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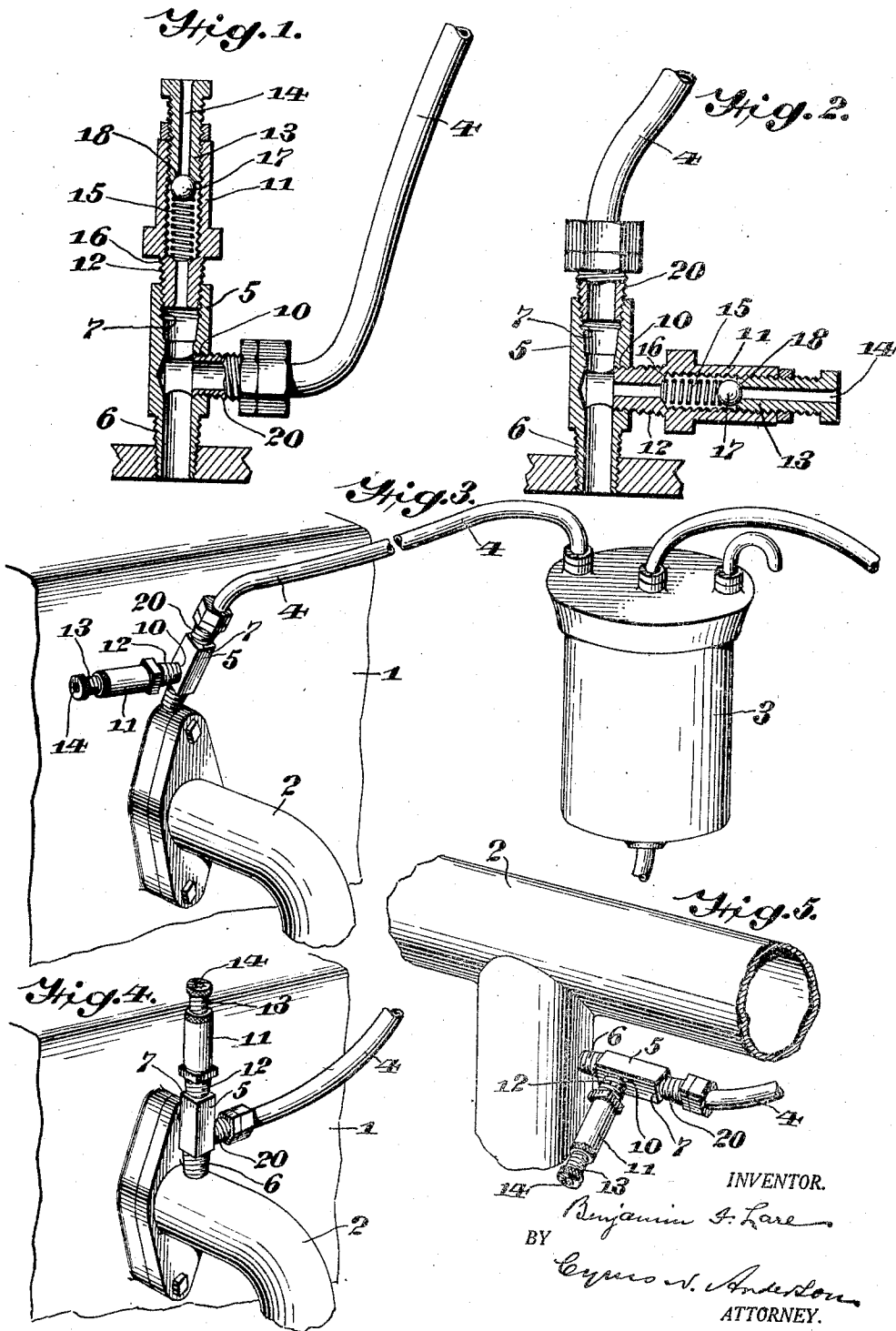
B. F. LARE

1,564,076

COMBINED VACUUM TUBE ATTACHMENT AND AIR INLET DEVICE FOR GAS ENGINES

Filed March 7, 1925

2 Sheets-Sheet 1



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Fig. 6.

