Aug. 6, 1929. D. I. SELFRIDGE 1,723,954

MANIFOLD FOR INTERNAL COMBUSTION ENGINES

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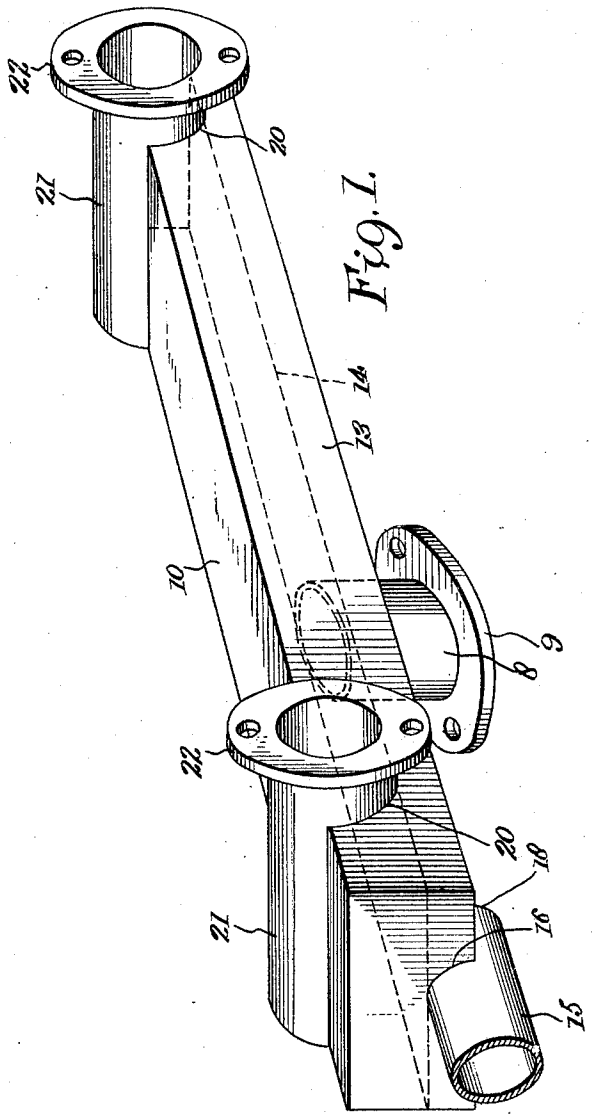

Fig. 1.

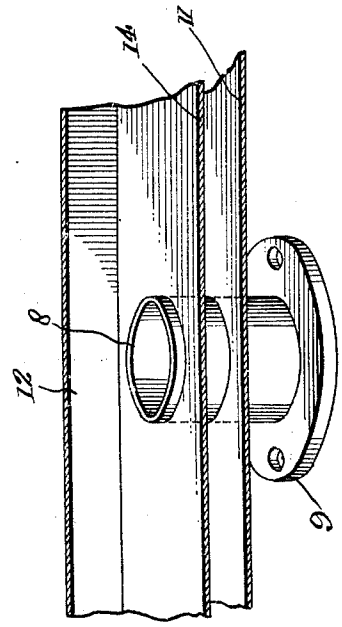

Fig. 2.

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Fig. 3.

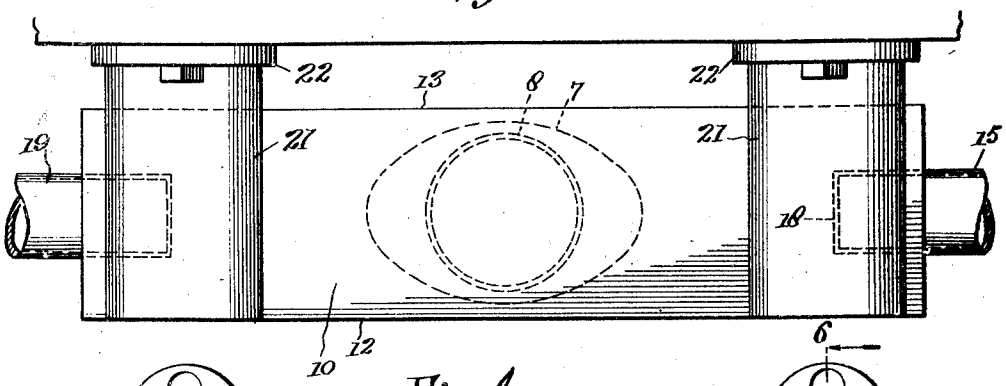


Fig. 4.

