F. G. FOLBERTH.

CARBURETER

APPLICATION FILED JUNE 13, 1910.

996,981.

Patented July 4, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

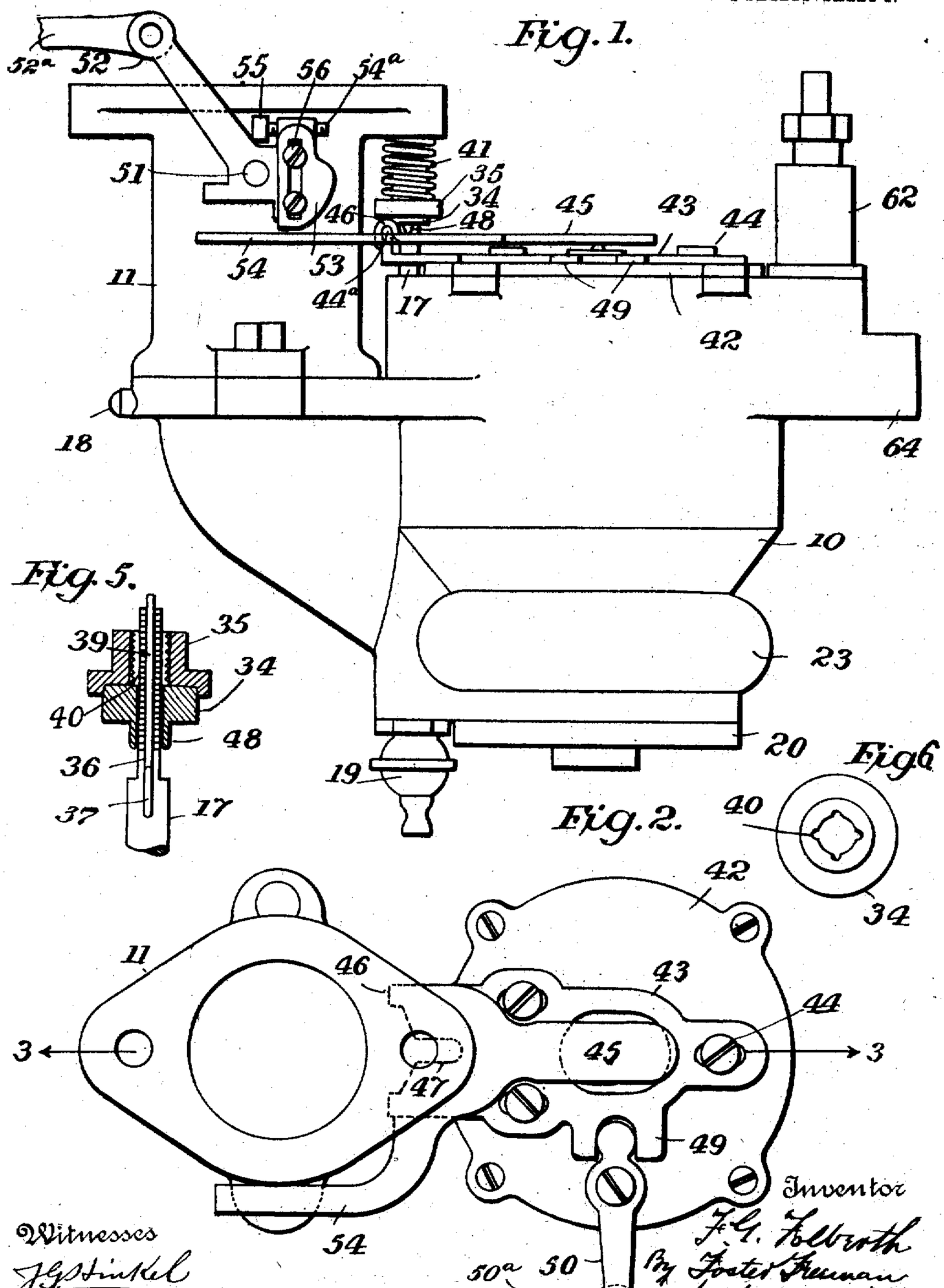

Fig. 5.

Fig. 2.

