

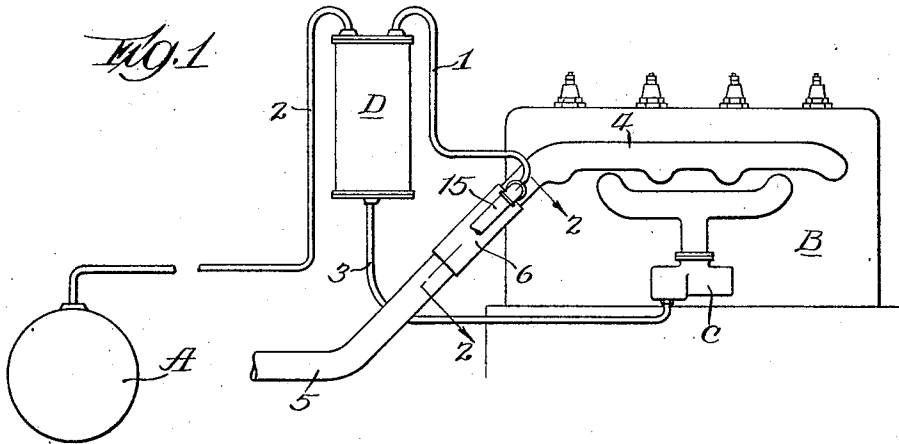
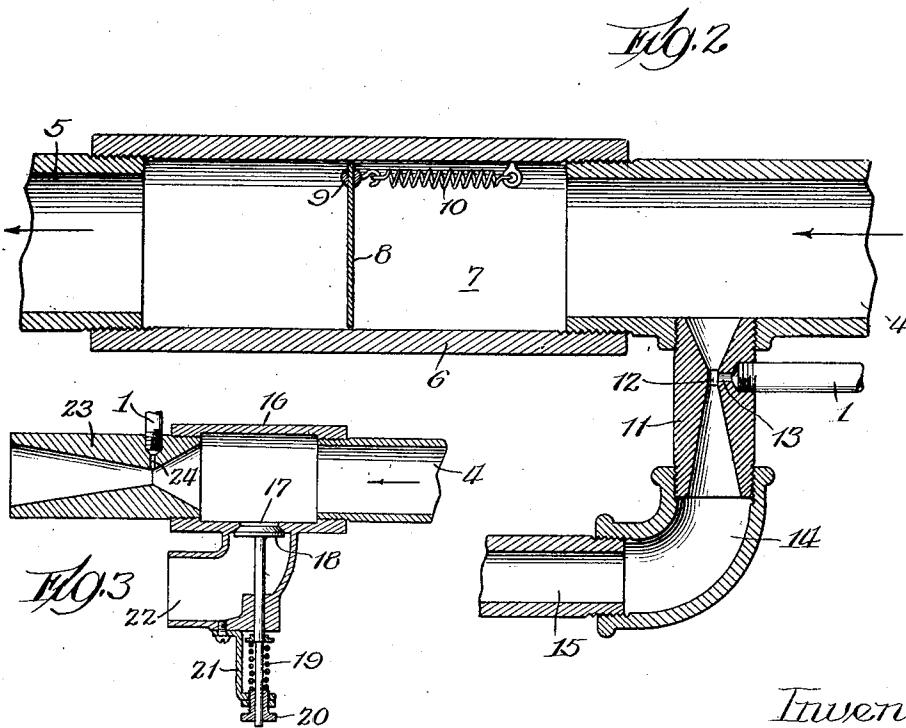
June 26, 1923.

1,459,962

L. H. WHEELER

EXHAUST PRESSURE GOVERNOR FOR SUCTION FEED SYSTEMS

Filed April 14, 1922



Witness:
Conrad M. Olsen

Inventor
Leonard H. Wheeler
by
Burlin & Burlin Attys

UNITED STATES PATENT OFFICE.

LEONARD H. WHEELER, OF CHICAGO, ILLINOIS, ASSIGNOR TO STEWART-WARNER SPEEDOMETER CORPORATION, OF CHICAGO, ILLINOIS, A CORPORATION OF VIRGINIA.

EXHAUST-PRESSURE GOVERNOR FOR SUCTION-FEED SYSTEMS.

Application filed April 14, 1922. Serial No. 552,807.

To all whom it may concern:

Be it known that I, LEONARD H. WHEELER, a citizen of the United States, residing in the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Exhaust-Pressure Governors for Suction-Feed Systems, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

This invention relates to liquid feeding apparatus of the type commonly known as the "vacuum feed," and its purpose is to provide a construction associated with the exhaust pipe or conduit of an engine for utilizing the flow of the exhaust to produce suction or vacuum for operating the feed device. It consists of certain features of construction hereinafter described and shown in the drawings, as indicated by the claims.

