

J. W. PACKARD.
MIXER AND VAPORIZER FOR HYDROCARBON ENGINES.
APPLICATION FILED JUNE 29, 1903.

3 SHEETS—SHEET 1.

Fig. 1.

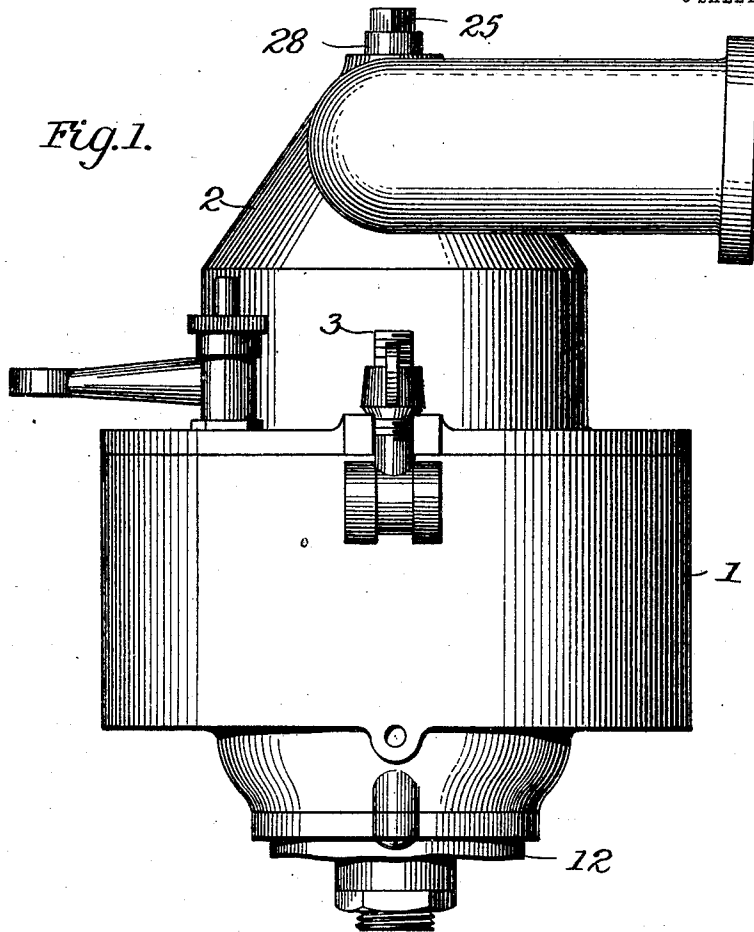
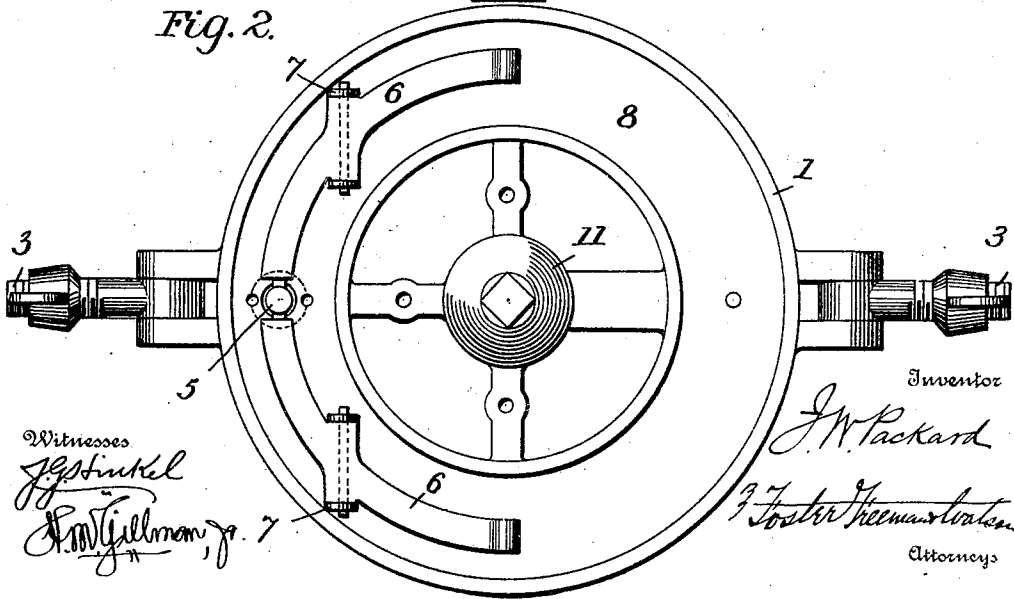


Fig. 2.



