

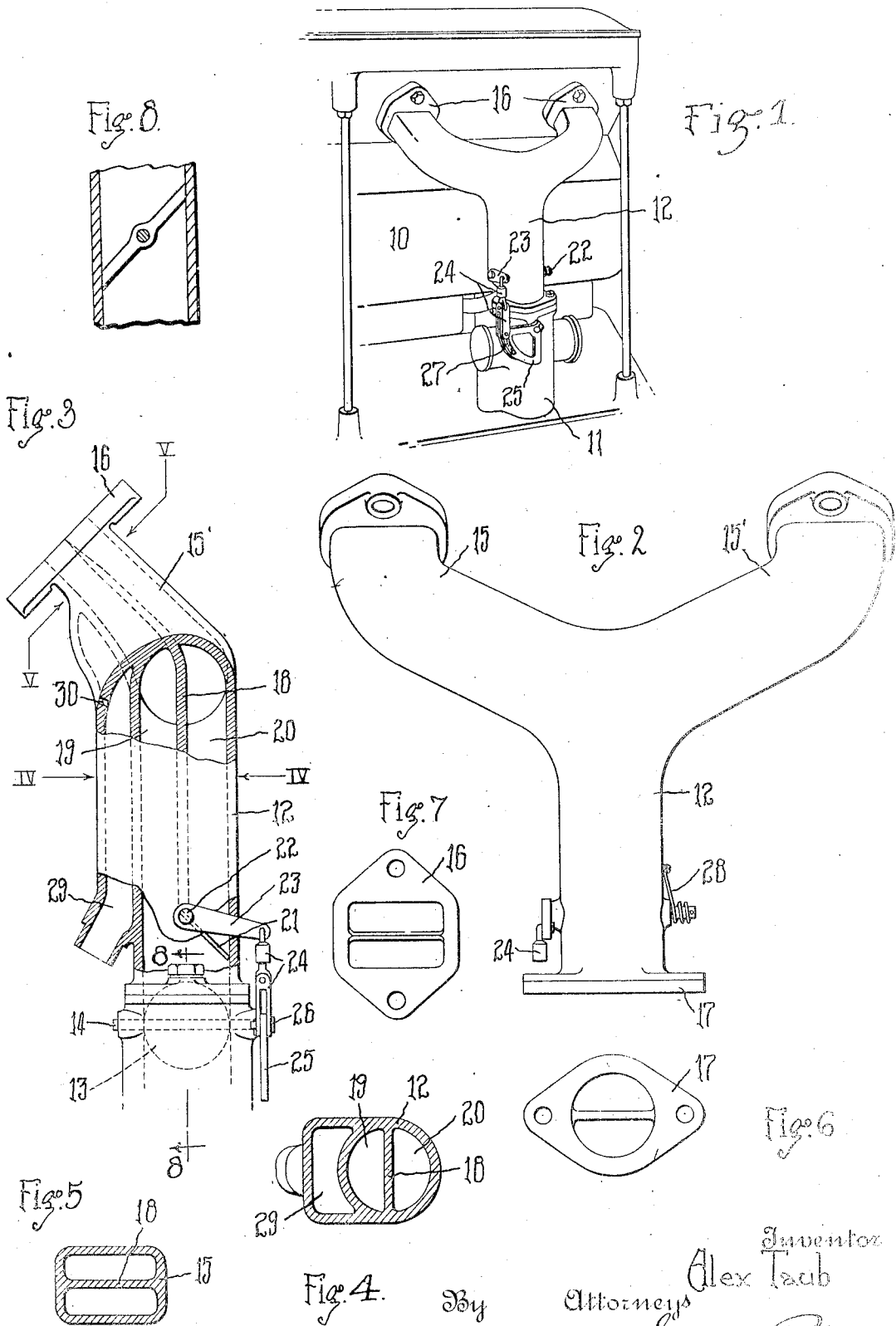
March 12, 1929.

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1,705,036

INTAKE MANIFOLD

Filed Jan. 2, 1920



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Patented Mar. 12, 1929.

1,705,036

UNITED STATES PATENT OFFICE.

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INTAKE MANIFOLD.

Application filed January 2, 1920. Serial No. 348,808.

The invention relates to intake manifolds for internal combustion engines and particularly to manifolds wherein provision shall be made for securing a more uniform velocity in the gas current being supplied to the engine than is possible with the forms of manifolds at present in general use.

With the wide variation possible in the speed of internal combustion engines it is obvious that a great difference exists between the amount of combustible mixture supplied per unit of time at the lowest speed and that supplied at the highest speed, and a correspondingly great range in the velocities of the gas current necessarily results. In order, however, to secure uniformity in the mixture and in the distribution to the cylinders it is advisable not to let the velocity of the current fall below a certain minimum and the carrying capacity of the manifold should be correspondingly limited. On the other hand the supply of a large quantity of gas necessary for high speeds through a manifold of restricted capacity unduly increases the friction and thereby disadvantageously affects the operation.

It is the primary object of my invention to provide means for overcoming the defects in the operation of intake manifolds as above indicated, and with that object in view the invention comprises a manifold having means for varying the carrying capacity of the gas passages in accordance with variations in speed. The invention further comprises various details in construction of an intake manifold all as hereinafter more fully set forth.

In the accompanying drawing illustrating one embodiment of my invention:

Fig. 1 is a perspective view of a portion of an internal combustion engine.

Fig. 2 is an elevation of an intake manifold.