In the drawings:—

Figure 1 is a diagrammatic side elevation of a liquid feed system applied to an engine having a suction producing device in the exhaust pipe constructed in accordance with this invention.

Figure 2 is a longitudinal section of the suction producing device taken as indicated at line 2—2, on Figure 1.

Figure 3 is a similar sectional view on a smaller scale, showing a modified form of the invention.

The liquid feed system shown in the drawings comprises the usual low level supply tank, A, which, as illustrated, may be understood as the fuel supply tank for an internal combustion engine shown at B, and having the carbureter, C, to which the fuel is fed by a vacuum feed tank, D, of well understood construction, such as that shown in Jay Patent No. 1,125,549, dated January 19, 1915. As commonly installed at the present time, such a vacuum feed device depends for its suction upon the partial vacuum produced in the intake manifold of the engine. However the suction is derived, the apparatus must include a suction line or pipe, 1, a liquid supply pipe, 2, leading from the low level tank, A, to the vacuum tank, D, and a feed pipe, 3, leading from the tank, D, to the carbureter, C.

The engine exhaust manifold shown at 4 communicates with the exhaust pipe, 5,

through the suction producing device embodying this invention and including a sleeve-like fitting or conduit, 6, which provides a chamber in which the pressure of the exhaust gases from the manifold, 4, is allowed to accumulate against a relief valve or shutter, 8, shown as pivotally hung in the passage or chamber, 7, on a rock shaft, 9, and biased to closed position by means of a spring, 10, extending between a hook rigidly set in the shaft, 9, and an anchor pin or eye secured in the wall of the member, 6. The back pressure thus created is relieved through a Venturi tube, 11, at whose most constricted part, 12, a port, 13, communicates through the pipe, 1, with the vacuum tank, D, and the suction created by the flow of exhaust gas through the venturi thus serves to operate the vacuum tank in a well understood manner for lifting liquid from the supply tank, A, and discharging it through the pipe, 3. The gas escaping through the venturi, 11, is conducted through an elbow, 14, and pipe, 15, to any convenient point of discharge; if desired, it may pass into the usual muffler (not shown) to which the exhaust pipe, 5, will also be coupled.

With this arrangement, it will be seen that the spring controlled valve or shutter, 8, serves to regulate and hold at a substantially uniform value the pressure of the exhaust gases entering the venturi, 11; thus the suction produced in the pipe, 1, will be fairly uniform. When through increased engine speed or for any other reason the pressure in the exhaust manifold, 4, becomes excessive, it will be relieved by the yielding of the shutter valve, 8, permitting a part of the gas to pass through the pipe, 5, while only a sufficient quantity is conducted through the venturi, 11, to maintain the desired uniform pressure and resultant suction.

Figure 3 shows a slight modification in which the sleeve, 16, which is connected to the manifold, 4, is provided with a lateral port, 17, controlled by a valve, 18, shown as of the poppet valve type having a spring, 19, for holding it normally seated. The force of the spring, 19, is rendered variable by means of an adjustable stop screw, 20, against which it reacts and which is carried in the bracket, 21, mounted on the conduit, 22, to which the port, 17, leads when the

valve, 18, is open. Directly aligned with the manifold, 4, and sleeve, 16, is a Venturi tube, 23, having a port, 24, leading laterally from its constricted throatway for connection through the pipe, 1, with the vacuum feed tank, D. In this device the flow of exhaust gas is backed up or retarded somewhat by the presence of the venturi, 23, but this back pressure is prevented from becoming excessive by providing the relief valve, 18, and port, 17, through which a part of the gas may be by-passed by way of the conduit, 22, at any suitable connection to the muffler (not shown). The device will thus tend to maintain a fairly uniform pressure and velocity in the Venturi tube, 23, resulting in a fairly constant suction effect operating through the port, 24, and pipe, 1, to actuate the vacuum feed devices in the tank, D.

I claim:

1. The combination of an internal combustion engine provided with liquid fuel feeding means operated by suction and an exhaust passage comprising two branches, one branch having a venturi with an inlet leading from the fuel feeding means to the

constricted portion of the venturi, and the other branch being provided with a valve yieldingly held in closed position but adapted to open to relieve excessive back pressure in the exhaust passage.

2. In the combination defined in claim 1, the branch having said yielding valve being arranged in the direct line of flow of exhaust gas from the engine and the venturi opening transversely thereinto.

3. In the combination defined in claim 1, said venturi being disposed in the exhaust passage in the direct line of flow of the gas therethrough, and the valve controlling the other branch being arranged to yield in a transverse direction.

4. In the combination defined in claim 1, means for adjusting said valve to regulate the maximum exhaust pressure to be supplied to the venturi for thus maintaining a substantially uniform suction effect upon the fuel feeding means.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 11th day of April, 1922.

LEONARD H. WHEELER.