

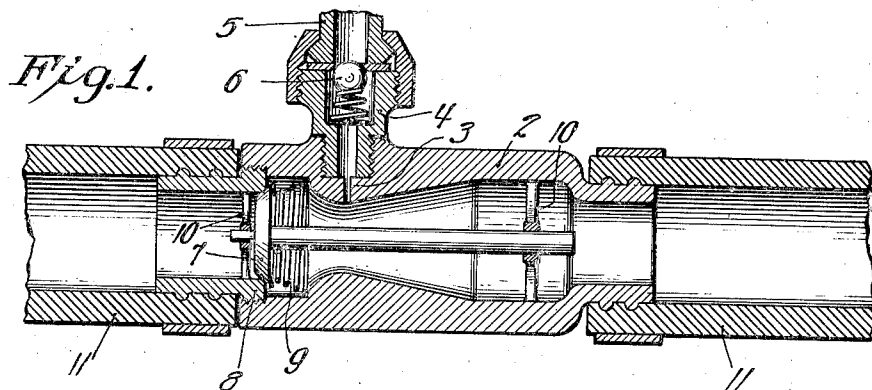
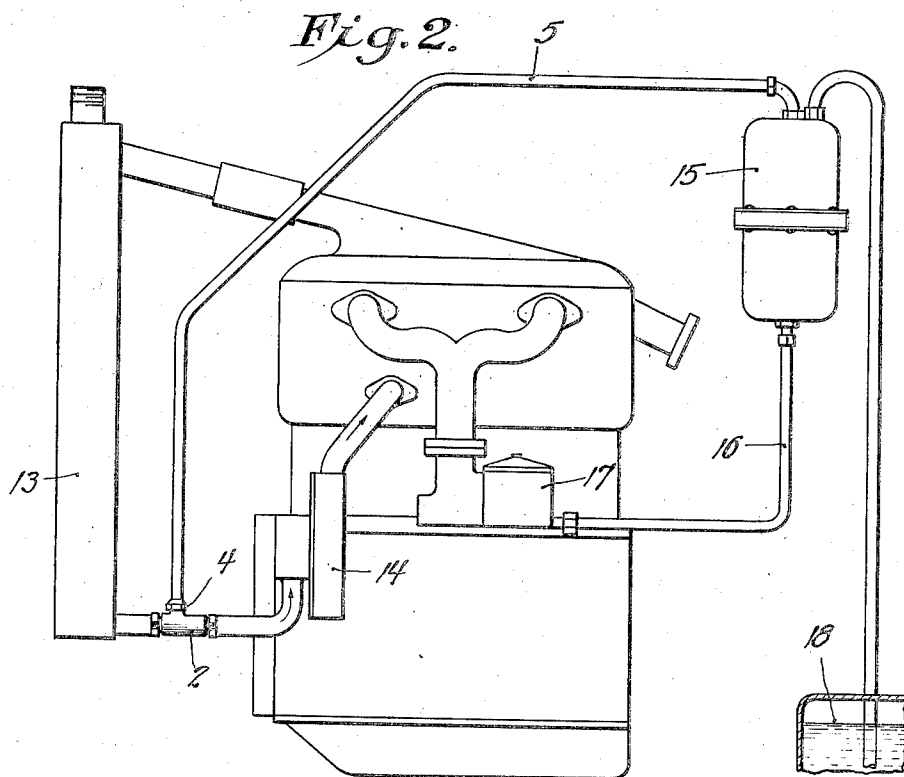
July 21, 1925.

C. C. BRADBURY

1,546,560

VACUUM DEVICE FOR INTERNAL COMBUSTION ENGINES

Filed Nov. 3, 1921



Inventor
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UNITED STATES PATENT OFFICE.

CLIFFORD C. BRADBURY, OF OAK PARK, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO CURTIS B. CAMP, TRUSTEE, OF OAK PARK, ILLINOIS.

VACUUM DEVICE FOR INTERNAL-COMBUSTION ENGINES.

Application filed November 3, 1921. Serial No. 512,517.