Fig. 3 is an elevation, partly in section, of the manifold taken at right angles to the view in Fig. 2.

Figs. 4 and 5 are sections on lines IV—IV and V—V, respectively, of Fig. 3.

Fig. 6 is a plan view of the carbureter end of the manifold.

Fig. 7 is a plan of the engine end of one of the branches, and Fig. 8 is a section on line 8—8 of Fig. 3.

In the drawing, 10 designates a portion of an internal combustion engine having con-

nected therewith the carbureter 11 and the intake manifold 12. The carbureter may be of any desired construction and is provided with the usual throttle valve 13 mounted upon a shaft 14.

The intake 12 may, if necessitated by the type of engine, be provided with the branches 15, 15', which may be secured to the engine as by flanges 16. The branches are shown as of approximately rectangular cross-section adjacent the engine, but this form will, of course, vary with the character of the engine or the shape of the intake openings. The lower end of the manifold may be attached to the carbureter by flanged union 17 in the usual manner.

In the interior of the manifold is provided a division plate or partition 18, which I have shown as preferably formed integrally with the walls of the manifold. This partition begins at a point a short distance above the carbureter end of the manifold and extends preferably throughout both branches to the engine, thus forming two passages 19, 20, extending substantially from the carbureter to the engine. A flap valve 21 fixed to a shaft 22 is mounted at the lower end of partition 18, and is adapted to close passage 20.

In order to manipulate valve 21 I have provided shaft 22 with a lever 23 suitably connected as by links 24 to segment 25 fixed upon the shaft 14 of the throttle valve. The connection includes a pin 26 adapted to travel in a slot 27 in the segment. By this lost-motion connection I obtain the result that the throttle valve may be opened to a certain extent without affecting the position of valve 21, which is normally held to its seat as by spring 28. When, however, the throttle is further opened to obtain the higher engine speeds, the movement of the throttle results in the opening of valve 21 thereby permitting gas to pass through passage 20. It will be obvious that other equivalent forms of lost-motion devices, as a flexible connecting device such as a chain or the like, may be substituted for the lost-motion connection above described.

Suitably mounted adjacent to passage 19 I have provided a heating means consisting preferably of a passage 29 through which exhaust gases or other heating medium may be directed and which may have its walls formed, as shown, integrally with the walls of the manifold or otherwise as will be ob-

vious. It will be seen by reference to Fig. 3 that this heating passage or chamber extends substantially throughout the length of the manifold including the branches thereof.

5 This passage may have associated therewith any suitable means for permitting and limiting the flow of exhaust gases therethrough. Such means as shown in the vent 30 which may be of such size as to permit an amount
10 of exhaust to pass out through passage 29 necessary to maintain the desired temperature of the wall of passage 19. It will be seen that I have provided heating means for passage 19 only, as I deem it unnecessary to
15 apply heat directly to passage 20 which is in use only at comparatively high speeds, although the passage 20 will, of course, be heated to a certain extent by conduction. It is at low speeds when the heating means is
20 especially advantageous, and the construction described permits of heating all of the mixture which is used at low engine speeds. Additional heating means, however, may be provided for passage 20 if desired.

25 In the operation of the device, as will be clear from the foregoing description, the passage 19, remains at all times open to the combustible material, thereby providing a passageway of comparatively restricted cross-
30 section for use at low speeds. When, however, the throttle is adjusted to positions for production of the higher speeds within the capability of the engine passage 20 is gradually opened thereby continuously increasing
35 the cross-sectional area of the combined gas passages and maintaining substantial uniformity in the velocity of the gas.

It will be understood that various changes may be made in the details of construction
40 without departing from the spirit and scope of the invention and therefore I do not wish to be limited to the specific structure herein described.

I claim:

45 1. The combination with an internal combustion engine and a fuel intake therefor comprising a plurality of passages, of a pivoted throttle valve for controlling the flow of fuel to said passages, an additional piv-
50 oted valve for one of said passages, and con-

nections for operating said throttle valve and said additional valve arranged to permit opening of said throttle valve to a predetermined extent and thereafter effecting opening of said additional valve, the pivots on
55 said valves being on non-parallel axis.

2. The combination with an internal combustion engine and a carbureter, an intake leading from said carbureter to the engine, said intake comprising two passages separated by a common wall, a valve in said intake pivoted on an axis in the plane of said wall and adapted to close one of said passages without obstructing flow through the other, a throttle valve, arranged to control flow
60 through both said passages, and means for simultaneously operating said valves, said means being adapted to move said first mentioned valve toward open position as said throttle valve is opened.

3. An intake manifold structure for internal combustion engines having two delivery conduits, one of which is arranged to be heated, while the other remains relatively
75 cold, a valve which when closed causes the vapor to pass through the heated conduit, a carburetor arranged to deliver to the conduits of said manifold structure, a main throttle valve for controlling the delivery of vapor from said carburetor to said manifold
80 structure, and a connection between said two valves whereby said first noted valve will be moved to open position when said throttle valve is moved to substantially an extreme open position.

4. An intake conduit for internal combustion engines having a plurality of passages one of which is always open, a valve arranged to control flow through another of said passages without obstructing flow through said
90 open passage, a throttle valve for controlling flow through both of said passages, and means for actuating said first valve to open the passage controlled thereby as the throttle valve is opened.

5. Structure as set forth in claim 4 including means for heating said open passage. In testimony whereof I affix my signature.

ALEX TAUB.