

No. 713,146.

Patented Nov. 11, 1902.

W. M. POWER.  
VAPORIZING CARBURETER.

(Application filed Dec. 27, 1900.)

(No Model.)

Fig. 3

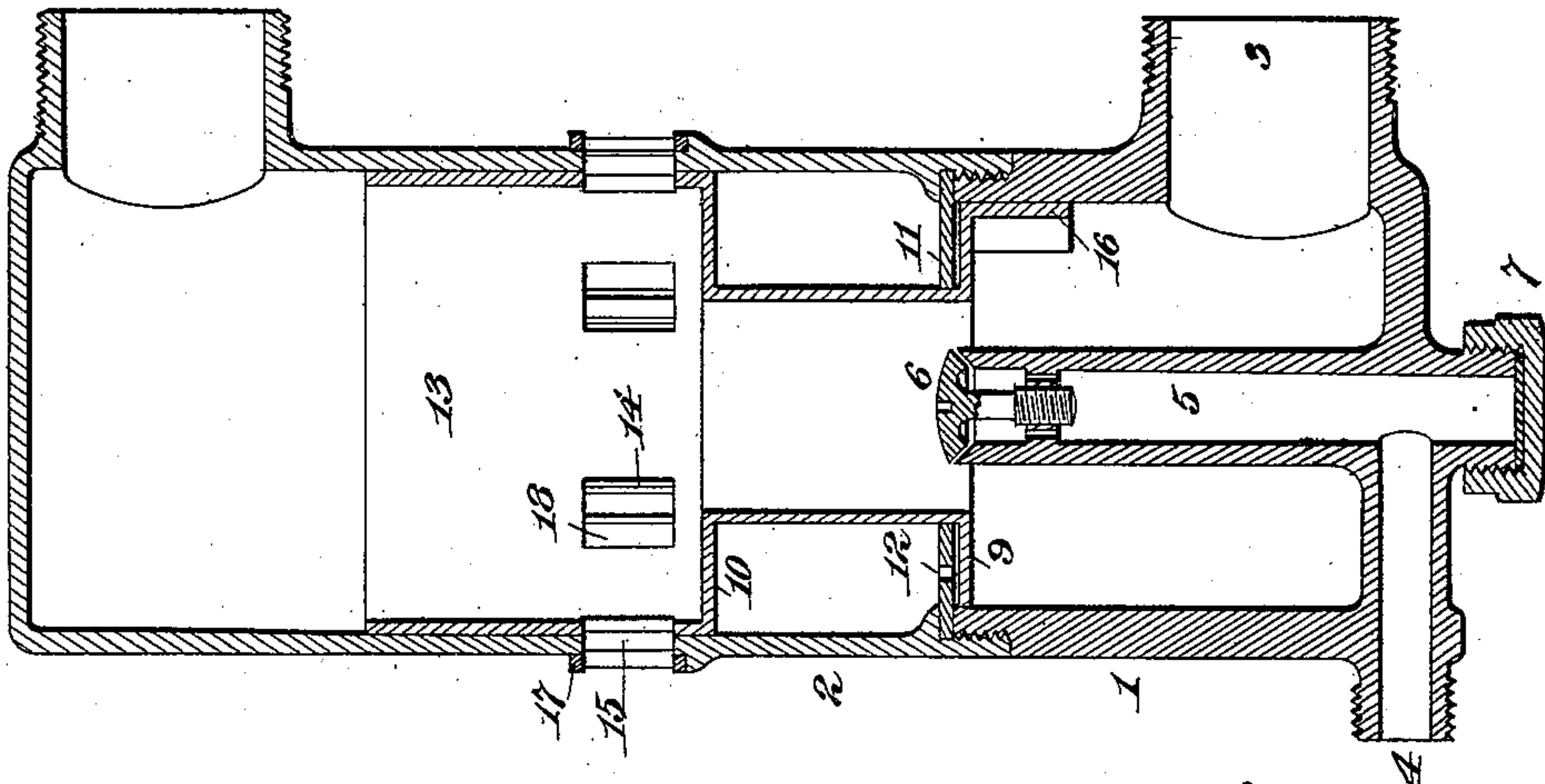


