

F. L. KINGSTON.
CARBURETER.
APPLICATION FILED MAY 14, 1915.

1,186,797.

Patented June 13, 1916.
2 SHEETS—SHEET 1.

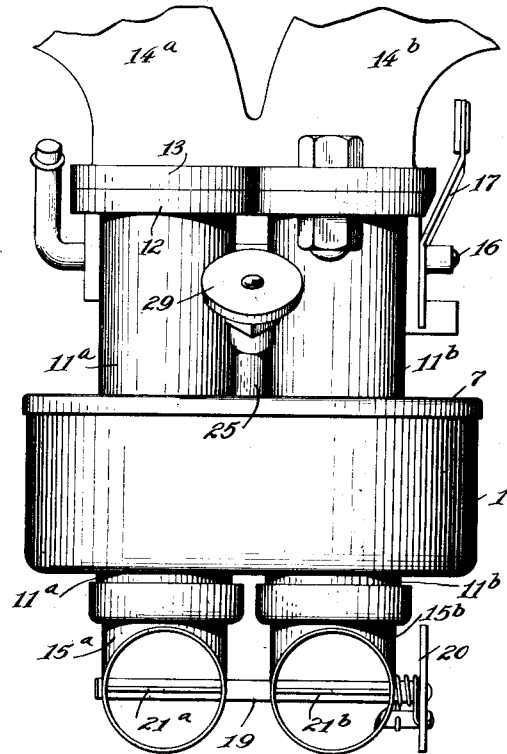


FIG. 1.

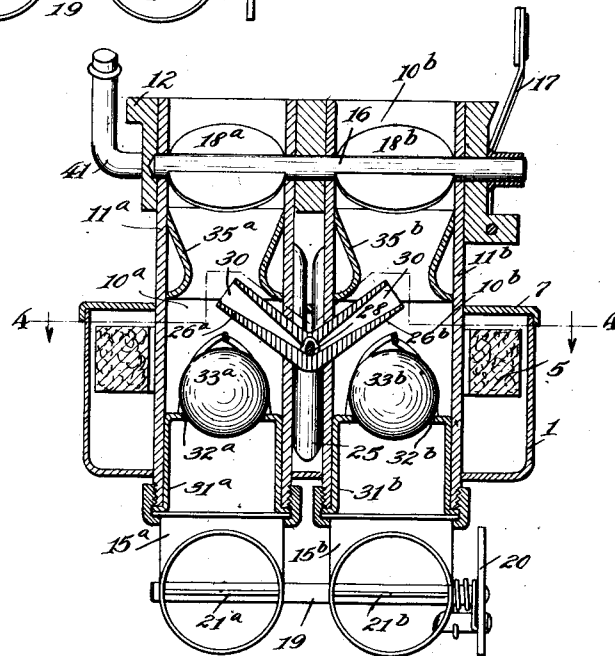


FIG. 2.

