J. R. MACK.

CARBURETER.

APPLICATION FILED MAY 13, 1909.

963,914.

Patented July 12, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

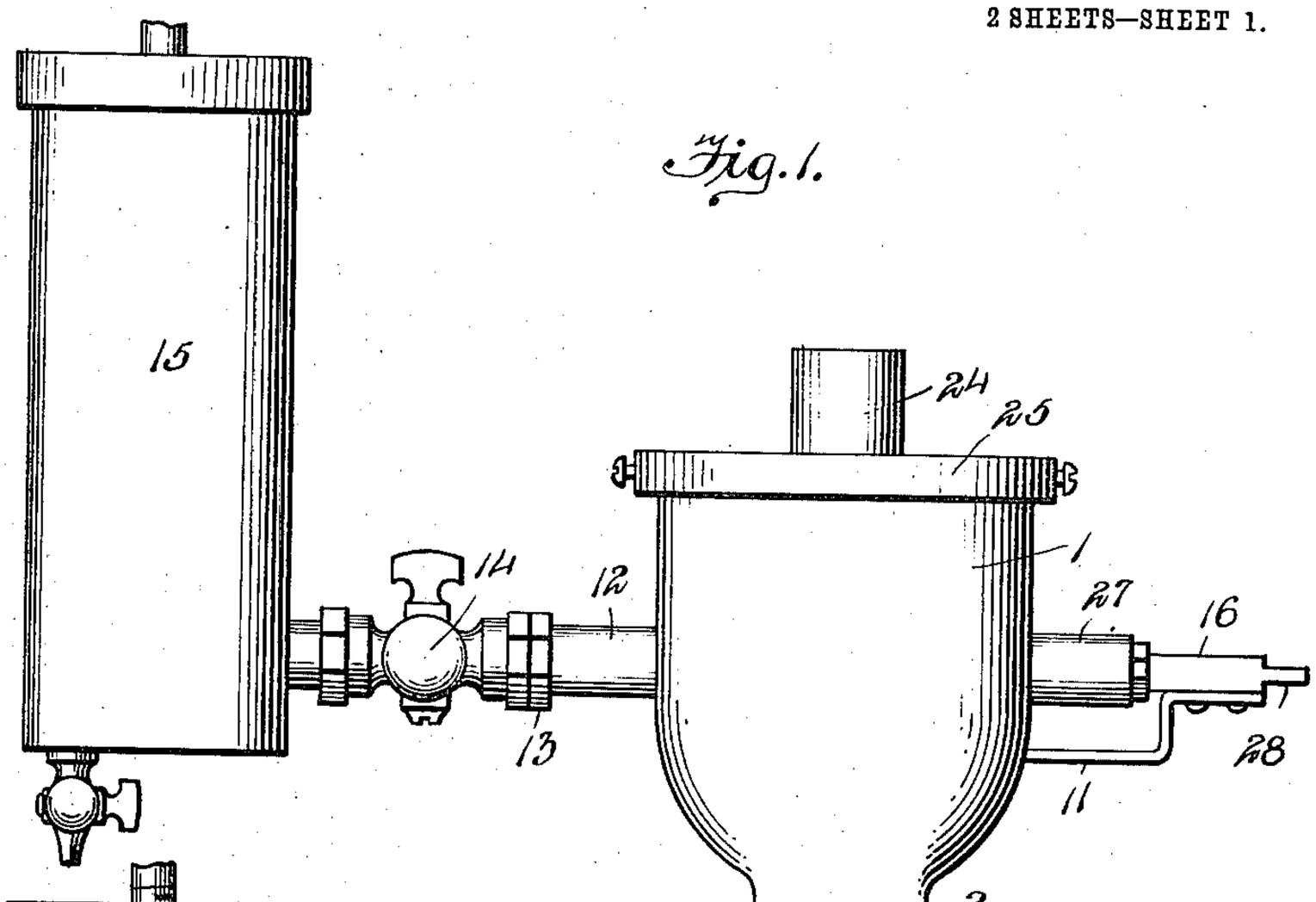

Fig. 2.

