Feb. 24, 1931. F. PURDY 1,793,509

MANIFOLD

Filed Nov. 9, 1929

Fig. 1

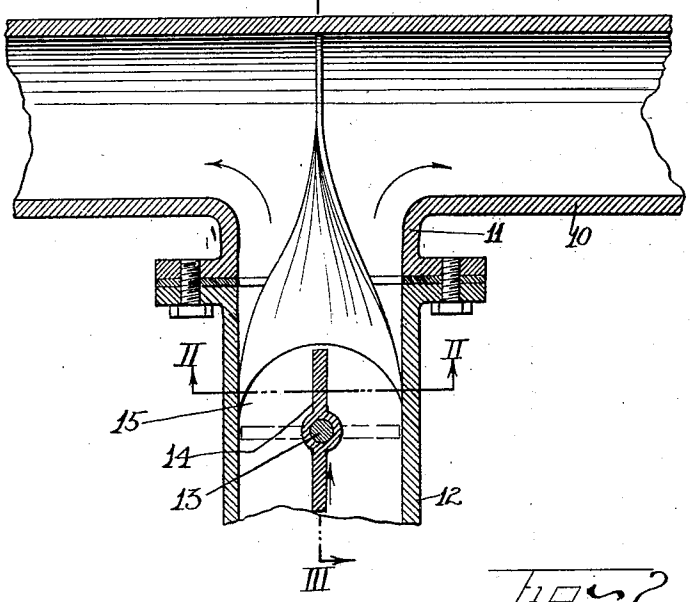


Fig. 2

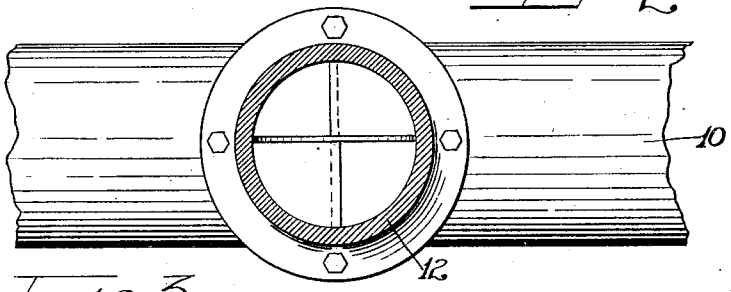


Fig. 3

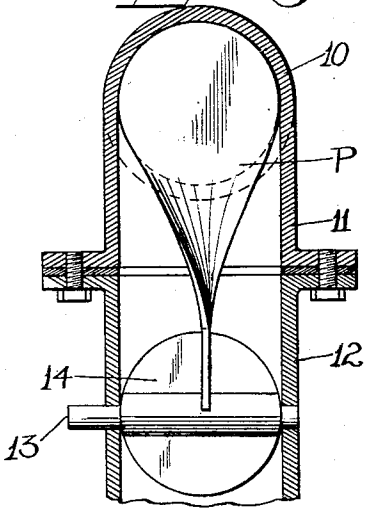
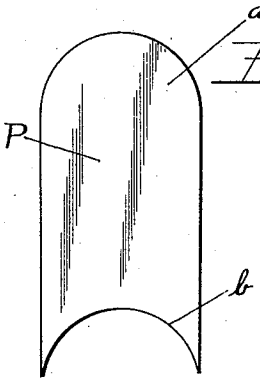


Fig. 4



Inventor

Frederick Purdy

by Charles O. Wills Attys

Patented Feb. 24, 1931 1,793,509

UNITED STATES PATENT OFFICE

FREDERICK PURDY, OF FLINT, MICHIGAN, ASSIGNOR TO MARVEL CARBURETER COMPANY, OF FLINT, MICHIGAN, A CORPORATION OF ILLINOIS

MANIFOLD

Application filed November 9, 1929. Serial No. 405,915.

This invention relates to manifolds for internal combustion engines and particularly to improved means for directing combustion mixtures into and through the intake manifold for distribution to the engine cylinders.

My invention is particularly applicable in an arrangement where the vertical mixture outlet end of a carbureter is connected with the inlet to the manifold midway between its ends. The main feature of my invention is the provision of a sheet metal directioning and separating plate extending transversely of the intake manifold at its inlet passage and projecting downwardly through said passage and into the mixture outlet of the associated carbureter, with the plate twisted 90° intermediate its ends and with its lower edge curved to be swept by the edge of the throttle valve within the carbureter outlet passage, so that after passing the throttle valve the combustion mixture will be uniformly divided to travel in opposite directions through the manifold and to the cylinders and will be given a swirling action by the twisted plate, the plate preventing surging in the manifold and assuring more uniform distribution of the combustion mixture to the cylinders.

As shown on the drawings:

Figure 1 is a vertical diametral section through the intake manifold of an engine and the upper outlet part of a carbureter associated therewith and showing my improved separating and distributing plate applied.

Figure 2 is a section on plane II—II, Figure 1.