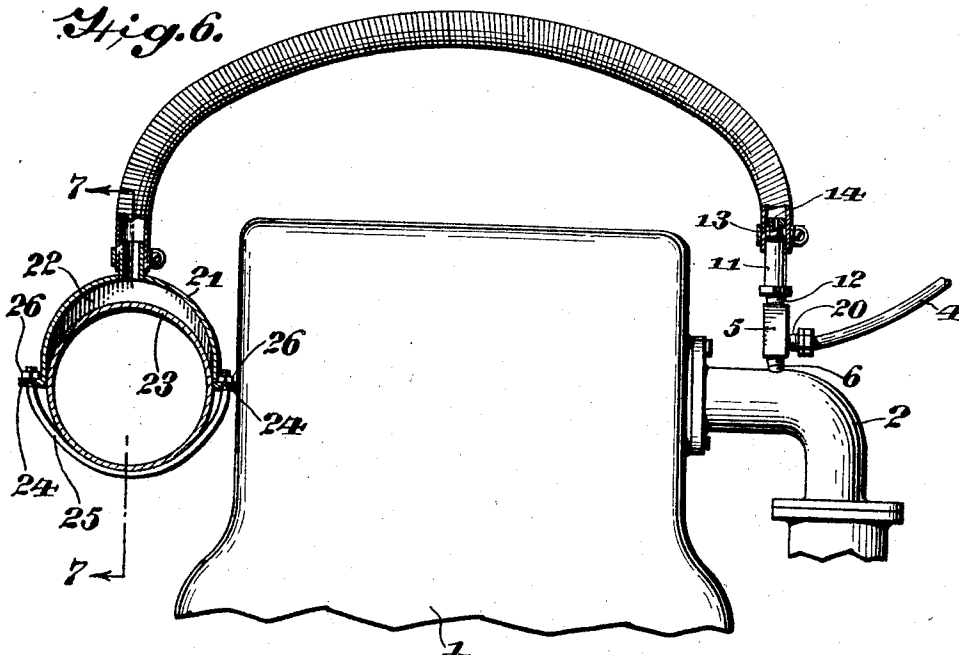
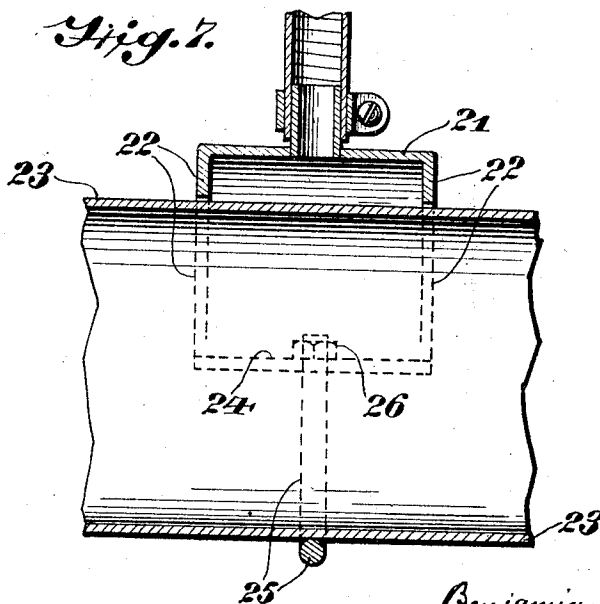


Fig. 7.



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COMBINED VACUUM-TUBE ATTACHMENT AND AIR-INLET DEVICE FOR GAS ENGINES.

Application filed March 7, 1925. Serial No. 13,781.

To all whom it may concern:

Be it known that I, BENJAMIN F. LARE, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented an Improvement in Combined Vacuum-Tube Attachments and Air-Inlet Devices for Gas Engines, of which the following is a specification.

My invention relates to devices, sometimes called "vaporizers," which are adapted to be connected to a vacuum tube leading from a vacuum tank to the inlet manifold of a gas engine and which devices are also adapted to have connection directly with such manifold for the purpose of introducing or permitting the introduction of air either into the said vacuum tube or directly into the said manifold. The present invention relates to a device of the character indicated, but which is of a construction such that it provides means not only for the introduction of air either directly into the manifold or into the vacuum tube, but also provides means whereby the connection of the latter to the inlet manifold may be facilitated under the varying conditions under which connection must be made to the manifolds of structures having different or differing mechanical characteristics.

In some cases the relation of the manifold to other parts of the gas engine structure is such that connection of the vacuum tube and air inlet device thereto is more or less difficult and the general object of the present invention is to provide an attachment of a character such that it may be adapted to the different conditions met with in practice for the purpose of facilitating its connection with a manifold at a point desired, or perhaps, at the only point which may be available for connection.