WITNESSES:
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H. J. Small

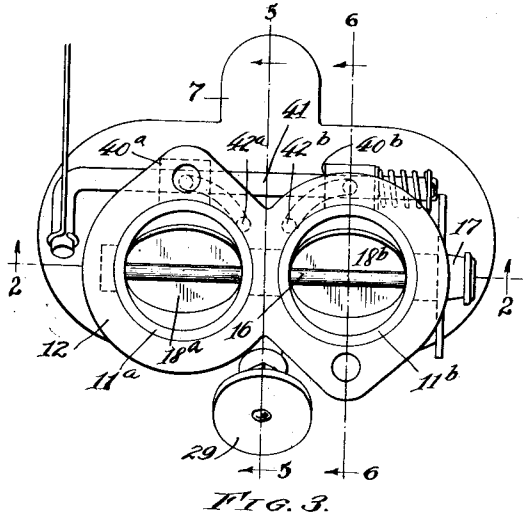
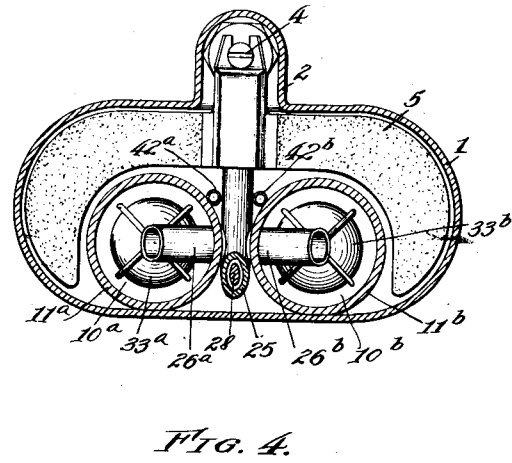
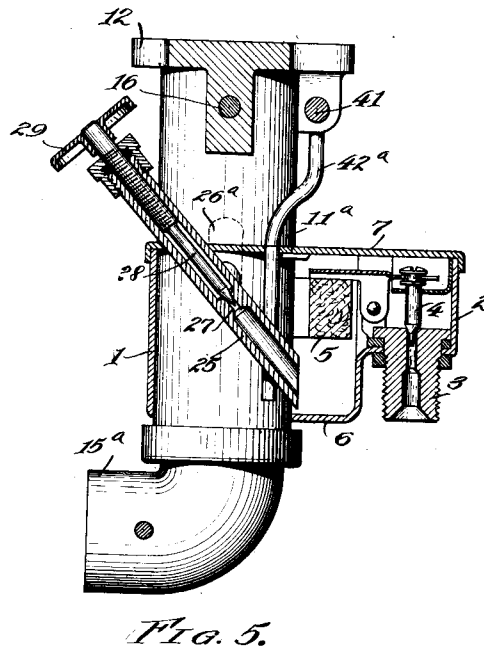
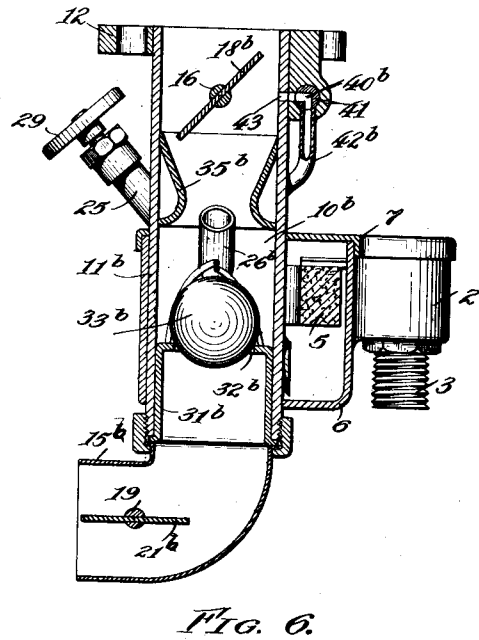
INVENTOR,
BY Frank L. Kingston
Hull Smith

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2 SHEETS—SHEET 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANK L. KINGSTON, OF CLEVELAND, OHIO.

CARBURETER.

1,186,797.

Specification of Letters Patent. Patented June 13, 1916.

Application filed May 14, 1915. Serial No. 28,006.

To all whom it may concern:

Be it known that I, FRANK L. KINGSTON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Carbureters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

10 This invention relates to carbureters, and has for its objects the provision of a carbureter whereby engines of a large number of cylinders can be operated with greater efficiency, steadiness, and power output than 15 by the use of previous carbureting devices, and in which the regulation of the engine operation may be more quickly, accurately, and evenly effected than has heretofore been possible.

20 Another and minor object of the invention is the provision of a device of this nature wherein a multiple cylinder engine can be primed for starting purposes with greater ease and quickness than heretofore; 25 while further objects and advantages will become apparent as the description proceeds.