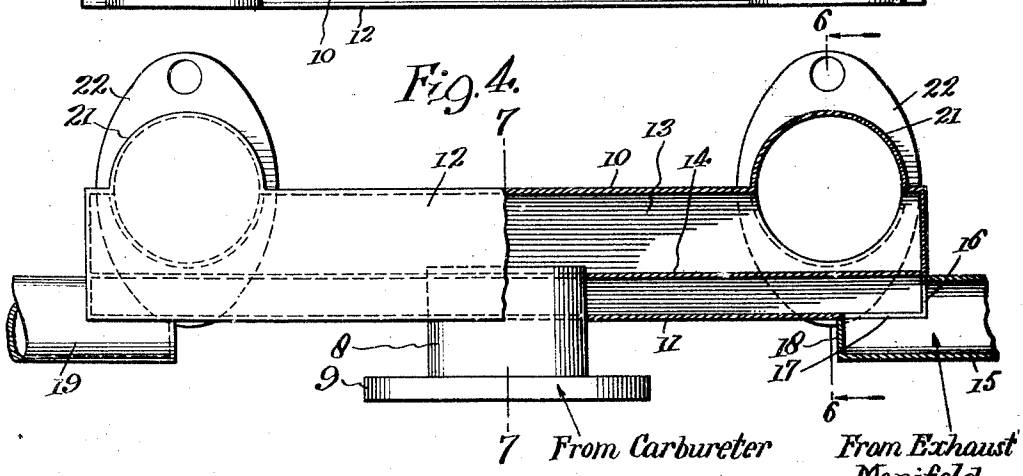


Fig. 5.

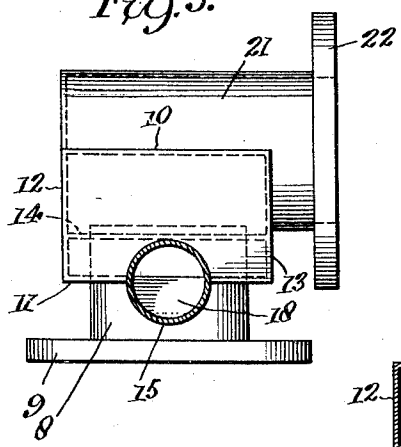


Fig. 6.

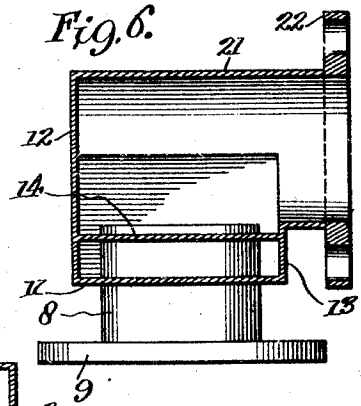
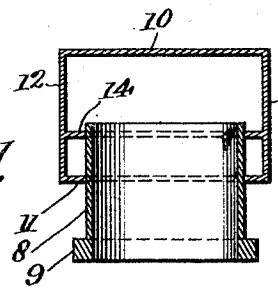


Fig. 7.



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UNITED STATES PATENT OFFICE.

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MANIFOLD FOR INTERNAL-COMBUSTION ENGINES.

Application filed November 5, 1926. Serial No. 146,482.

The present invention relates to improvements in manifolds for internal combustion engines, and has for an object to provide an improved manifold which will furnish so-called "dry gas" to the cylinders.

Unless very complicated means are employed, the gasoline flows from the carbureter nozzle in the form of a none-too-well broken up spray. The smaller globules of gasoline, particularly those of a more volatile nature are vaporized as they come in contact with the inrushing air. The larger particles, especially when the engine is more or less cold, fall to the bottom of the manifold and remain there, some of this liquid gasoline actually being drawn into the cylinders.

I propose to eliminate this condition in manifolds by the construction described below, and it is a further object of this invention to so construct and re-arrange the manifold as to secure very desirable results with an entirely simple and inexpensive construction.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claim appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a perspective view of an improved manifold constructed according to the present invention.

Figure 2 is also a perspective view with the manifold broken away and shown in section.

Figure 3 is a top plan view of the manifold.

Figure 4 is a side elevation partly in section of the same.

Figure 5 is an end view with a portion of the exhaust pipe broken away.

Figure 6 is a transverse section taken on the line 6—6 in Figure 4, and

Figure 7 is a similar view taken on the line 7—7 also in Figure 4.

Referring more particularly to the drawings the pipe from the carbureter is indicated at 8 having a flange 9 by which it may be bolted to the carbureter or to a pipe leading therefrom. This carbureter pipe 8 extends up substantially vertically through the manifold, and has its upper end opening into the manifold chamber, which in cross section (Figure 7) resembles a rectangular box consisting of the upper wall 10, the lower wall 11 and the side walls 12 and 13. In this manifold is contained the horizontal dividing plate 14 disposed nearer the bottom wall 11 than the top wall 10, and thus dividing the box-like structure into an upper manifold chamber and a lower comparatively shallow heater chamber.