Fig. 2

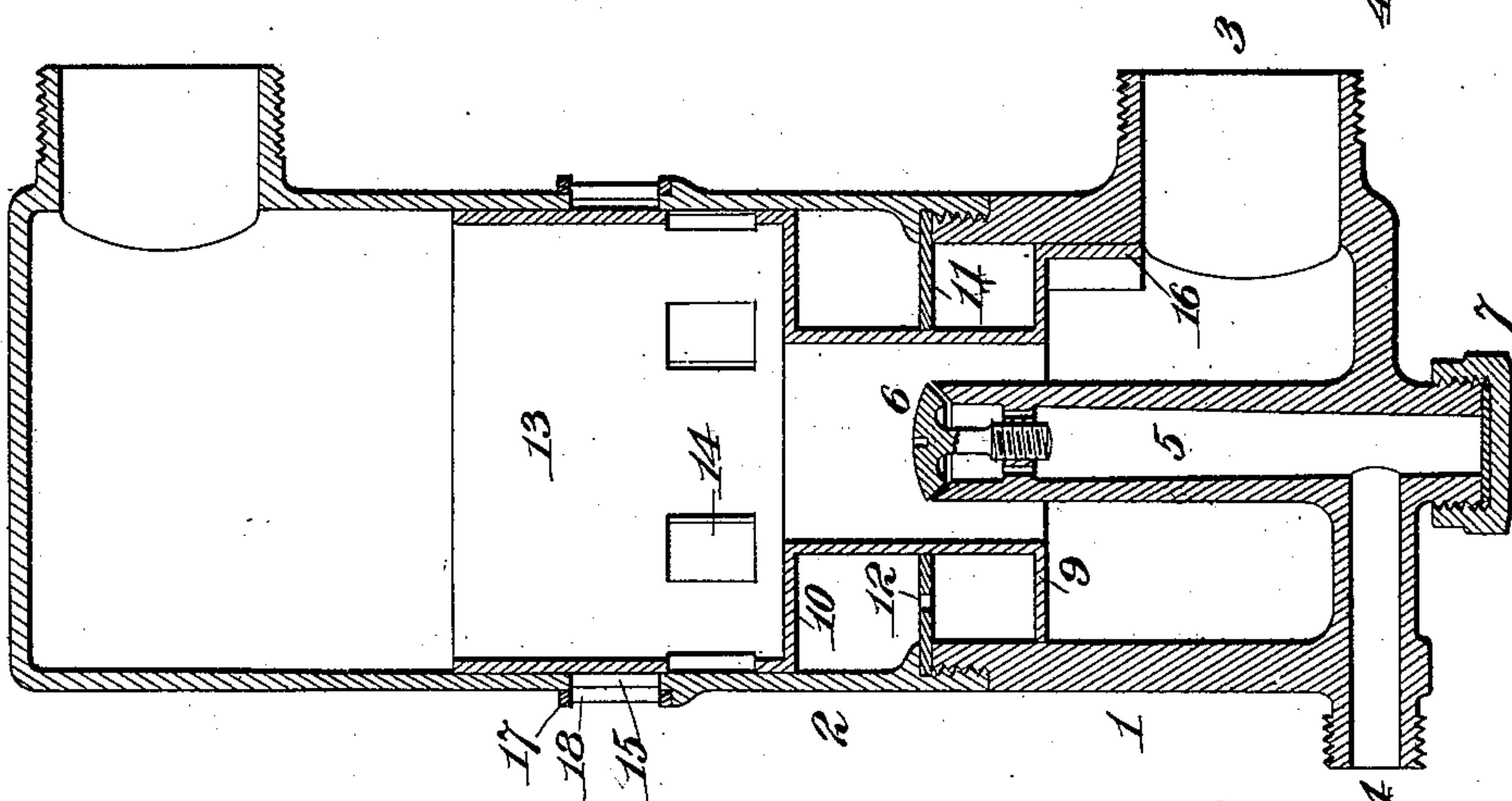
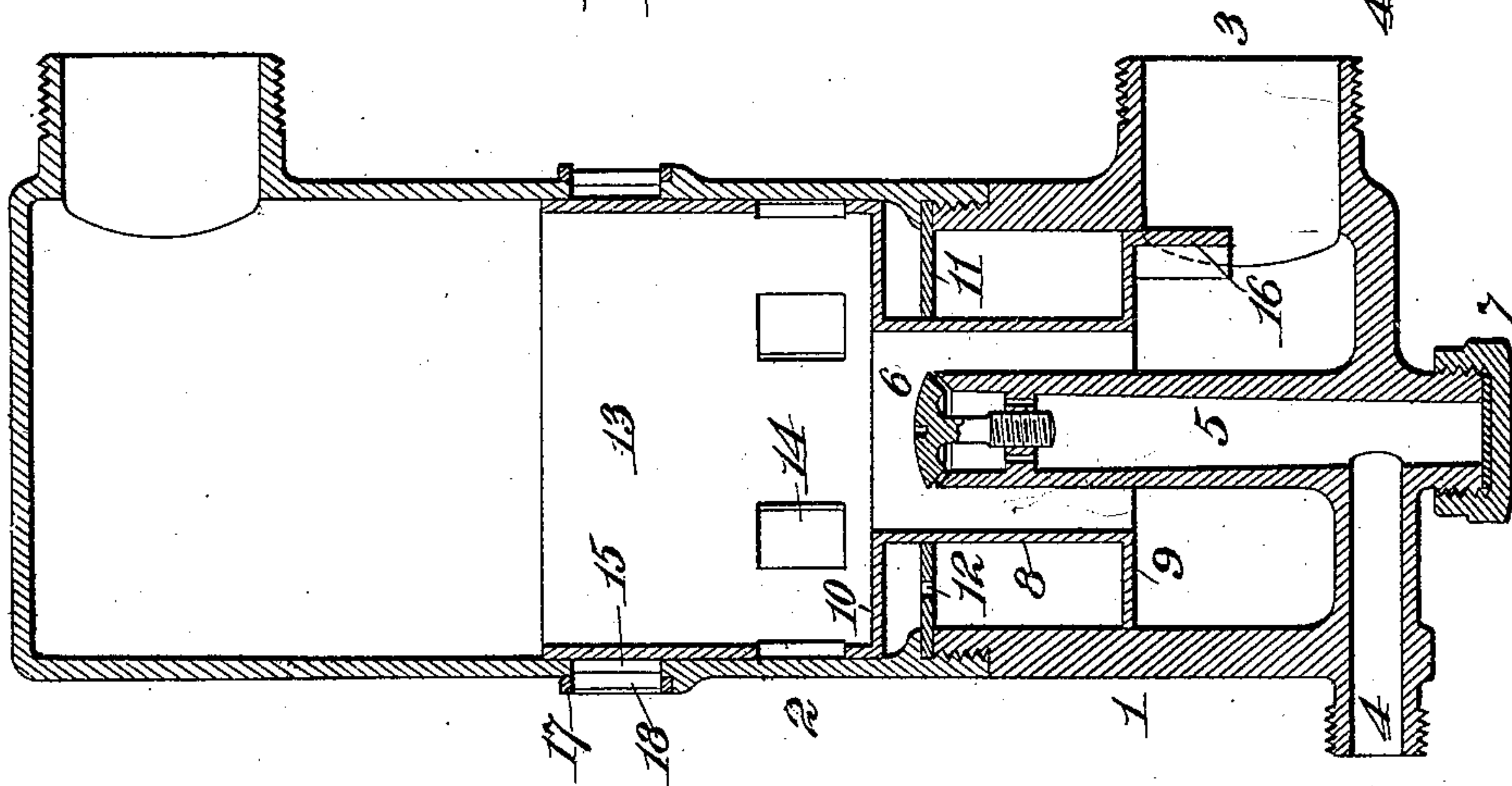


