No. 858,437. PATENTED JULY 2, 1907.

A. O. BROOKE.

CARBURETER.

APPLICATION FILED MAR. 10, 1906.

Fig. 2.

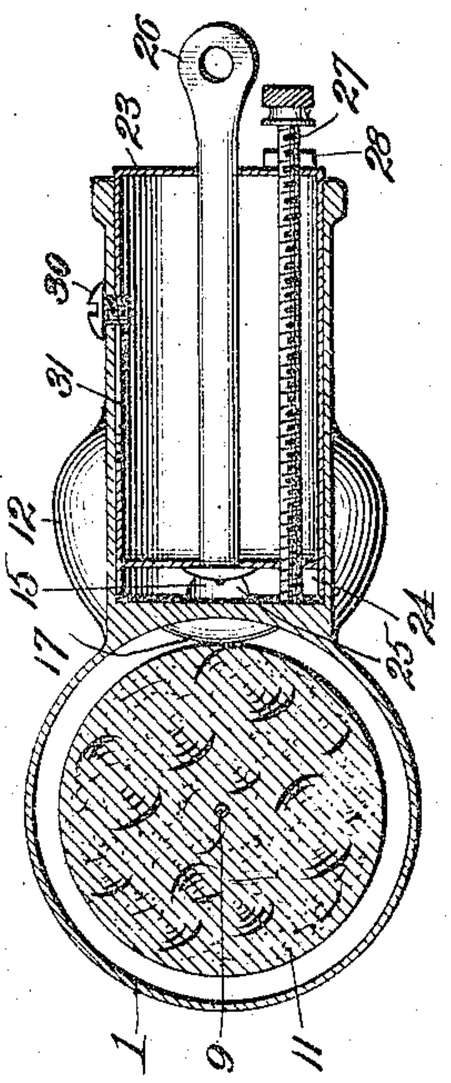


Fig. 3.