Witnesses
J. J. Hinkel
J. M. Gillman, Jr.

Inventor
J. W. Packard
Foster Freeman Watson
Attorney

J. W. PACKARD.

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3 SHEETS—SHEET 2.

Fig. 3.

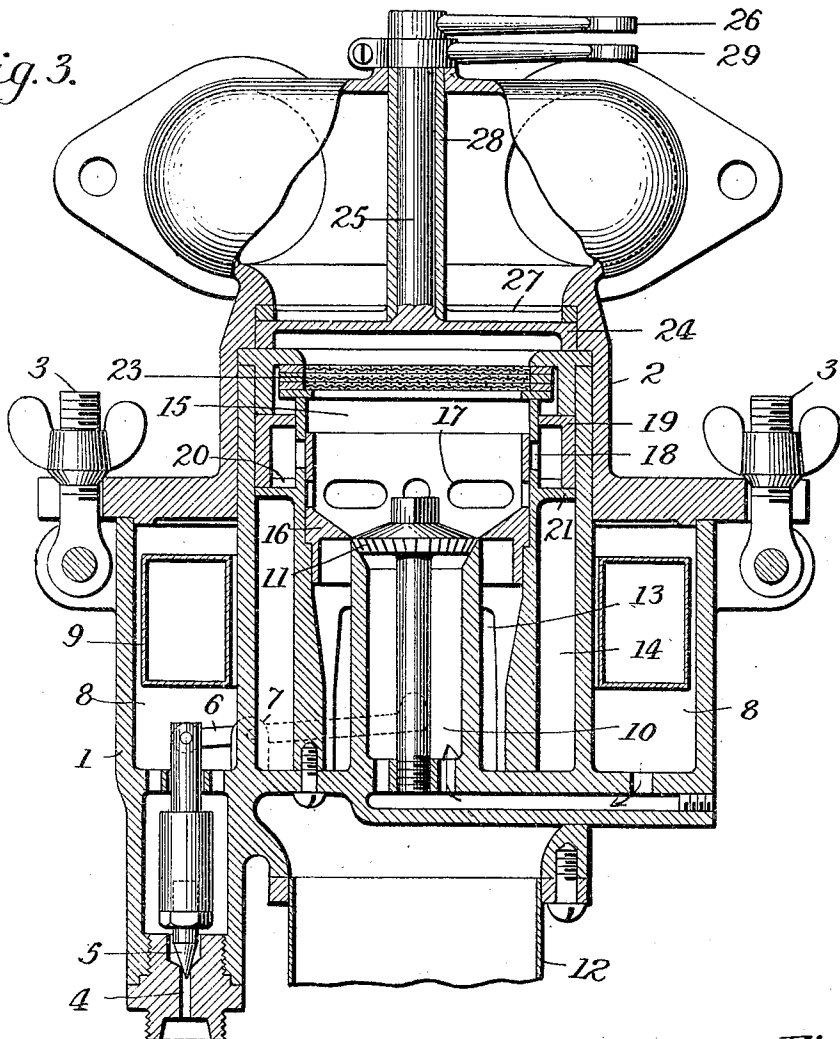


Fig. 4.

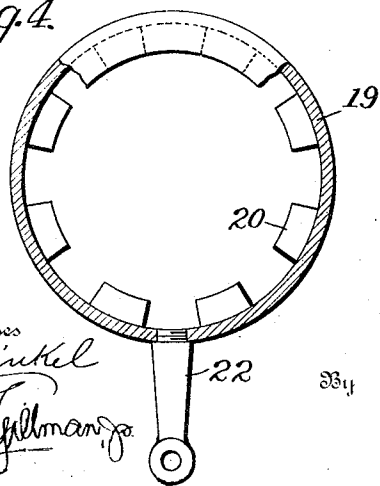
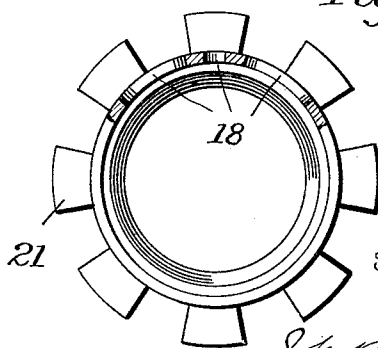


Fig. 5.