Fig 6

Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

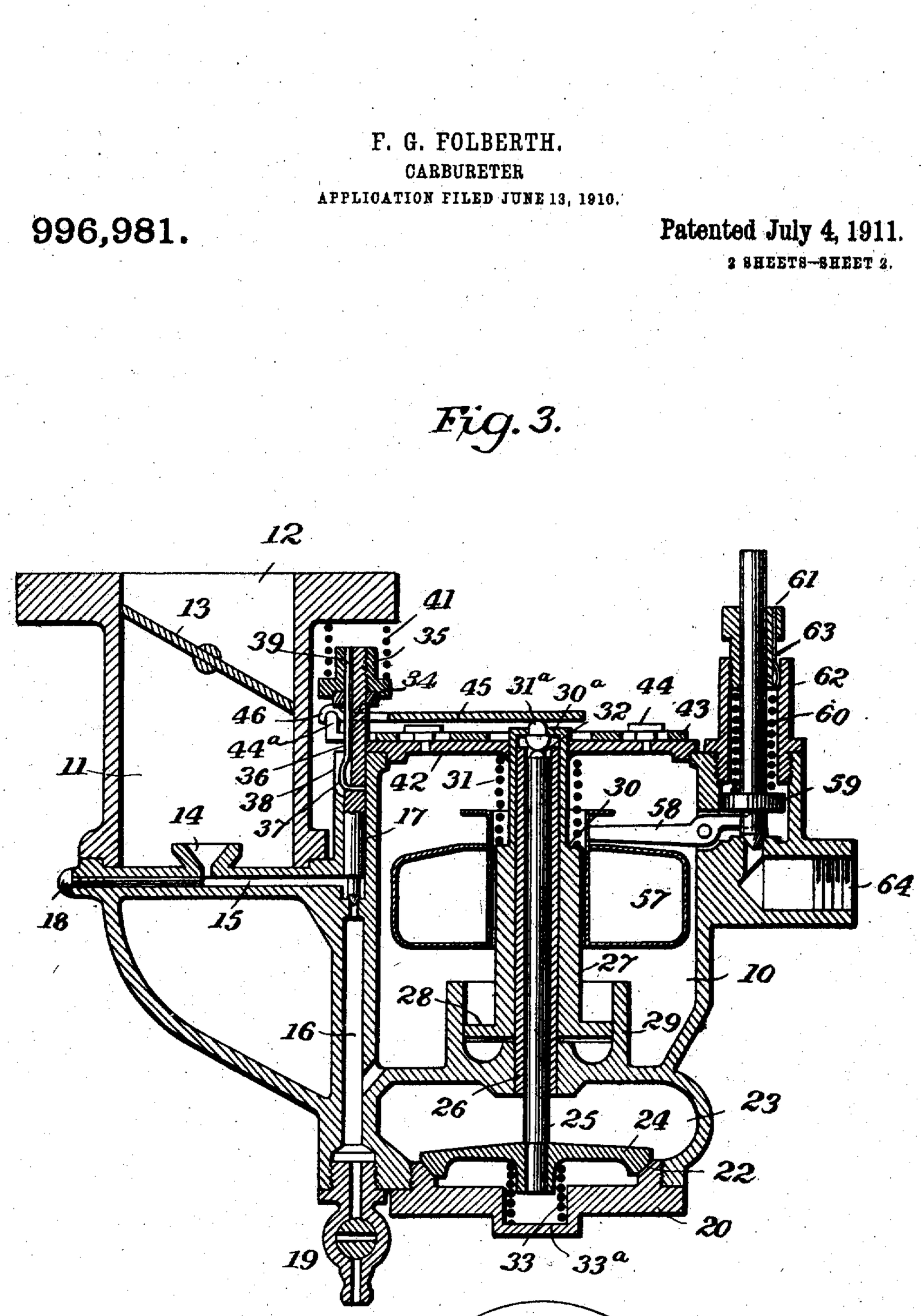
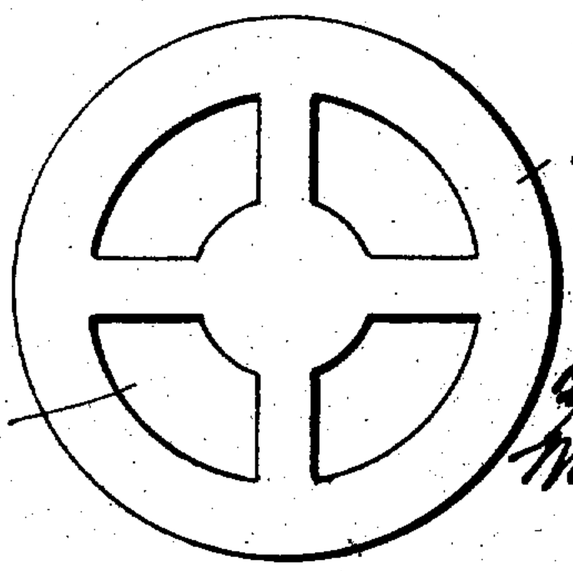