To all whom it may concern:

Be it known that I, CLIFFORD C. BRADBURY, a citizen of the United States, and resident of Oak Park, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Vacuum Devices for Internal-Combustion Engines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to apparatus for use in the water circulating system of an automobile to enhance the suction to provide an adequate suction for the operation of a vacuum tank for lifting fuel from the low level supply for delivery to the carburetor by gravity.

The invention comprises a Venturi tube located between the base of the radiator and the intake of the water pump, the part containing the Venturi tube being preferably provided with an automatic restricting valve for assisting in the maintenance of adequate suction.

My invention is illustrated in the accompanying drawings, in which

Figure 1 is a cross section of the Venturi tube and its associated parts; and

Figure 2 is a layout of the power plant of an automobile showing the location therein of the apparatus illustrated in Figure 1.

The flow of water through a Venturi tube creates a suction at or near the throat of the Venturi tube which is far in excess of the suction which causes the flow through the tube. I take advantage of this principle by providing a casing 2 internally formed to a Venturi shape with its throat at 3 connected by a small passageway through the coupling 4 with the suction line 5, there being a check valve 6 included in the coupling permitting flow in the direction toward the Venturi tube only.

The intake to the casing 2 is provided with a valve 7 held against a seat 8 by means of a spring 9, the valve being guided by spiders 10 to hold it centrally within the passage. The casing 2 is preferably formed at each end to fit into rubber hose 11, so that the casing may be readily inserted in the line between the radiator and the pump in existing types of automobiles without elaborate change.

In Figure 2, the casing is shown at 2, where it connects between the radiator 13 and the circulating pump 14. The suction line 5 leading from the connection 4 on the casing 2 extends to the top of a supply tank 15 which delivers fuel through a discharge pipe 16 to a carburetor 17. The fuel is supplied to the tank 15 from a low level source 18, the tank 15 being of any well-known type used for supplying fuel to carbureters.

The water in the circulating system becomes very roily with particles of rust, and in order to prevent these particles from getting into the pipe 5 and clogging it during periods of inoperation of the engine, the check valve 6 is provided, and the casing 2 is preferably installed with the nipple 4 extending in an upwardly direction, as shown, in order that the sediment from the water will not clog the opening through the throat of the Venturi tube or the passage between that opening and the valve 6.

The apparatus just described may be modified by the omission of either the valve 7 or the Venturi tube, or both. If the valve is omitted, an adequate suction will be obtained only at higher engine speed than if the valve is present. If the Venturi tube is omitted, the suction obtainable from the passage will be less and the engine speed will have to be greater to secure adequate suction. If both the Venturi tube and the valve are omitted, the degree of suction obtainable in the casing 2 will depend upon the type of radiator and the consequent resistance to the flow of water through the radiator. In this case, a still higher engine speed is required in order to obtain the necessary degree of suction.

I have found it preferable to make the opening between the coupling 4 and the throat of the Venturi tube very small so that the air will be drawn in very slowly, because, if drawn in too rapidly, air, in the first place, so lightens the water that the suction efficiency of the centrifugal pump is diminished, and, in the second place, the air, upon arrival in the engine jacket, if allowed to enter in too large quantities, expands through heat and displaces an objectionable amount of water.

While I have shown and described my invention with respect to certain details of construction, it is to be understood that cer-

tain of these details may be modified without departing from the spirit or scope of my invention.

I claim:

5 1. In a device of the class described for inclusion between a radiator and the intake of a water circulating pump, an automatically operating valve within the device for restricting the flow of liquid therethrough
10 to create a predetermined suction within the device, and a connection extending from the device to apparatus to receive suction therefrom.

15 2. In a device of the class described for inclusion between a radiator and the intake

of a water circulating pump, an automatically varying valve within the device for restricting the flow of water therethrough to create a predetermined suction within the device, a Venturi tube included in the device, 20 between the valve and the water circulating pump, and a connection from a point near the throat of the Venturi tube to apparatus to receive suction therefrom.

In witness whereof, I hereunto subscribe 25 my name this 1st day of November, 1921.

CLIFFORD C. BRADBURY.

Witnesses:

EDNA V. GUSTAFSON,
EMILE J. BOURGEOIS.