Witnesses
J. G. Stuebel
R. J. Gillman

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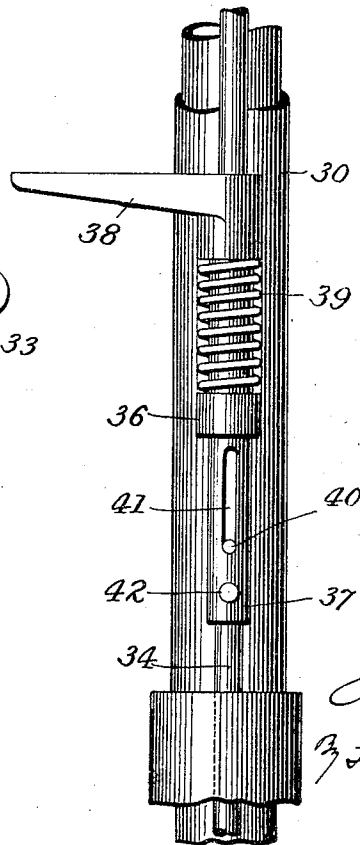
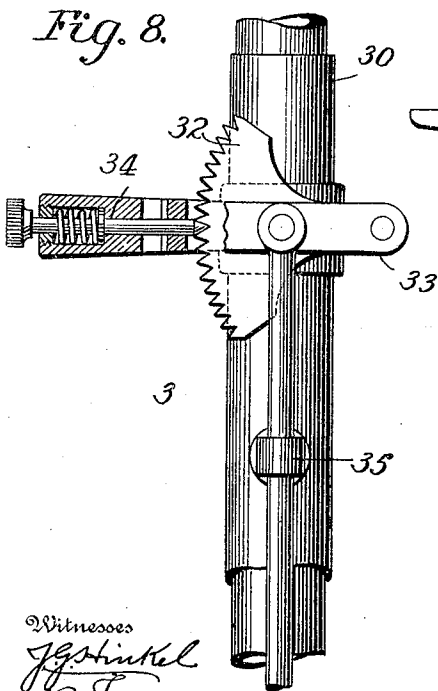
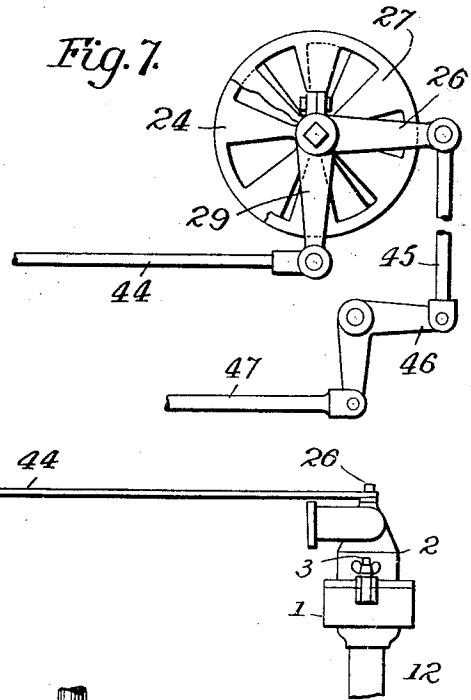
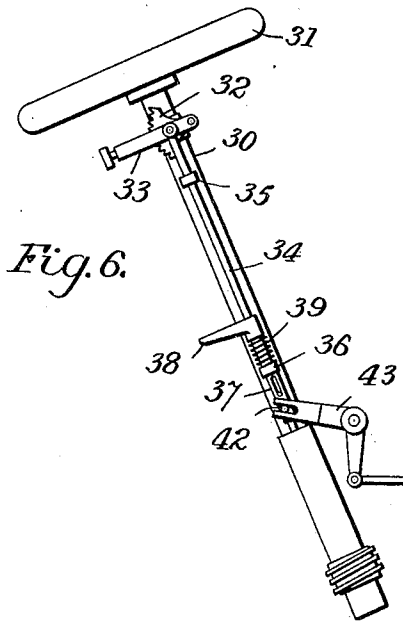
Inventor

J. W. Packard

Foster Furman & Co., Attorneys

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APPLICATION FILED JUNE 29, 1903.

3 SHEETS—SHEET 3.



Witnesses
J. Schinkel
S. Gillman, Jr.

Inventor
J. W. Packard
Foster Heenan & Watson
 Attorneys

UNITED STATES PATENT OFFICE.

JAMES W. PACKARD, OF WARREN, OHIO, ASSIGNOR TO PACKARD MOTOR CAR COMPANY, OF WARREN, OHIO, A CORPORATION OF WEST VIRGINIA.

MIXER AND VAPORIZER FOR HYDROCARBON-ENGINES.