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CARBURETER.

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To all whom it may concern:

Be it known that I, FREDERIC G. FOLBERTH, a citizen of the United States, and resident of Cleveland, county of Cuyahoga, State of Ohio, have invented certain new and useful Improvements in Carbureters for Hydrocarbon-Engines, of which the following is a specification.

This invention relates to carbureters arranged to supply an explosive mixture to hydrocarbon engines.

One of the objects of this invention is to construct a carbureter which is arranged to supply a predetermined quality of mixture to the engine, the proper proportions being automatically regulated and controlled by the suction of the engine.

Another object is to provide means whereby the quality of the mixture may be both automatically and manually controlled and regulated.

Another object is to provide means whereby a proper rich mixture may be supplied to the engine at starting.

Another object is to construct the automatic controlling mechanism so that it will be guarded against vibrations.

Further objects will appear from the detail description, taken in connection with the accompanying drawings, in which—

Figure 1 is an elevation of the carbureter; Fig. 2 is a plan view; Fig. 3 is a section on the line 3—3, Fig. 2; Fig. 4 is a detail view showing the air intake plate; Fig. 5 shows a detail view of the fuel nozzle; and Fig. 6 shows a detail view of the adjusting nut.

The carbureter comprises a casing forming a float chamber 10, a carbureting chamber 11, and a mixture pipe 12 provided with flanges which are arranged to be connected to the intake manifold. The mixture pipe is provided with the usual butterfly throttle valve 13 and the carbureting chamber with a fuel nozzle 14 connected by channels 15 and 16 to the float chamber 10. The supply of fuel from the float chamber is controlled by means of a fuel needle valve 17. The passage 15 is formed by boring, and the end of the passage is closed by a removable plug 18. The passage 16 is provided with a removable drain valve 19 so that by means of this construction, all the passages can be easily formed and cleaned when desired. An air intake plate 20 of spider form is provided with holes 21, and a valve seat 22. The carbureter casing is provided with a chamber 23 below the float chamber, and in this chamber is located an intake valve 24 coöperating with the seat 22, and provided with a stem 25 extending through a tube 26 in the float chamber. This tube 26 may be secured in place in any suitable manner, either by a driven joint or by a screw joint. A sleeve 27 slides upon the tube 26 and is provided with a plunger 28 sliding in a cylinder portion 29 in the valve casing. This sleeve 27 is reduced in diameter so as to form a shoulder 30 against which bears one end of the spring 31, the other end bearing against the cover for the float chamber. The end 30^a of the sleeve 27 is bored and provided with a button 31^a rounded at both ends and arranged to be engaged at the lower end by means of a button or rounded portion 32 on the stem 25 of the intake valve. A spring 33 is located in a recessed portion 33^a of the intake plate 20 and bears against the lower face of the valve 24.

The stem of the needle valve 17 has slidingly mounted upon it a ring 34 which is arranged to be adjusted by means of a nut 35 having a threaded engagement with the upper end of the valve stem. A locking device consisting of a spring 36 is secured to the stem and projects outwardly therefrom as shown at 37, so as to engage a slot 38 in the carbureter casing, so as to prevent the valve stem from turning. The valve stem is provided with a slot as shown more clearly in Fig. 3, arranged to receive the spring locking device so that the end 39 thereof may move inwardly toward the center of the stem. The nut 35 is provided with a plurality of recesses 40 which are arranged to be engaged by the end 39 of the locking device so as to hold the nut yieldingly in adjusted position. By means of this construction, the nut can be rotated, the spring locking device moving inwardly when force is applied to rotate the nut, but the locking engagement between the end 39 and the recesses 40 is sufficient to hold this nut yieldingly in locked position. A spring 41 is mounted between the flange of the mixture pipe and the nut 35 so as to yieldingly hold the valve 17 closed.