The cross sectional area of the upper compartment or manifold chamber will preferably be equivalent to the area of the flange pipe 8 which carries the carbureter. The lower or heater compartment may have an arbitrary area or one which is sufficient to give space enough for an unobstructed flow of exhaust gas. The carbureter pipe 8 extends up through the bottom wall 11 and the partition or dividing plate 14 and its upper end is spaced above said plate 14, preferably about one-eighth of an inch there above.

The lower heater compartment is placed in connection with a source of heated fluid supply, for instance the exhaust pipe of the engine, whereby the heated exhaust products are conveyed longitudinally from one end of the heater chamber to the other. To this end a pipe 15 in connection with the exhaust pipe of the engine, as indicated is connected to one end of the heater chamber. On account of the shallowness of the heater chamber, the pipe will be of greater diameter than the chamber is deep and such pipe is provided with a cut away portion as to its end and one side; while the end wall of the chamber is removed, as indicated at 16, and also a portion of its bottom wall is removed, as indicated at 17, the pipe end 15 enveloping these removed parts. The lower portion of the pipe end is blanked, as indicated at 18.

A similarly cut away pipe section 19 is connected with the other end of the chamber, which is in like manner removed in order to place the pipe in communication with the interior of the heater chamber. The cross sectional area of these pipes 15 and 19 should be approximately equal to the cross sectional area of the heater compartment. A damper may be placed in the exhaust manifold, which is connected to the throttle in such a manner that it is nearly closed when the throttle is closed. A connection is taken off the exhaust manifold forward of the damper and is led to either

pipe 15 or 19. The other pipe may be carried as a small separate exhaust pipe under the vehicle.

The manifold chamber is cut transversely with a number of semi-cylindrical grooves 20, depending upon the number of intake openings in the cylinder block. Into these cut out portions are fitted the pipe sections 21 having perforated flanges 22 to bolt against the cylinder block. These pipe sections 21 are welded or otherwise secured to the manifold and have their out-board ends blanked. The cross sectional area of the pipes 21 may be the same as the area of the upper compartments or manifold chamber. It will be noted in Figure 4 that the lower portions of the pipes 21 are spaced above the partition 14.

In the use of the device, when the engine begins to turn over either by the action of the hand crank or self starter, the pistons on the downward stroke cause a partial vacuum in the intake manifold, this vacuum causing immediate functioning of the carbureter and drawing in air and atomized gasoline. This mixture flows through the carbureter pipe 8 and strikes the top 10 of the manifold. The mixture is deflected along this top 10 and passes out of the pipes 21 to the engine cylinders. Any large globules of gasoline will strike the top wall 10 and be projected down to the upper surface of the division plate 14.

This surface is enabled to carry a relatively large quantity of liquid gasoline due to the fact that the upper open end of the carbureter pipe 8 projects above the surface of the floor or partition 14 and consequently the liquid gasoline will not be permitted to flow back into the carbureter. The bottom of the intake pipe sections 21 is also above this level of the liquid fuel. As soon as the first explosion takes place, the hot exhaust gas therefrom passes through the heater chamber, causing the heating of the partition plate 14. This plate will get hot very rapidly on account of the damper in the exhaust pipe being nearly closed, and consequently any liquid gasoline lying on the plate will be immediately vaporized. As the engine increases in speed, due to the increase opening of the engine throttle, the damper in the exhaust pipe also opens, decreasing the amount of exhaust gas passing through the lower compartment, until at maximum speed, practically no exhaust gas will pass through the lower compartment of the manifold.

Thus the manifold produces the ideal condition of great heat applied to the incoming gases at slow motor speeds, while the suction is low and at high speeds furnishes substantially no heat to the incoming gases when the high suction is sufficiently great to break up and carry all of the atomized gasoline into the cylinder.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claim.

What is claimed is:—

A manifold for internal combustion engines comprising a body portion provided intermediate its top and bottom walls with a substantially flat partition co-extensive with the interior of the body portion and providing a lower heating chamber and an upper manifold chamber, said partition comprising substantially the entire bottom wall of the manifold chamber and comprising substantially the entire upper wall of the heater chamber, means for supplying said heater chamber with a heat medium, a carbureter pipe projecting upwardly through the heater chamber and through the partition plate and extending slightly beyond the upper surface of the plate to prevent drainage of fuel back into the carbureter pipe, and engine-intake pipes extending transversely of the manifold chamber and communicating therewith, said engine intake pipes having their lower portions spaced above said partition plate to prevent passage of liquid fuel into the said intake pipes.

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