It is also an object of the invention to provide an attachment of the character indicated comprising what may be regarded as an intermediate member through the medium of which the air inlet device and an end of the vacuum tube may be connected with the inlet manifold of a gas engine.

Another object of the invention is to provide an attachment comprising a member, one end of which is adapted to be fastened in an opening leading to the interior of an inlet manifold and to the opposite end of which either an air inlet device or an end

of the vacuum tube may be connected, and the side of which is provided with an opening within which either the air inlet device or an end of the vacuum tube may be connected, whereby adaptation of the said attachment to different conditions met with in practice is facilitated and made possible.

A further object of the invention is to provide means whereby air may be preheated before it is introduced into the inlet manifold through the said air inlet device.

To these and other ends the invention comprehends the construction and arrangement of parts hereinafter described in detail and particularly pointed out in the claims and as illustrated in the accompanying drawings, in which I have illustrated a convenient form of mechanical embodiment of the said invention.

In order that an understanding of the invention may be had more readily reference should be made to the accompanying drawings in which:

Fig. 1 is a view in longitudinal section of an attachment embodying the invention;

Fig. 2 is a similar view in which the parts or the attachment have been rearranged and differently connected together;

Fig. 3 is a view in perspective showing a vacuum tank and a portion of a gas engine casing to which is attached a portion of an inlet manifold, and also showing the vacuum tube connection between the said vacuum tank and the gas inlet passageway leading to the said engine, and showing also the attachment embodying my invention and the manner in which it is connected with the said manifold and with the said vacuum tube;

Fig. 4 is a view in perspective showing a portion of a gas engine casing and the inlet manifold and one manner of connecting the said attachment thereto, the said attachment being in reversed position with respect to the position shown in Fig. 3;

Fig. 5 is a view in perspective of a gas inlet manifold showing the manner in which my attachment is employed in connection therewith;

Fig. 6 is a view showing in elevation a portion of a gas engine casing or cylinder and an inlet manifold having connection therewith and also showing the said attachment and means in section for preheating

the air before introducing the same through the said attachment into the said manifold; and

Fig. 7 is a sectional view taken on the line 5 7—7 of Fig. 6.

Referring to the drawings:

1 designates broadly a portion of the cylinder or casing of a gas engine for automobiles and 2 designates as a whole a gas inlet manifold for supplying gas to the combustion chambers in said engine. The vacuum tank previously referred to is of any known construction, as is shown at 3 in Fig. 3. The vacuum tube 4 is connected at its outer end to the top portion of the said vacuum tank and its inner end is connected through the medium of the attachment constituting or embodying my invention either directly with some part of the manifold 2, as shown in Figs. 4, 5 and 6, or with some other part of the gas engine structure, as shown in Fig. 3. The structure of the attachment is identical in the several figures shown, the only difference being in the way in which parts thereof are assembled and in which the connections are made between the manifold or a portion of the gas engine cylinder and the vacuum tube 4.

The attachment comprises a short tubular plug 5, one end of which is exteriorly threaded, as indicated at 6, while the other end thereof is interiorly threaded, as indicated at 7. The said plug is provided with an opening 10 in its side which is screw threaded, as shown. Another part of the attachment consists of a valve device, comprising the tubular valve holding section 11, one end of which is reduced and screw threaded, as indicated at 12, which end is adapted to engage either the internal screw threads at 7 in one end of the plug 5 or the screw threads of the opening 10 in the side of said device. The outer portion of the interior of the tubular member or section 11 is enlarged and is screw threaded for the reception of an adjustable plug 13, provided with an opening 14 extending longitudinally thereof. Situated within the enlarged portion of the interior of the tubular section 11 is a coiled spring 15, the inner end of which rests upon a shoulder 16 at the lower end of the enlarged portion of the interior of said tube. The opposite or outer end of the said spring bears against a ball valve 17 and tends to hold the same against a seat 18 in the inner end of the adjustable plug 13 to normally close the opening or passageway 14 through the said plug. The inner end of the vacuum tube 4 is provided with a coupling member comprising a screw threaded nipple portion 20 which latter is adapted to engage with the screw threads at 7 or 10, to which reference has already been made.

In Fig. 1 of the drawings, the tubular valve section 11 is connected to the screw

threaded outer end of the plug 5, while the screw threaded nipple 20 of the vacuum tube coupling is connected in the opening 10. In Fig. 2, a reversed connection of the parts is made. In Figs. 3 and 5, the connection of the parts 5, 11 and 20 of the attachment are made in the same manner as in Fig. 2, while in Figs. 4 and 6, the connection of the said parts is made as in Fig. 1.