Figure 3 is a section on plane III—III of Figure 1,

Figure 4 is a side elevation of the separator plate before twisting thereof.

As shown, the manifold pipe 10 has the inlet neck 11 to which a carbureter 12 is secured at its upper end in the well-known manner. The throttle valve shaft 13 supports the butterfly throttle valve 14 in the mixture outlet end 15 of the carbureter.

The directioning and separating plate P is formed from a piece of sheet metal originally flat, as shown in Figure 4, the upper end *a* of the plate being semi-circular to fit the bore of the manifold 10 and the lower edge *b* of the plate being arcuate to a radius slightly greater than the radius of the throttle valve disc 14. The plate is twisted intermediate its ends on its longitudinal axis, the twist being through 90°. The plate is applied in the manifold 10 with its upper semi-circular port extending transversely across the bore of the manifold, and with its lower end extending downwardly through the manifold neck and into and across the combustion mixture outlet 15 of the carbureter with its lower edge *b* in a plane at right angles with the throttle shaft and in position to be swept by the edge of the throttle disc when the valve is moved to opening position.

With the structure and arrangement shown, the combustion mixture drawn past the throttle valve by the suction of the engine encounters the lower edge of the separating and directioning plate P and the mixture flow is separated or divided to flow partly on one side and partly on the other side of the plate P, the curved or twist surfaces of the plate directioning the fuel to flow in opposite directions from the upper end of the plate and through the manifold for distribution to the cylinders. The arrangement is particularly effective for assuring proper distribution when the throttle is only partly open. The partly open valve deflects the mixture flow toward the high side of the valve and in sweeping across the underside of the valve the stream picks up fuel condensation particles from the under side of the valve. If the directioning plate were omitted such rich mixture would leave at one side of the carbureter outlet and flow in greater part through the corresponding side of the manifold, the other side of the manifold receiving only a lean mixture. However, with the separating and directioning plate all the mixture streams, whether rich or lean, are divided or bisected and the manifold will receive the same volume and richness of mixture at both sides of the plate.

I thus produce a very simple, inexpensive, yet highly efficient means for uniformly separating and directioning the flow of combustion mixture from the carbureter to the manifold and for assuring more uniform distribu-

tion of the combustion mixture to the cylinders, the plate acting also as a baffle to prevent surging of the mixture in the manifold. The distribution of the mixture is uniform throughout the range of operation of the throttle valve.

I claim as my invention:

1. In combination, the intake manifold of an explosive engine, a carbureter secured to said manifold with its outlet axis at a right angle with the manifold axis, a throttle valve in said outlet, and a separating plate for the combustion mixture flow interposed transversely in the manifold and extending into the carbureter outlet with its edge in position to be swept by the throttle valve when opened.

2. In combination, the intake manifold of an internal combustion engine, a carbureter secured to and communicating with said manifold with its outlet axis at right angles to the axis of said manifold, a throttle valve in said outlet, and a separating plate having upper and lower ends at right angles with each other, the upper end of said plate extending transversely across and dividing said manifold passage laterally, the lower end of said plate extending diametrally in the carbureter outlet and with its edge curved to be swept by the throttle valve when said valve is opened.

3. In combination, the intake manifold of an internal combustion engine, a carbureter communicating with said manifold intermediate its ends and with its axis at a right angle with the axis of the manifold, a throttle valve in said outlet, and a separating plate having upper and lower ends in planes at right angles with each other, the upper end of said plate extending diametrally in said carbureter outlet above the throttle valve and at right angles with the throttle valve axis, the lower edge of said plate being curved to be swept by the edge of the throttle valve when the valve is opened.

4. In combination, the intake manifold of an internal combustion engine having an inlet intermediate its ends, a carbureter secured to communicate with said inlet end with its outer axis at right angles to the axis of the manifold bore, a butterfly throttle valve in the carbureter outlet, and a separating and directioning plate for the combustion mixture delivered by the carbureter, said plate being twisted 90° intermediate its ends whereby its upper and lower parts are in planes of 90° with each other, the upper part of said plate extending diametrally across the bore of the manifold to divide said bore laterally, the lower end of said plate extending through the manifold inlet and diametrally into the carbureter outlet and at right angles to the throttle valve axis of rotation, the lower edge of said plate being curved to an arc of a radius substantially equal to the radius of said throttle valve whereby said edge will be swept by the edge of the throttle valve when said valve is opened.

5. In combination, the intake manifold of an internal combustion engine, a carbureter communicating with said manifold intermediate its ends, a throttle valve in said carbureter outlet, and a combustion mixture separating plate twisted 90° to provide upper and lower sections inclined at right angles to each other, the lower section extending diametrally across the carbureter outlet above the throttle valve, and the upper section extending diametrally across the bore of said manifold.

In testimony whereof I have hereunto subscribed my name at Chicago, Cook County, Illinois.

FREDERICK PURDY.