Fig. 1



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## VAPORIZING-CARBURETER.

SPECIFICATION forming part of Letters Patent No. 713,146, dated November 11, 1902.

Application filed December 27, 1900. Serial No. 41,254. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM M. POWER, a citizen of the United States, residing at Montclair, in the county of Essex and State of New Jersey, have invented a certain new and useful Improvement in Vaporizing-Carbureters, of which the following is a specification.

My invention relates to improvements in vaporizers for carbureting air for use in internal-combustion engines. In the operation of internal-combustion engines it is desirable that when the engine is started the proportion of the hydrocarbon in the explosive mixture shall be relatively high, while after the engine is operating and the cylinder and piston are hot the proportion of hydrocarbon in the mixture should be decreased. It is therefore the practice at the present time to manually actuate the vaporizing-carbureters now used, so that when the engine is started a relatively greater amount of the hydrocarbon is brought into contact with the air, which result is usually effected by manually depressing the float which controls the level of the hydrocarbon in the vaporizing-nozzle and after the engine has started permitting the float to regain its normal position. In the operation of these engines it has been observed that as the velocity of air passing through the carbureter increases a disproportionately large amount of the hydrocarbon will be vaporized, so that when the engine is operating at a relatively high speed, with the throttle open to the maximum extent, the mixture will be too rich to secure the best results. It is therefore the practice at the present time to manually operate a hydrocarbon-valve to reduce the feed of the liquid as the velocity of air passing through the carbureter increases, although such operations will manifestly be attended with imperfect results.

The object of my invention is to provide an improved vaporizing-carbureter by means of which either, but preferably both, of these operations will be automatically performed, whereby when the mixture has been once determined the engine may be operated under theoretically perfect conditions at all speeds.

I prefer to construct my improved vaporizing-carbureter as stated, so that both of the operations will be automatically carried out, the device permitting an abnormally rich mixture to enter the engine-cylinder at the commencement of the starting operation, while after the engine starts to operate effectively the proper proportion of the hydrocarbon and air will be maintained approximately constant irrespective of any change in the velocity of air passing through the carbureter. It is, however, not strictly necessary to construct the device so that it shall be capable of performing both of these operations, and a vaporizing-carbureter can be made with advantage which performs either of them and when so constructed is included in the scope of my invention.

Broadly stated, my invention comprises a vaporizing-carbureter of any desired type arranged so that air will be drawn by suction around a vaporizing-nozzle, so as to be effectively carbureted, and a regulating-valve being employed, the position of which is dependent upon the velocity of air passing through the carbureter, which regulating-valve automatically permits a gradual dilution of the mixture to be effected as the speed increases to thereby counteract the increase in the proportion of hydrocarbon due to an increase in the velocity of the air passing through the carbureter.

My invention also preferably contemplates the addition of a throttling device upon the regulating-valve, the former being so arranged with reference to the main air-inlet opening that at the commencement of the operation a limited air-supply will be permitted to enter the carbureter, which, meeting with the normal supply of hydrocarbon, will be consequently highly carbureted, and hence in the best condition for use in the starting operation.

In order that the invention may be better understood, attention is directed to the accompanying drawings, forming a part of this specification, and in which—

Figure 1 represents a sectional view of a vaporizing-carbureter embodying my present



improvements and showing the parts in the position which they assume at the starting operation; Fig. 2, a similar view illustrating the regulating-valve in position to open the  
 5 main air-inlet to its maximum extent, but keeping closed the auxiliary air-openings for diluting the mixture; and Fig. 3, a corresponding view illustrating the position of the carbureter when the engine is running at high  
 10 speed and where a dilution of the mixture is desirable.

In the views corresponding parts are represented by the same numerals of reference.

The casing of the carbureter is made of two  
 15 parts 1 and 2, screwed together, as shown, the section 1 being provided with a main air-inlet 3 and an inlet 4 connecting with the vaporizing-nozzle 5. At the top of the nozzle is a plug 6 for properly spraying the hydro-  
 20 carbon in the usual way. The bottom of the nozzle is provided with a removable plug 7 for the purpose of cleaning. Mounted in the casing of the device is a regulating-valve, comprising, preferably, a tubular body 8 and  
 25 flanges 9 and 10. Preferably a disk 11 is seated between the sections 1 and 2 of the casing and surrounds the tubular body of the valve, said disk being provided with one or more openings 12 therein, whereby the  
 30 movements of the valve will be retarded and sudden fluctuations thereof prevented. The upper flange of the valve carries a skirt 13, having a series of openings 14 therein adapted to register with openings 15 in the  
 35 body of the casing when the valve is elevated. The lower flange 9 of the regulating-valve preferably carries a diaphragm 16, which partly throttles the main air-opening 3, so that at the starting operation a limited amount  
 40 of air will be permitted to enter the carbureting-chamber. If desired, a ring 17, having openings 18 therein, may be mounted on the section 2 of the carbureter, so that by moving said ring radially the effective area  
 45 of the openings 15 can be varied to suit the conditions of actual use. The upper end of the carbureter connects as heretofore with the engine-cylinder, so that at each suction-stroke air will be drawn through the carbureter for carburization. The liquid hydro-  
 50 carbon is fed to the vaporizing-nozzle 5 from a suitable tank in the usual way, and the proper level of the hydrocarbon is maintained by the customary float or by any other suitable device.

