

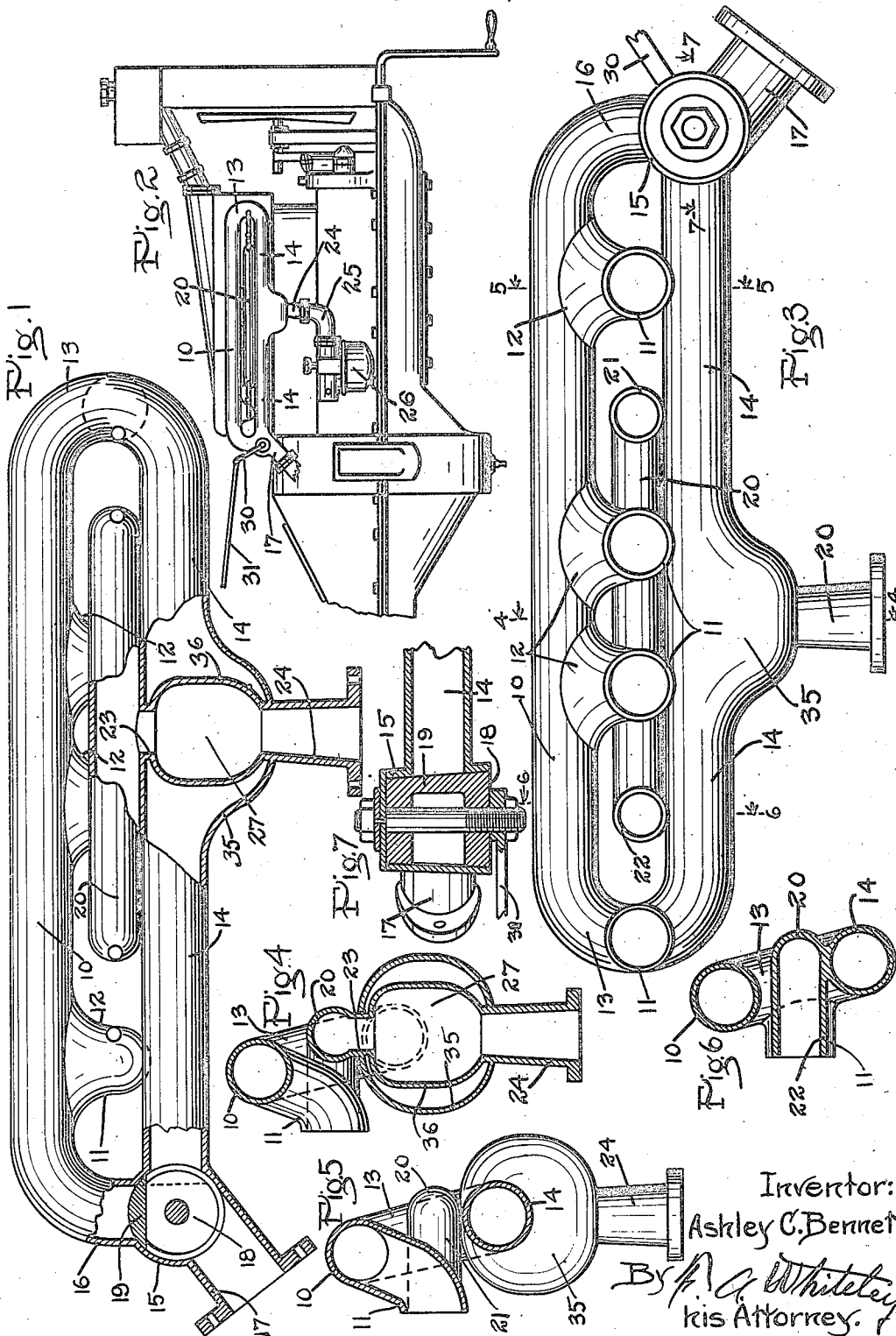
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A. C. BENNETT

INTAKE MANIFOLD

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UNITED STATES PATENT OFFICE.

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INTAKE MANIFOLD.

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To all whom it may concern:

Be it known that I, ASHLEY C. BENNETT, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Intake Manifolds, of which the following is a specification.

My invention relates to intake manifolds for carbureters, and has for its object to provide means whereby gas entering said manifolds may be preliminarily heated or not, as desired.

In carrying out the principles of my invention, I arrange a double channel for the exhaust manifold through one of which branches extends a portion of the passageway leading from the carburetor to the intake manifold, and I control said passageways by valve mechanism so that the exhaust gases may be compelled either to flow directly to atmosphere in the usual way or through the passageway containing the member extending from the carburetor, although my invention is capable of application in various forms, and includes broadly means for heating or not, at will, gas after it has left the carburetor and before it enters the cylinders. A preferred form of heating mechanism is shown here which involves a feature of my invention. This is an expanded chamber between the outlet from the carburetor and the inlet into the intake manifold, said expanded chamber being in the secondary exhaust passageway where its walls may be heated or not, in accordance with the practice of my invention.

