the pipe 3 ports 7—7 and carburetor connection 4 is assembled and welded together, the ports 7 extending through apertures cut into the metal strip removed from the pipe 1 to produce the slit at *a*, and the carburetor connection 4 extending through the strip removed at *b*. In this position a series of welds are made; one at 8, to affix the carburetor connection 4 to the pipe 3 spanning the intake ports 7, as in Figure 4; another at 9 in joining the ports 7 to the ends of the pipe 3, as in Figure 2; another at 10 about the intake ports 7 to secure the latter in the strips removed at *a*, and still another at 11 about the carburetor connection 4 in the strip removed from the pipe 1 at *b*. After this assembly is made, it is placed in the pipe 1 in the position shown in the several figures and the required number of welds made at the edges of the strips to hold them in their original position in the pipe 1; the same as if they had never been removed therefrom. The ports 5 and 6 having been installed as aforesaid, the head plates 2 are welded into place and the exhaust port 12 is welded into place opposing the carburetor connection 4.

After completion of the series of opera-

tions aforesaid, the apertured flanges 13 are welded to the ends of the several protruding pipes to provide for their proper connection to the motor, which latter has not been shown.

Manifestly, while a number of apertures are required to complete a manifold such as described, in excess to those required in forming the conventional cast manifold, it is very obvious that certain features of advantages are made possible thereby, such for example as thinner side walls, allowing for greater heating area, rendering the use of crude fuel more practical and efficient; a considerable reduction in weight, and due to the seamless nature of the body of the manifold and the character of material of which it is composed, sufficient elasticity is provided therein as to prevent any ill effects in contraction after expansion by excessive heat.

It should be understood that the foregoing description and illustrations apply to the principle involved in the invention and not to any specific design and that certain modifications may be made in such design from time to time as are considered practical and in keeping with the appended claims therefore what is claimed is:—

1. In a method of making an engine manifold capable of adjusting itself to sudden changes in temperature the steps comprising the selection of a seamless pipe of a definite length, beveling its ends; in forming and welding an intake assembly; in removing from said pipe a strip of metal longitudinally thereof to admit said intake assembly, then in reinstating and welding said strips to form an integral assembly, and finally in welding heads in the ends of said pipe.

2. In a method of making engine manifolds capable of adjusting themselves to sudden changes in temperature which consists in beveling the ends of a seamless pipe of definite length and in removing strips from said pipe of predetermined length longitudinally thereof; in forming and welding an intake assembly and sliding the latter into place from one end of said seamless pipe and in welding said strips back into place to produce an integral assembly, and finally in welding heads into the ends of said pipe.

3. In a method of making engine manifolds from seamless pipe, the steps comprising beveling the ends of said pipe and slotting the same longitudinally to a predetermined point toward its middle and in preserving the material so removed therefrom, in forming and welding together an intake assembly and sliding the same into said pipe in a manner as to permit the intake ports of said assembly to protrude through said slots; then in welding said material back into place to close said slots to permanently enclose said intake assembly, and in welding heads in the ends of said pipe.

In testimony whereof I affix my signature.

SQUARE L. CARPENTER.