At the commencement of the operation the regulating-valve will occupy its lowermost position, as shown in Fig. 1, the diaphragm 16 partially throttling the main air-opening 3.  
 60 When the engine starts to operate, therefore, air drawn through the air-opening 3 around the vaporizing-nozzle will be of limited quantity, and since the normal supply of hydrocarbon will be furnished thereto at the nozzle this air will be highly carbureted, and hence will be in the best possible condition for

introduction into the cold cylinder. When, however, the engine starts in its operation, the air flowing through the carbureter will elevate the regulating-valve, so as to with-  
 70 draw the diaphragm 16 from its registering position with respect to the main air-inlet. As the speed of the engine tends to increase, or if the throttle be opened to its full extent to permit the velocity of air passing through  
 75 the carbureter to increase and to thereby tend to carburet the air with a disproportionately large amount of the hydrocarbon, the regulating-valve will be further elevated to register the openings 14 and 15 and permit a  
 80 greater or smaller quantity of additional air to dilute the explosive mixture and thereby maintain the proportion of hydrocarbon in the mixture substantially constant, it being obvious that as soon as these openings begin  
 85 to register to reduce the partial vacuum in the carbureter the further elevation of the regulating-valve will be relatively slower in proportion to the speed than at the commencement of the operation. In other words, when  
 90 the engine starts from rest the regulating-valve will move readily to the position shown in Fig. 2, since all of the air passing through the carbureter will tend to elevate the valve. When, however, the regulating-valve reaches  
 95 the position shown in Fig. 3, to thereby register the openings 14 and 15, its upward movement will be relatively less for each increment of increase of the speed.

Having now described my invention, what  
 100 I claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination with a vaporizing-carbureter chamber and a vaporizing-nozzle  
 105 mounted concentrically therein, of a valve mounted in the chamber and surrounding the nozzle, a perforated skirt carried by the valve and registering with openings in the carbureter-chamber, and a perforated ring adjustably mounted with respect to said openings  
 110 to vary the size thereof, a main air-inlet and a flange also carried by the said valve for regulating the size of the said main air-inlet.

2. The combination with a vaporizing-carbureter chamber and a vaporizing-nozzle  
 115 mounted concentrically therein, of a valve mounted in the chamber and forming a free air-passage around the said nozzle, a perforated skirt carried by the valve and registering with openings in the carbureter-chamber,  
 120 and a perforated ring adjustable with respect to said openings to vary the size thereof, a main air-inlet located at a point below the said nozzle and a flange also carried by the said valve for regulating the size of the said  
 125 main inlet.

3. The combination with a vaporizing-carbureter chamber, a vaporizing-nozzle mounted therein, and a main air-inlet opening into the chamber below said nozzle, of a regulat-  
 130 ing-valve mounted in the chamber and surrounding the nozzle, and a diaphragm carried



by said valve and normally partially throttling the main air-inlet, substantially as and for the purposes set forth.

4. The combination with a vaporizing-carbureter, of a regulating-valve for permitting the introduction of an additional air-supply into the carbureter, means governed by the velocity of air passing through the carbureter for actuating said regulating-valve, and a diaphragm carried by said valve and normally partially throttling the main air-inlet into the carbureter, substantially as and for the purposes set forth.

5. The combination with a vaporizing-carbureter, of a regulating-valve mounted therein for permitting the introduction of an additional air-supply into the carbureter, means governed by the velocity of air passing through the carbureter for actuating said regulating-valve, and a diaphragm carried by the valve and normally partially throt-

ting the main air-inlet into the carbureter, substantially as and for the purposes set forth.

6. The combination with a vaporizing-carbureter, of a regulating-valve mounted therein for permitting the introduction of an additional air-supply into the carbureter, means governed by the velocity of air passing through the carbureter for actuating said regulating-valve, a diaphragm carried by the valve and normally partially throttling the main air-inlet into the carbureter, and a perforated ring for varying the inlet area for the additional air-supply, substantially as and for the purposes set forth.

This specification signed and witnessed this 20th day of December, 1900.

WILLIAM M. POWER.

Witnesses:

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