The float chamber cover 42 has slidingly mounted upon it a support or plate 43 which

is guided by means of the shanks of screws 44 engaging slots in the support or plate 43. The plate 43 is forked and is provided with trunnions or lugs 44ª; and a lever 45 is provided with coöperating recesses 46 which engage the lugs 44ª so that the lever 45 is pivotally mounted upon the plate 43. The right hand end of the lever bears upon the upper rounded surface of the button 31ª. The lever 45 is also forked so as to provide a slot 47 which engages the flattened surfaces of the valve stem, and the ring 34 is provided with trunnion lugs 48 which bear upon the upper surface of the lever. The plate 43 is provided with a forked portion 49 engaged by one end of a lever 50 pivoted upon the cover 42.

The throttle shaft 51 has mounted upon it a lever 52 which has secured to it a cam 53 arranged to engage an arm 54 on the lever 45. The lever 52 is provided with an adjustable stop 54ª which is arranged to engage a stop 55 upon the carbureter body. The cam 53 is adjustably mounted upon the lever 52 by means of screws 56 engaging a slot on the cam.

The float 57 is mounted upon the sleeve 27 and engages one end of a lever 58, the other end of which engages a flange 59 on a needle valve. The stem of the needle valve has mounted upon it a spring 60 bearing against the flange and a nut 61, having a threaded connection with a part 62 connected to the carbureter casing. The nut is arranged to be held in adjusted position by a yielding locking device 63 similar to that shown in the needle valve, the part 62 being provided with a number of recesses which are yieldingly engaged by this yielding locking device. The needle valve is arranged to control the flow of fuel from the main supply connected to a boss 64 on the carbureter casing.

The springs 31 and 41 are constructed and proportioned to overpower the spring 33 so as to normally hold the intake valve and the fuel valve closed. When, however, the engine is in operation, the intake valve will be opened due to the suction of the engine, and due to the interconnection of the intake and fuel valves, these valves will be opened in the same proportion. In order that the proportion between these valves and therefore the quality of the mixture may be varied, the support 43 for the lever 45 is arranged to be adjusted and controlled on the cover 42 so as to vary the ratio of the lever arms with respect to the fuel valve and the intake valve. Thus by moving the support or plate 43 to the left, the lever arm of the fuel valve will be increased so that the fuel valve will now be opened to a greater extent relatively to the air valve than before. By means of this construction, the relation between the air and fuel valves can be varied so as to control the mixture for different conditions and for various speeds. The fuel valve may be adjusted independently by adjusting the nut 35 which is preferably provided with a knurled head.

The dash pot plunger 28 is preferably provided with apertures so as to form a liquid dash pot. This dash pot device will steady the valves against vibration caused by rapid fluctuations in the pressure, so that the movement of the valves will at all times be steady. By placing the spring 33 below the intake valve it is insured that the valve will at all times be lifted from its seat so as to prevent sticking due to accumulation of grease, etc.

In starting a hydrocarbon engine, it is necessary that the mixture be rich. It is for this purpose that the cam 53 is provided This cam is provided with a slight rise so that when the throttle valve is opened, the cam will engage the arm 54 of the lever 45, so as to open the fuel valve, whereby fuel, and therefore a rich mixture will be admitted to the engine at starting. It is to be understood that this rise is very slight so as not to affect the automatic regulation of the fuel valve by the air intake valve. In order to adjust this cam for different engines and for different conditions, it is adjustable on the lever as shown in Fig. 1. The levers 52 and 50 are preferably connected to links 52ª and 50ª respectively which extend to the steering post of the motor vehicle, so that the operation of the carbureter may at all times be under the control of the chauffeur. By means of this construction both the quality and the quantity of the mixture are under constant control.