No. 806,830.

Specification of Letters Patent.

Patented Dec. 12, 1905.

Application filed June 29, 1903. Serial No. 163,590.

To all whom it may concern:

Be it known that I, JAMES W. PACKARD, a citizen of the United States, residing at Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Mixers and Vaporizers for Hydrocarbon-Engines, of which the following is a specification.

This invention comprises various improvements in carbureters for hydrocarbon-engines used on motor-vehicles of the class illustrated in United States Letters Patent No. 667,910, dated February 12, 1901.

It is often desirable, on account of varying atmospheric and climatic conditions, to vary the quantity of air admitted to the mixing-chamber with relation to the quantity of hydrocarbon, and it is also desirable to be able to vary the quantity of mixture passing to the engine both automatically and by hand.

The present invention relates to these regulating devices and also to novel means for regulating the gasolene-inlet valve.

The invention will be fully described in connection with the accompanying drawings, in which—

Figure 1 is a side view of a carbureter embodying the invention. Fig. 2 is a plan view of the lower part of the carbureter. Fig. 3 is a section taken on the middle vertical line of Fig. 1. Fig. 4 is a plan view of the auxiliary air-valve. Fig. 5 is a plan view of the seat of said valve. Fig. 6 is a side view of the means for operating the mixture-valve manually. Fig. 7 is a plan view of the mixture-valve, showing connections for operating it manually and automatically; and Figs. 8 and 9 are details of part of Fig. 6.

Referring to the drawings, 1 indicates the lower part of the casing of the carbureter, and 2 the upper part of the casing, these parts being connected by bolts 3 when the apparatus is assembled. The gasolene enters from a suitable reservoir through an opening 4, controlled by valve 5. This valve is connected to a lever 6, which is in the form of a semi-circle and is mounted to rock on bearings 7. The free ends of the lever are preferably located in a diametrical line passing through the center of the apparatus, as shown in Fig. 2. The lever 6 is located in the float-chamber 8, and in said chamber is an annular float 9, nor-

mally resting upon the free ends of the lever. Gasolene passes from the chamber 8 to an inner chamber 10 by passages indicated by arrows and stands substantially at a common level in both chambers. The object of using the annular float is to bring the center of the float as nearly as possible coincident with the chamber 10, so that the level of the gasolene in said chamber will not fluctuate on account of inequalities in the road over which the automobile travels. When the float is to one side of the carbureter, it is found that the level in the compartment 10, from which the gasolene is drawn, will be higher or lower, depending upon whether the vehicle is going uphill or downhill and depending upon other inequalities in the road. This defect is largely corrected by the construction above described. The gasolene is drawn from the compartment 10 through the valve 11 by the suction created by the engine in the usual manner.

The air for the carbureter enters through pipe 12 and passes through openings in the bottom of the casing 1 into inner air-passages 13 and outer air-passages 14. The air passing through the passages 13 enters the mixing-chamber 15 at the upper edge of the circular wall of the gasolene-compartment 10, at which edge it mingles with the gasolene. The upper opening of the compartment 13 is controlled by a sliding valve 16, the opening of which depends upon the speed of the engine—that is, upon the suction created by the cylinders, the valve 16 being free to slide vertically. The valve 16 has lateral openings 17, which register with openings 18 in the inner wall of the compartment 14 when the valve is raised to its extreme limit by suction, in which case additional quantities of air are drawn in from the compartment 14. In order to regulate the quantity of air which may be drawn from the compartment 14, a circular air-valve 19 is provided. As shown in Figs. 3 and 4, this valve has a series of inwardly-projecting plates 20, which cooperate with a series of plates 21, projecting from the inner wall of compartment 14. These plates 20 21 form a multiple valve, which is opened and closed by means of a lever 22, connected to the ring 19. The ring 19 is set to open the valve to the necessary degree to provide a proper mixture of air and hydrocarbon, and it only requires to be readjusted when

atmospheric or climatic conditions affect the quality of the mixture.

Above the mixing-chamber are a series of screens 23 to more effectually mix the air and gasolene, and above the screens is a mixture-valve having two movable parts of similar construction. As shown, these parts are circular plates having radial openings and rotating about a common center, and they may be said to constitute two valves. The under valve 24 is provided with a spindle 25 and a lever 26. The upper valve-section 27 is connected with a hollow spindle 28, surrounding the spindle 25 and is operated by a lever 29.