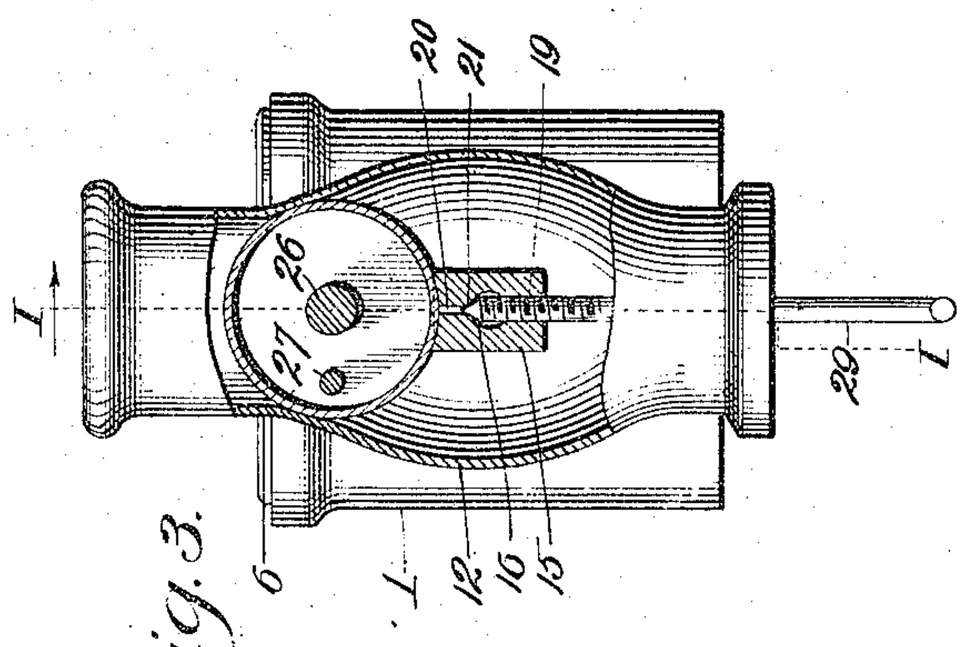
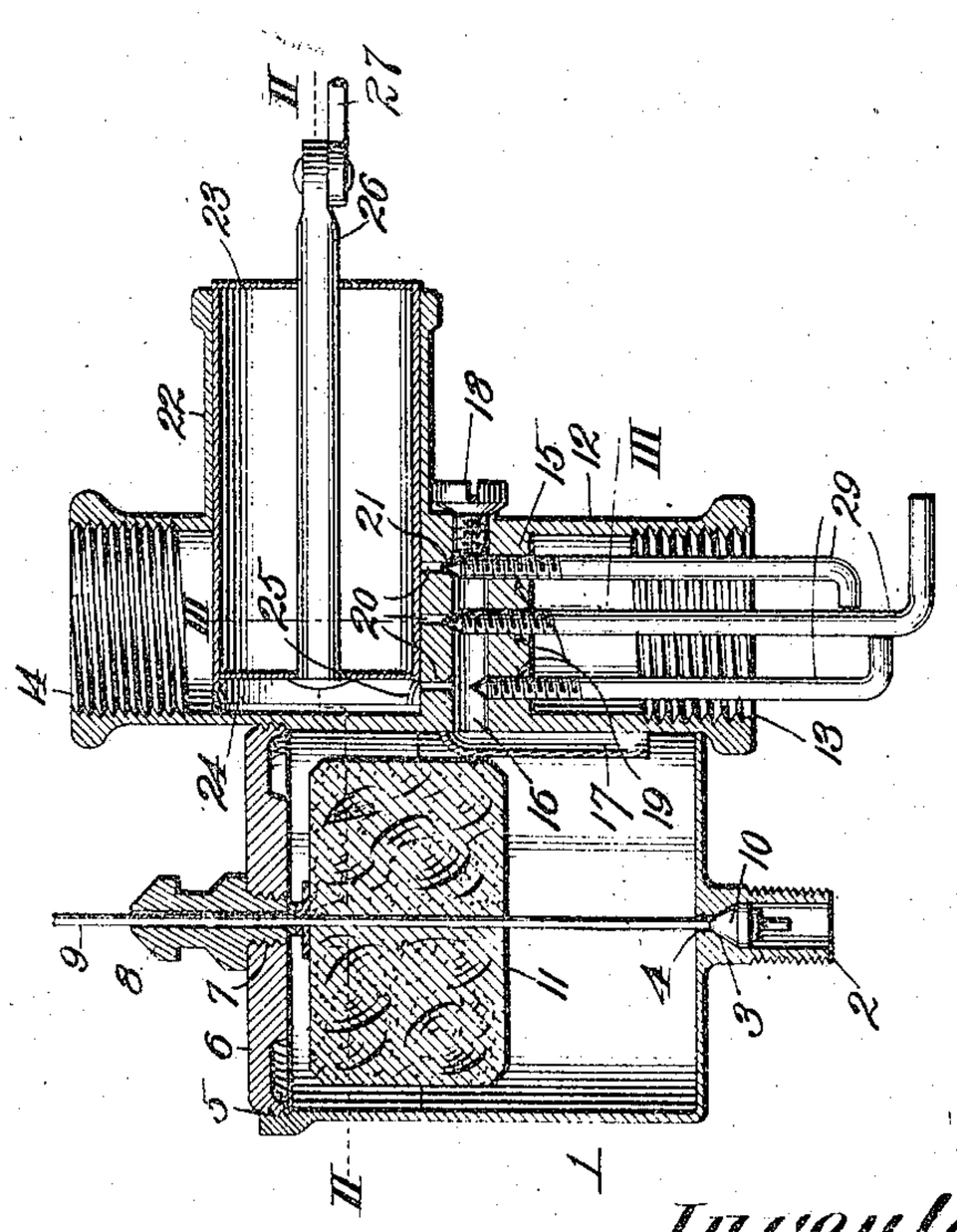


Fig. 1.



Witnesses
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By George H. Thorpe Atty.

UNITED STATES PATENT OFFICE.

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CARBURETER.

No. 858,437. Specification of Letters Patent. Patented July 2, 1907.

Application filed March 10, 1906. Serial No. 305,288.

To all whom it may concern:

Be it known that I, ARTHUR O. BROOKE, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

My invention relates to gasolene carbureters and more especially to that class designed for supplying the charges of explosive mixture to an explosive engine, and my object is to produce a carbureter which operates efficiently and reliably and supplies gasolene and air proportionate to the reciprocatory movement of the throttle valve.

To this end the invention consists in certain novel and peculiar features of construction and organization as hereinafter described and claimed and in order that it may be fully understood reference is to be had to the accompanying drawing, in which—

Figure 1, is a section—taken on the line I—I of Fig. 3,—of a carbureter embodying my invention. Fig. 2, is a section on the line II—II of Fig. 1. Fig. 3, is an elevation with certain parts shown in section on the dotted line III—III of Fig. 1.