The carbureter is simple in construction and cheap to manufacture. The intake valve and its stem can be readily removed by removing the intake plate 20, and the entire operating mechanism for the fuel valve is mounted upon a cover plate 42. The dash pot sleeve and the float can be readily removed by removing the cover plate, and by mounting this sleeve upon and the stem within the tube or sleeve 26, a tight joint can be made between the tube 26 and the float chamber so that all leakage will be prevented. The construction of this tube 26 also permits the cylinder 29 to be readily bored so as to cheapen the manufacture of the device.

It is obvious that various changes may be made in the details of construction without departing from this invention, and it is therefore to be understood that this invention is not to be limited to the specific construction shown and described.

Having thus described the invention, what is claimed is:

1. In a carbureter, the combination with a casing having an air intake and a float

chamber, of an automatically controlled valve for said intake, a fuel valve, a bodily adjustable lever connected to said air valve for controlling said fuel valve, and a support for said lever slidingly mounted on said float chamber.

2. In a carbureter, the combination with a casing having a float chamber, of mixture and fuel valves, a lever connecting said valves whereby they will be controlled in unison, and a support for said lever slidingly mounted on said float chamber.

3. In a carbureter, the combination with a casing having an air inlet and a mixture outlet, of a fuel valve, a lever upon which said valve rests, and a sliding support for said lever adapted to adjust said lever bodily with respect to said fuel valve to vary its effective lever arm.

4. In a carbureter, the combination with a casing having a float chamber, an air inlet and a mixture outlet, of a fuel valve, a lever upon which said valve rests, and a sliding support for said lever mounted on said float chamber and adapted to adjust said lever bodily with respect to said fuel valve to vary its effective lever arm.

5. In a carbureter, the combination with a casing of a fuel valve arranged therein, a lever and a sliding support therefor, and an adjustable sleeve on said valve resting on said lever, whereby said lever may be adjusted with respect to said valve to vary its effective lever arm.

6. In a carbureter, the combination with a casing having an air valve, and a stem for said valve, of a fuel valve, a lever engaging both of said valves, and a sliding support for said lever adapted to slide said lever bodily with respect to both said valves to vary its lever arms with respect thereto.

7. In a carbureter, the combination with a casing having an air valve and a stem for said valve, of a fuel valve, a lever resting on said stem and supporting said fuel valve, and a sliding support for said valve adapted to vary its lever arms with respect thereto.

8. In a carbureter, the combination with a casing having an air intake, of an automatically controlled valve for said intake, a fuel valve, a spring and an adjustable lever bearing on said fuel valve, a spring for operating said lever to move said valve against the tension of the first spring, and means connected to said automatically controlled valve for operating said lever.

9. In a carbureter, the combination with a casing, of a valve therefor, a fuel valve, a lever connecting said valves, and a movable support for shifting said lever bodily with respect to said valves, whereby the effective length of said lever with respect to both valves can be varied.

10. In a carbureter, the combination with a casing, of a valve therefor, a fuel valve, a lever connected to said first valve, a stem for said fuel valve bearing on said lever, and a movable support for shifting said lever bodily, whereby the effective length of said lever can be varied.

11. In a carbureter, the combination with a casing having a float chamber, of air, mixture, and fuel valves therefor, a lever connecting said air and fuel valves whereby they are controlled in unison, and adjustable means for operating said lever from the mixture valve to open the fuel valve without opening the air valve.

12. In a carbureter, the combination with a casing having a float chamber, of air, mixture, and fuel valves therefor, a lever connected to said fuel valve and resting on said air valve, and an adjustable cam on said mixture valve for operating said lever to open the fuel valve without opening said air valve.

13. In a carbureter, the combination with a casing having a float chamber and an air intake, of a valve for said intake, a stem in said float chamber, a float on said stem, a dash pot plunger sliding on said stem and connected to said valve and a cylinder for said plunger located in said float chamber.

14. In a carbureter, the combination with a casing having mixing and fuel supply chambers, and an air intake below said fuel chamber, of a valve for said intake, a stem for said valve, a guide for said stem, a sleeve slidingly fitted on said guide and connected with the stem and a receptacle for said stem and coöperating therewith to provide a dash pot.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERIC G. FOLBERTH.

Witnesses:

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ROBT. W. DAVISON.