The full objects and advantages of my invention will appear in connection with the detailed description thereof, and are particularly pointed out in the claims.

In the drawings illustrating the application of my invention in one form,—

Fig. 1 is an enlarged, part sectional, side elevation view of my improved device. Fig. 2 shows how the same may appear in connection with a gas engine. Fig. 3 is a side elevation view of my device from the other side of Fig. 1. Fig. 4 is a section on line 4—4 of Fig. 3. Fig. 5 is a section on line 5—5 of Fig. 3. Fig. 6 is a section on line 6—6 of Fig. 3. Fig. 7 is a sectional view on line 7—7 of Fig. 3.

As illustrated and described, my invention consists of an exhaust manifold comprising

a leg 10 connected by branch pipes 11 with the cylinders of the engine, said branch pipes being extended in bell-fashion, as indicated at 12, at their junction with the pipe 10, so that gas will flow with equal facility from said branches in either direction. The pipe 10 is connected by a bend 13, with a second leg 14, the leg 14 uniting in a valve chamber 15 with a second bend 16 from pipe 10. From the valve casing 15 extends exhaust pipe 17 which passes in the usual way to muffler and exhaust discharge. The chamber 15 is formed with a circular sealing surface which may be somewhat conical, as indicated in Fig. 7, for the purpose of taking up wear. The three members 14, 16 and 17 open respectively into this chamber, members 14 and 16 extending at right angles to one another, and member 17 on substantially the median line outwardly with respect to members 14 and 16. Within this chamber is positioned a threeway cock 18 having a portion 19 which in one position of the cock blocks passageway 10 and in another position blocks passageway 14. In the first of these positions, the passageway 14 is left entirely open to exhaust pipe 17, so that the exhaust gases are free to travel through pipe 10, bend 13, and passageways 14 and 17. When the cock 18 is turned into the position indicated in dotted lines in Fig. 1, blocking passageway 14, the passageway 10 is opened through bend 16 directly to exhaust pipe 17.

Preferably, the pipes 10 and 14 in order to provide a more compact construction will be disposed in an oblique plane, as indicated in Figs. 5 and 6 and between these pipes and, if desired integral with pipe 14, will be a first member 20 of the intake manifold having opening therefrom passages 21 and 22 toward the engine and a single passageway 23, which ultimately reaches an inlet pipe 24 connected through a pipe 25 with the carburetor 26, as best shown in Fig. 2. Connecting passageways 23 and 24, is a member which is included within an expanded portion 35 of the pipe 14. This member may be of any desired form, shape, or size and, obviously, the walls thereof will be exposed to the hot exhaust gases whenever the cock 18 is turned into the position shown in Fig. 1, so that exhaust must take place through pipe 14.

I have found that most highly efficient results are obtained by making the heating

member 36, as shown herein, globular in form comprising an enlarged chamber 27. This has the effect of slowing the velocity of the stream of incoming gas as it passes through the chamber, with the result that the larger particles of unevaporated liquid will, under the influence of gravity, tend to fall back, resulting in their being thrown to the side and against the walls of heated member 36.

The advantages of my invention will be obvious. Its greatest use is in connection with the burning of liquid fuels of a relatively heavy character, such as kerosene, crude oil, and various forms of distillate. Such fuels are hard to break up into gaseous form, and tend to pass from the carbureter in small particles or drops. If these unevaporated particles reach the manifold and the engine cylinders, flooding and serious engine trouble may result. It is obvious that the heating member 36, being in the main stream of the entire exhaust, will be heated very hot so that any particles of liquid striking the same, will be instantly vaporized, such evaporation resulting in keeping the temperature of the heating member down sufficiently to prevent preignition. It is not, however, desirable at all times or speeds with any given fuel, or at all with some fuels, to employ the heating member 36. Under such circumstances with the double exhaust device and the cock 18, hand controlled through arm 30 and con-

necting member 31, it is always possible to cut out the heating of member 36 whenever desired, and also to any degree desired, for it is clear that the portion 19 of cock 18 may be made to cover completely the opening either from pipe 14 or bend 16, or may be made to cover more or less each of said openings, resulting in a greater or less flow of hot gases through pipe 14 and heating member 36. At high speeds when the weight of the mixture going to the cylinders in proportion to its volume should be as great as possible, it is usually desirable to cut out the heater entirely, unless the fuel used is so heavy that the heater can be advantageously used in breaking up the heavy particles passing through pipe 24 and precipitated against the interior walls of chamber 27.

I claim:

An intake device for gas engines comprising an exhaust pipe formed in two interconnected sections, one of said sections being connected with the cylinders of the engine, an intake manifold secured upon the other section and having a connection with the carbureter extending through and surrounded by said other section, and controllable means for causing varying quantities of the exhaust gases to pass through said last mentioned pipe section.

In testimony whereof I affix my signature.

ASHLEY C. BENNETT.