With the increase in the number of cylinders in combustion engines, it is found 30 that when six or more cylinders of the four-cycle type are connected to the same manifold, there will be an overlapping of the opening of the inlet valves. In addition the arrangement of the crank of a multi-cylinder 35 engine is such that successive impulses are generally derived from widely spaced cylinders, so that the torsional strain from the crank shaft may be made as uniform and regular as possible. The result of these two 40 conditions is that the manifold is always supplying gas to at least two cylinders which are widely spaced apart, wherefore it is found that the gas flow is irregular and uneven and its distribution to the cylinders 45 is uneven, thus conducing to irregular running and inefficient operation. It has heretofore been suggested to employ a plurality of independent carbureters and connect each to a section of the manifold so that the gas 50 flow may be made more even and regular and so that the effect of overlapping may be

avoided. The results of such an arrangement are extremely gratifying in case the carbureters can be adjusted so as to operate evenly, but this is something which is almost impossible to do, owing to the impossibility of having valves of exactly the same constants, fluid levels exactly the same relatively to the valves, openings, of the air chambers exactly the same, equal throttle 60 adjustment, and equality in height of the two carbureters as regards the car itself.

The essence of my invention consists in this, that two or more carbureting chambers, connected independently to different parts 65 of the manifold, are fed from the same reservoir through the intermediation of a single fuel valve provided with branched nozzles, there being one nozzle for each of these carbureting chambers; and the throttle 70 valves are arranged to be moved simultaneously, to the end that a single adjustment shall regulate all the carbureting chambers, and the mixture issuing from all the same 75 shall be identical. Certain features of arrangement and construction are also found of practical importance and will be pointed out in the claims.

In the drawings accompanying and forming a part of my application I have illustrated one embodiment of my said invention, although it will be understood that the same is only one out of a great number of forms that my inventive idea may take.

In these drawings: Figure 1 represents a 85 front elevation of my improved carbureter applied to the branched manifold of an internal combustion engine; Fig. 2 is a vertical sectional view through the carbureter shown in Fig. 1 and corresponding to the 90 line 2-2 of Fig. 3; Fig. 3 is a top plan view of the carbureter shown in Fig. 2; Fig. 4 is a horizontal sectional view taken upon the line 4-4 in Fig. 2 and looking downwardly; and Figs. 5 and 6 are vertical cross sectional 95 views taken upon the lines 5-5 and 6-6 respectively of Fig. 3 and looking in the direction of the arrows.

Describing the parts by reference characters 1 represents the fuel reservoir of my 100 improved carbureter, same being shown as of oval shape and having at its rear side

a hollow protuberance 2 receiving the fuel supply connection 3 with which coöperates the inlet valve 4 controlled by the float 5. The particular construction of the inlet valve and its adjuncts is preferably and substantially like that illustrated and claimed in my copending application Serial No. 772,121 filed June 6, 1913, although any suitable or convenient arrangement could be employed. The bottom of the reservoir is shown at 6, and its top is closed with a cap or cover 7.

In the present embodiment I have illustrated two carbureting chambers 10^a, 10^b, here formed of upright tubular members 11^a, 11^b which traverse the bottom of the receptacle a short distance apart and are formed at their upper ends with a flange 12 adapted for attachment to the flange 13 of the branched manifold 14^a, 14^b, and are provided at their lower ends with the air inlet fittings 15^a, 15^b. The upper ends of these members are traversed by a single rock shaft 16, having attached to one of its ends the operating lever 17, and carrying within the chambers the butterfly valves 18^a and 18^b, respectively. Similarly, the air inlet members are traversed by a single rock shaft 19 having at one end the operating handle 20, and provided inside of the members with the butterfly valves 21^a and 21^b, respectively.