It will be noted that the nipple 20 of the coupling of the vacuum tube 4 is in engagement with the opening 10 in the side of the plug 5, while the tubular valve holding section 11 is in engagement with the screw threaded interior portion of the outer end of said plug; and that in Figs. 2, 3 and 5 the tubular valve holding section 11 is connected in the opening 10 in the side of the plug 5, while the nipple 20 of the vacuum tube coupling is connected in the screw threaded outer end of the said plug 7.

The above connections of these parts in the several figures are shown for the purpose of indicating the manner in which the assembling of the parts may be made so as to adapt the attachment to different conditions as met with in actual practice.

Generally, the air which is delivered through the valve controlled passageway to the valve holding device is obtained from the immediately surrounding atmosphere, but if preferred, the air which is taken in through the said valve controlled passageway may be preheated. In Fig. 6 I have shown a construction comprising a tubular conduit, one end of which is connected with the outer end of the adjustable plug 13, while the opposite end thereof has connection with the device 21 and is in communication with the interior thereof. The said device is of crescent shape and is provided with flanges, as indicated at 22, the inner edges of which are adapted to be fitted against the outer surface of the exhaust manifold 23 of a gas engine. The fit between the inner edges of the said flanges and the outer surface of said tube is not so close or tight but that air may pass between the said inner edges and the surface of the tube into the crescent shaped chamber of the device 21. The said device 21 is provided at its opposite ends with lugs or ears 24 having openings therethrough, through which the opposite ends of a bar or rod 25 are adapted to project. The said opposite ends are screw threaded and are adapted to be engaged by nuts 26, the tightening of which clamps and binds the crescent shaped air preheating device onto the exhaust manifold 23.

It will be seen that by my invention I have provided an attachment of universal character; that is to say, an attachment, the parts of which may be connected together in different ways or arrangements, in order

that the said attachment may be adapted to meet varying conditions which may be met in actual practice.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. A combined vacuum tube attachment and air inlet device for gas engines comprising a tubular plug, one end of which is adapted to be secured in an opening leading to the interior of a gas engine, the opposite end of which plug is open and which is provided with an opening in its side, an air inlet device adapted to be secured in either of said openings, and a coupling for a vacuum tube having a nipple which is adapted to be secured in either of said openings.

2. A combined vacuum tube attachment and air inlet device for gas engines comprising, in combination, a tubular plug, one end of which is adapted to be connected with the interior of a gas inlet manifold, and the other end of which tubular plug is open and which plug is provided with a lateral opening, a tubular valve holding section which is adapted to be connected with the open outer end of said tubular plug or with the said lateral opening, and a vacuum tube coupling which is adapted to be connected either with the open outer end of said tubular plug or with the said lateral opening.

3. A combined vacuum tube attachment and air inlet device for gas engines comprising a tubular plug, one end of which is adapted to be connected with a gas inlet manifold to communicate with the interior thereof, the opposite end of which is provided with screw threads, which plug is provided with a lateral opening, a valve holding tubular section, one end of which is screw threaded

and adapted to be connected with the open outer end of said plug or with the said lateral opening, a valve mounted in the said valve holding section for closing the opening therethrough, yielding means for yieldingly holding the said valve against a seat, means for varying the tension of said yielding means, and a vacuum tube coupling having a nipple which is adapted to be connected either with the open outer end of said plug or with the said lateral opening.

4. In combination, a tubular plug, one end of which is screw threaded and adapted to engage a screw threaded opening leading into a gas inlet manifold, and the open opposite end of which plug is interiorly screw threaded, and the said plug being provided with a screw threaded opening in its side, a tubular valve holding section, one end of which is reduced and screw threaded, the said reduced screw threaded end portion being adapted to engage either the screw threaded interior of the outer end of said plug or the said screw threaded opening in the side of said plug, a valve mounted in said tubular section for closing the passageway therethrough, yielding means for yieldingly holding the said valve against a seat, means for varying the tension of said yielding means, a vacuum tube, and a coupling having connection with one end of said vacuum tube, which coupling is provided with a screw threaded nipple which is adapted to engage either the outer screw threaded end of said plug or the said screw threaded opening in the side thereof.

In testimony that I claim the foregoing as my invention, I have hereunto signed my name this 5th day of March, A. D., 1925.

BENJAMIN F. LARE.