In Figs. 6 to 9, inclusive, is shown apparatus for setting the valve 27 for the opening required for any desired speed. On the sleeve 30, which carries the shaft of the steering-wheel 31, is mounted a toothed sector 32. Pivoted to this sector is a lever 33, carrying a spring locking-pawl 33^a, cooperating with the teeth of the sector. By means of the locking-pawl the lever 33 can be set at any desired angle. Connected to the lever 33 is a rod 34, extending through fixed guides 35 36. Sliding upon the rod is a sleeve 37, surrounding the rod 34 and sliding within the guide 36. On the upper end of the sleeve 37 is fixed a handle or pedal 38, and between the hub of 38 and the guide 36 is a spring 39, which normally holds the sleeve 37 in its uppermost position, which position is determined by a pin 40, extending from rod 34 through a slot 41 in sleeve 37. On lower end of sleeve 37 is a pin 42, which engages the forked arm of an elbow-lever 43, the other arm of which is connected by a rod 44 with the lever 29, which operates the valve 27. It will be evident that the valve 27 may be set to any desired opening by the lever 33. When it is desired to open the valve temporarily to a greater extent for a temporary increase of speed or power, the pedal 38 is pushed down, compressing spring 39 and rocking the lever 43. When the pedal is released, the spring 39 immediately restores the parts to the position determined by the lever 33.

The operating-arm 26 of the under valve 24 may be operated either by hand or by a governor. As shown, it is operated through link 45, elbow-lever 46, and a link 47. As stated, it may be connected to a governor, in which case the amount of mixture admitted to the cylinder will be regulated automatically by a governor. If desired, the valve 24 may be manually controlled or in some instances it may be locked in position.

It will be evident that the construction and arrangement of parts herein described may be varied to some extent without departing from the scope and spirit of the invention, and hence it is to be understood that the invention is not limited to the precise construction illustrated and described.

Having described my invention, what I

claim, and desire to secure by Letters Patent, is—

1. In a hydrocarbon-engine, a mixer and vaporizer comprising a gasolene-inlet, a casing surrounding said inlet, an air-valve, adapted to be operated by suction, arranged about the gasolene-inlet within said casing, a second air-valve arranged outside of said casing, and means for manually operating said second air-valve, said air-valves being arranged to control independent supplies of air to the mixing-chamber.

2. In a hydrocarbon-engine, a mixer and vaporizer comprising a gasolene-inlet, a cylindrical casing surrounding said inlet and provided with air-ports, an air-valve, arranged within the casing to move longitudinally thereof, a second air-valve surrounding said casing, and means for rotating said second valve, said air-valves being arranged to control independent supplies of air to the mixing-chamber.

3. In a hydrocarbon-engine, a mixer and vaporizer comprising a gasolene-inlet, a casing surrounding said inlet and having an outwardly-projecting annular flange, a suction-valve arranged within the casing and having an apertured section adapted to control the admission of air through ports formed in said casing between the inner end thereof and the annular flange thereon, and a manually-operated valve for controlling the passage of air through ports formed in said flange.

4. In a hydrocarbon-engine, a mixer and vaporizer comprising the gasolene-inlet valve 11, the annular suction-valve 16 having a lateral opening 17, and the annular valve 19 surrounding said suction-valve and controlling the supply of air to said lateral openings.

5. In a hydrocarbon-engine, the combination with the mixer and vaporizer of a mixture-valve, means for locking said valve in a given position, and means whereby said valve may be temporarily shifted without disturbing said locking means.

6. In a hydrocarbon-engine, the combination with a mixer and vaporizer, of a mixture-valve, a locking device for said valve, connections between said locking device and said valve including a spring portion and means for compressing the spring to temporarily shift the valve without disturbing the locking means.

7. In a hydrocarbon-engine, the combination with the vaporizer and mixer, of a mixture-valve, means for locking said valve normally in any desired position, and means whereby the valve may be temporarily opened without disturbing the locking means comprising the rod 34, sleeve 37, spring 39, stop 40, and means for compressing the spring and moving the sleeve.

8. In a hydrocarbon-engine, the combination with a mixer and vaporizer, of a mix-

ture-valve comprising two independently-movable parts, means for locking one of said parts in any desired position, and connections for moving the other part as desired.

5 9. In a hydrocarbon-engine, the combination with a mixer and vaporizer, of a mixture-valve comprising two relatively movable parts, means for locking one of said parts in any desired position, means whereby said
10 part may be temporarily shifted without dis-

turbing said locking means, and independent means for moving the other part of said valve.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES W. PACKARD.

Witnesses:

S. D. WALDON,
RUSSELL HUFF.