In the said drawings, 1 is a float-valve tank provided with a depending tube 2, having a valve seat 3, and a passage 4 communicating with the tank. At its upper end the tank is provided with internal threads 5 engaged by screw cap 6, containing a threaded opening 7, to receive the threaded end of a guide plug 8, through which the float valve stem 9 extends, said stem also extending through passage 4, and having a valve 10 at its lower end adapted to close said passage when the quantity of oil or gasolene in the tank raises the float 11 and rod 9, a predetermined distance.

12 indicates a mixing chamber which is preferably cast integrally with the tank and is bowed outwardly at its opposite sides (see Fig. 3) for a purpose hereinafter named, the lower and upper ends of the mixing chamber being threaded as at 13 and 14 respectively.

15 is a cross bar extending across the mixing chamber from the tank, said cross bar crossing the mixing chamber at its point of greatest cross sectional area, and in practice it is preferred that the mixing chamber shall be so proportioned that its intersection by the cross bar shall leave spaces at opposite sides of the bar which together are substantially equal to the cross sectional area of the mixing chamber at any other point. The cross bar is provided with a longitudinal passage 16, communicating at one end with the passage of the hood 17, which opens at its lower end into and near the bottom of the tank, the opposite end of the passage 16 being closed by a plug 18.

19 indicates three threaded passages extending through the lower half of the bar and into passage 16, and 20 similar passages extending through the upper portion of the bar and communicating also with passage 16, the lower ends of passages 20 being preferably enlarged to form valve seats 21.

22 indicates a tubular arm communicating with and extending laterally from the mixing chamber above bar 15, it being noted in this connection that the upper surface of said bar is concaved so as to form practically a continuation of the lower portion of the arm 22, and reciprocally mounted in said arm is a preferably hollow throttle valve 23 of cylindrical form, the cylindrical body portion projecting by preference beyond the front end of the valve in the form of an annular flange 24, provided above and below its center with recesses 25.

26 indicates a valve stem through which the reciprocatory adjustment of the valve is effected and 27 is a set screw extending longitudinally through the throttle valve and adapted by impingement against the contiguous side of the tank to positively limit the forward movement of the valve, and thus prevent it from ever completely closing the passage 20 nearest the tank. A pull-and-push rod 27^a is connected to the valve stem and by preference is adapted to be operated through the instrumentality of a hand or foot lever, not shown, for the purpose of adjusting the valve. The set screw is prevented from working forward accidentally by the lock nut 28, bearing against the rear end of the valve.

29 indicates needle valves mounted in passages 19, and adapted by engagement with seats 21, to cut off the supply of gasolene through passages 20.

In practice assuming that the engine is operating at low speed, the valve will be uncovering only the front passage 20, that is the passage nearest the tank, and the needle valve controlling said passage will be open, it being understood of course that the remaining valves may also be opened because the throttle valve forms an hermetical seal for the upper ends of the passages controlled by said valves and consequently prevents gasolene from passing up through said passages. The suction apparatus, not shown, which communicates with the upper end of the mixing chamber sucks the gasolene up through the unobstructed passage forward of the valve, the gasolene thus drawn from the tank being immediately replaced because the float drops a proportionate distance and opens valve 10, so as to admit sufficient gasolene through passage 4 into the tank to replace the quantity extracted. The suctional action described draws air up through the mixing chamber at opposite sides of the cross bar forward of the valve, which blasts of air under the obstruction of the cross bar and the bowed form of the mixing chamber, rise in upwardly converging planes so as to pick up and vaporize such gasolene, the intersecting air currents resulting in

effecting a more thorough and complete and intimate mixture of the same with the vaporized gasolene than would occur if the air currents traveled in parallel planes. By thus intimately mixing the air and vaporized gasolene a rich explosive mixture is produced which passes under the action of the suctional apparatus, to the explosive chamber of the engine, not shown. When it is desired to operate the engine at its intermediate speed the valve is adjusted to uncover two of the passages 20, and when it is desired to operate the engine at its highest speed, the valve is adjusted to uncover all three of said passages, speed being diminished at any time by moving the valve sufficiently to cover the outermost or the two outermost passages 20.

The position of the valve not only controls the volume of gasolene which enters the mixing chamber but also the volume of air which passes up through the mixing chamber, that is to say, when the valve exposes a single passage 20, it is so disposed with respect to the tank that less air can pass by to the suctional apparatus than when the valve is arranged to expose two or all of the passages 20.

It has been found in practice that with this carbureter explosive engines operate with a high degree of efficiency and it is believed that this result is largely due to the fact that the air currents are caused to conflict and thus insure a more even and wider distribution of the gasolene vapor through the body of air passing through the upper portion of the mixing chamber.