Located in the reservoir between, or at least equidistantly spaced from, the carbureting chambers, is the fuel pipe 25, which is provided with a branch 26^a, 26^b extending to each carbureting chamber. This tube is provided at one point with a constriction 27 adapted to be closed by a needle screw 28 operated by the handle 29, the discharge nozzles communicating with this tube at opposite points and outside of this constriction so that they are controlled equally by manipulation of this needle valve. Each of the discharge nozzles 25^a and 25^b preferably projects into its carbureting chamber at an oblique angle in the manner and for the purpose described and claimed in my copending applications filed May 6, 1912, and March 4, 1914, Serial Nos. 695,425 and 822,266, respectively, and each is likewise provided with a hollowed end 30 forming a fuel cup for the reasons there set forth, although for the purposes of the present invention it will be apparent that any suitable or convenient arrangement may be employed. Also I have shown the bottom of each of the carbureting chambers as provided with a hollow metallic cup 31^a, 31^b, having apertures 32^a, 32^b in their bottoms, receiving the spherical valves 33^a, 33^b, constructed, arranged, and operating substantially as described and claimed in my copending application filed March 4, 1914, Serial No. 822,266. However, so far as the

present invention is concerned, any suitable arrangement of air admission apertures could be employed.

For the purpose of constricting the entering air above the ends of the said nozzles, I have provided each of the carbureting chambers with a reducing shell 35^a, 35^b, arranged between the nozzle and the valve 18^a, 18^b.

For priming the motor I have illustrated each of the carbureting chambers as provided with a rotatable valve 40^a, 40^b, operated by the same rod 41, and communicating by suitable tubes 42^a, 42^b with the lower part of the reservoir. Each of these valves also has a discharge port opening into the chamber at a point adjacent to the throttle valve as shown at 43. When these valves are open the suction produced by the engine, taken in connection with the obstruction afforded by the ball valves 33 and constricting shells 35, will draw a charge of fuel from the reservoir directly into the chamber. During the normal operation of the motor the gas delivered by the two chambers will be exactly identical and can be varied or adjusted exactly equally, and the different cylinders of the motor caused to function in the same manner.

I do not limit myself to the use of this carbureter with engines of the four-cycle type, since there is even more need for such an arrangement in connection with a multi-cylinder, two-cycle engine. Neither do I restrict myself to engines of six or more cylinders since even four cylinder, four-cycle engines at certain speeds have a kind of rhythmic gas vibration set up in the intake manifold which impedes seriously the running of the engines and causes the cylinders to become charged unevenly. This may be entirely overcome by employing the multiple carbureter herein described, though the improvement in operation is not so marked, experience having shown that whereas the substitution of my improved carbureter for a single carbureter will afford substantially an increase of thirty per cent. in the power output of an eight-cylinder engine and twenty per cent. in a six-cylinder engine, the increase in the four-cylinder engine is only from five to ten per cent. depending upon the speed at which it is operated.

I consider that my invention resides primarily in the broad aspects hereinbefore set forth, and only secondarily in the details of construction and arrangement, wherefore I do not restrict myself to the particular construction here disclosed, but only by the terms of the claims and the state of the prior art.

Having thus described my invention, what I claim is:—

1. The combination with an intake mani- 130

fold having a plurality of separate branches, of a carbureting device comprising a plurality of chambers, equal in number to said branches and connected one to each branch, 5 a single fuel reservoir, a single outlet therefrom, and a plurality of discharge nozzles communicating with said outlet, there being one nozzle in each chamber.

2. The combination with an intake manifold having a plurality of separate branches, 10 of a carbureting device comprising a plurality of chambers, equal in number to said branches and connected one to each branch, a single fuel supply pipe, and a plurality of 15 discharge nozzles communicating directly with said pipe there being one nozzle in each chamber.

3. The combination with an intake manifold having a plurality of separate branches, 20 of a carbureting device comprising a plurality of chambers, equal in number to said branches and connected one to each branch, a single fuel reservoir, a single outlet therefrom, and a plurality of identical nozzles 25 symmetrically arranged relatively to said outlet and communicating therewith, there being one nozzle in each chamber.