Attention has been called to the fact that the upper surface of the cross bar is concaved; this cavity forming a comparatively wide and shallow cup for the reception of the gasolene passing up through one or more of the passages 20, such film of gasolene, as it is so shallow as to be but little more than a film, offering a comparatively large area of contact to the air drawn up through the mixing chamber, it being well known that the greater the surface of the body of liquid exposed, the more rapid evaporation takes place. This cup therefore offers a sufficient volume of gasolene for evaporation to insure an explosive mixture of the requisite quality, the variation in the quality being effected of course by the adjustment of valves 29 for the purpose of permitting more or less gasolene to pass up through the passages 20.

From the above description it will be apparent that I have produced a carbureter by which a rich explosive mixture can be produced in charges of the volume required for operating the engine at low, intermediate, or high speed. It is to be understood that while I have illustrated and described my preferred construction, the same is susceptible of modification in minor particulars without departing from the principle of construction involved.

Having thus described the invention what I claim as new and desire to secure by Letters Patent, is:—

1. In a carbureter, an oil-supply means, a mixing chamber, a tubular bar extending across the same and closed at one end and communicating at the other with the oil-supply means and provided with vertically alined passages connecting its bore with the mixing chamber, and valves controlling said passages.

2. In a carbureter, an oil-supply means, a mixing chamber, a tubular bar extending across the same and closed at one end and communicating at the other with the oil-supply means and provided with vertically alined passages connecting its bore with the mixing chamber, valves controlling said passages, and an adjustable valve adapted to close one or more of the outer passages and permit air to pass up through the mixing chamber.

3. In a carbureter, an oil-supply means, a mixing chamber, a tubular bar extending across the same and closed at one end and communicating at the other with the oil-supply means and provided with vertically alined passages connecting its bore with the mixing chamber and having its upper surface concaved, valves controlling said passages, and a cylindrical throttle valve partitioning the mixing chamber above said bar and fitting snugly on the concaved surface of the latter, and provided with recesses in the upper and lower portions of its front end.

4. In a carbureter, an oil-supply means, a mixing chamber, a tubular bar extending across the same and closed at one end and communicating at the other with the oil-supply means and provided with vertically alined passages connecting its bore with the mixing chamber and having its upper surface dished, valve controlling said passages, a cylindrical throttle valve partitioning the mixing chamber above said bar and fitting snugly on the concaved surface of the latter, and provided with recesses in the upper and lower portions of its front end, and means to limit the forward movement of said valve.

5. In a carbureter, an oil-supply means, a mixing chamber, a tubular bar extending across the same and closed at one end and communicating at the other with the oil-supply means and provided with vertically alined passages connecting its bore with the mixing chamber and having its upper surface concaved, valves controlling said passages, a cylindrical throttle valve partitioning the mixing chamber above said bar and fitting snugly on the concaved surface of the latter and provided with recesses in the upper and lower portions of its front end, and a set screw carried by the valve and adapted to limit the forward movement of the same.

6. A carbureter, comprising a fuel tank, a mixing chamber having a tubular cross bar closed at one end and communicating with the tank at the other, and provided with valve-controlled passages connecting its bore with the mixing chamber, a valve controlling the supply of gasolene to the tank, a float in said tank to seat and unseat said valve, and a throttle valve partitioning the mixing chamber above said bar and fitting snugly on the concaved surface of the latter, and provided with recesses in the upper and lower portions of its front end.

7. In a carbureter, an oil-supply means, a mixing chamber having opposite walls converging upwardly, and a cross bar between said walls at the points of greatest divergence and provided with a bore communicating with the oil-supply means and with passages extending upward from said bore and communicating at their upper ends with the mixing chamber, and valves controlling said passages,

8. In a carbureter, the combination of a gasolene tank, a mixing chamber, a tubular cross bar in the mixing chamber, communicating with the tank and having its upper side dished, and provided with a plurality of passages connecting its bore with said dished surface, and means for preventing the level of the contents of the tank from rising above the plane of said dished face of the cross bar.

9. In a carbureter, an oil-supply means, a mixing chamber to admit air at one end and discharge an explosive mixture at the other, a tubular bar within said chamber, communicating with the oil-supply means and provided with oil-discharging passages communicating with the chamber, valves controlling said passages, and an adjustable throttle valve for always exposing one or more of the passages and preventing the escape of oil through the passage or passages covered and for partitioning more or less of the mixing chamber accordingly as it closes a greater or less number of said passages.

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

ARTHUR O. BROOKE.

Witnesses:
H. C. RODGERS,
G. Y. THORPE.