4. The combination with an intake manifold having a plurality of separate branches, 30 of a carbureting device comprising a plurality of chambers, equal in number to said branches and connected one to each branch, a single fuel supply pipe, and a plurality of identical nozzles symmetrically arranged 35 relatively to said pipe and communicating directly therewith, there being one nozzle in each chamber.

5. The combination with an intake manifold having a plurality of separate branches, 40 of a carbureting device comprising a plurality of chambers, equal in number to said branches and connected one to each branch, a single fuel reservoir, a single outlet therefrom, an adjusting valve for said outlet, 45 and a plurality of identical nozzles symmetrically arranged relatively to said outlet and communicating therewith, there being one nozzle in each chamber.

6. The combination with an intake manifold having a plurality of separate branches, 50 of a carbureting device comprising a plurality of chambers, equal in number to said branches and connected one to each branch, a single fuel supply pipe, an adjusting valve 55 in said pipe, and a plurality of identical nozzles symmetrically arranged relatively to said pipe and communicating directly therewith immediately beside said valve, there being one nozzle in each chamber.

7. The combination with an intake manifold having a plurality of separate branches, 60 of a carbureting device comprising a plurality of chambers, equal in number to said branches and connected one to each branch, 65 a single branched fuel supply nozzle com-

municating with all of said chambers, a throttle in each one of said chambers, means connecting said throttle valves together whereby they may be moved in unison.

8. The combination with an intake manifold having a plurality of separate branches, 70 of a carbureting device comprising a plurality of chambers, equal in number to said branches and connected one to each branch, a single branched fuel supply nozzle communicating with all of said chambers, air 75 inlet fittings communicating with each of said chambers, an air admission valve located in each of said fittings, and means for moving all of said valves in unison. 80

9. Carbureting device comprising a plurality of chambers, a single branched fuel supply nozzle communicating with all of 85 said chambers, a throttle in each one of said chambers, means connecting said throttle valves together whereby they may be moved 85 in unison, air inlet fittings communicating with each of said chambers, an air admission valve located in each of said fittings, and means for moving all of said valves in 90 unison.

10. The combination with an intake manifold having a plurality of separate branches, of a carbureting device having a reservoir 95 and a plurality of upright chambers located adjacent the said reservoir, said chambers being equal in number to said branches and connected one to each branch, a single outlet 100 pipe communicating with said reservoir and extending past said chambers, an adjusting valve in said pipe, and a plurality of discharge nozzles communicating with said 105 pipe outside of the valve seat, there being one nozzle in each chamber.

11. In a carbureting device, a reservoir, a 105 plurality of upright chambers extending through said reservoir, a single outlet pipe communicating with the central part of said reservoir and extending equidistantly past 110 said chambers, and a plurality of discharge nozzles communicating with said pipe at an equal distance from all of said chambers, there being one nozzle in each manner.

12. In a mixture forming and feeding device for a multi-cylinder internal combustion 115 engine, a manifold having two independent branches, a pair of upright chambered members connected one to each branch, a fuel reservoir, an outlet pipe projecting between 120 said chambered members and communicating with said reservoir, and a pair of fuel nozzles communicating with said pipe, one on each side of the same, and each projecting obliquely into one of such chambers.

13. In a carbureting device, in combination, a pair of upright chambered members, 125 a fuel reservoir surrounding the same, an outlet pipe projecting between said chambered members and communicating with the central part of said reservoir, and a pair of 130

fuel nozzles, diverging from opposite sides of said pipe, and each having a hollow open cup at its inner end.

5 14. In a carbureting device, a pair of carbureting chambers, a pair of priming valves carried, one by each of said chambers, each of said valves having a port opening into its chamber, a single operating rod for said priming valves, and pipes leading from said

priming valves into said reservoir adapted 10 to communicate with said ports when said priming valves are open.

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

FRANK L. KINGSTON.

Witnesses:

BRENNAN B. WEST,
HAROLD E. SMITH.