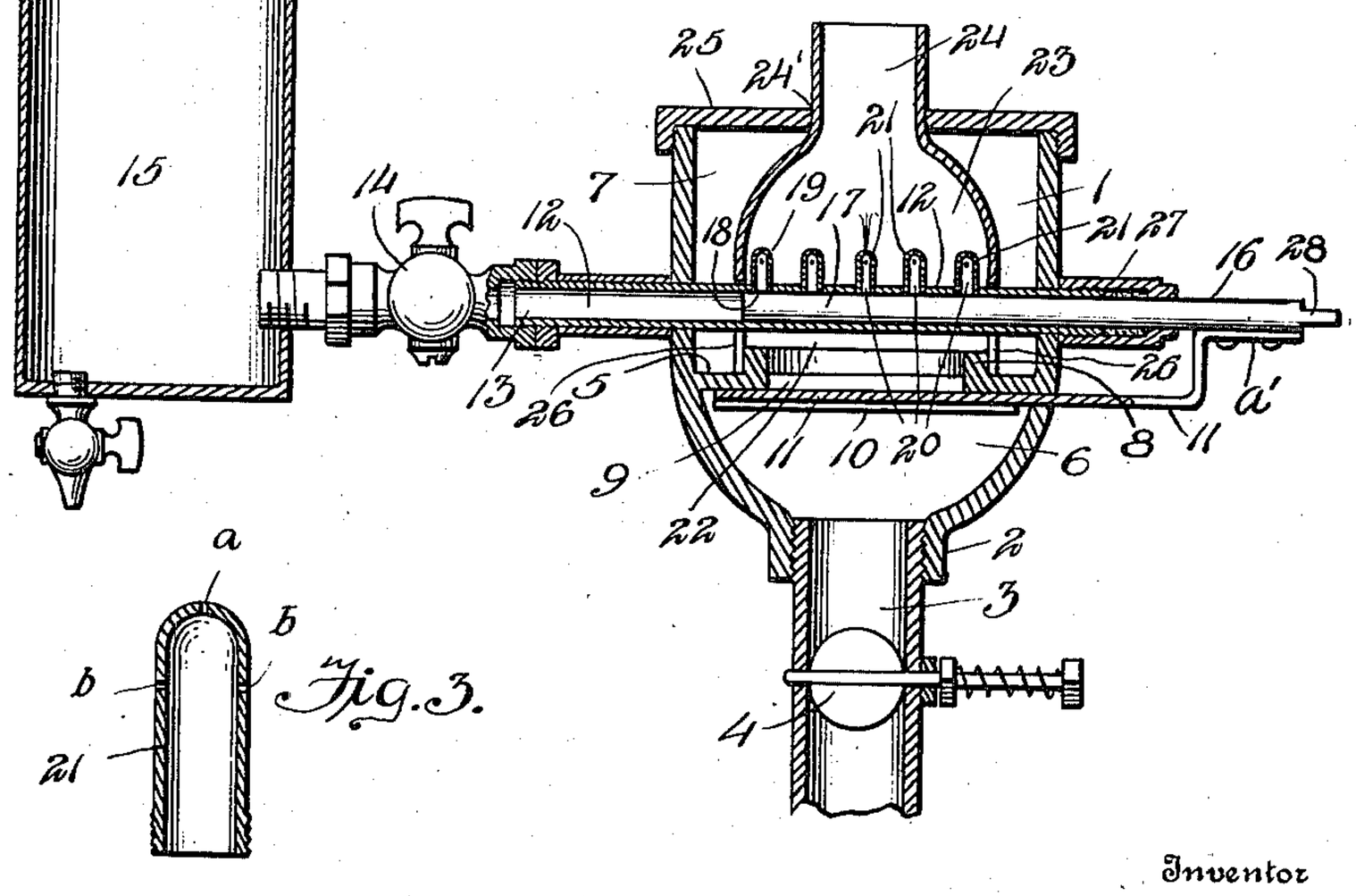

Fig. 3.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

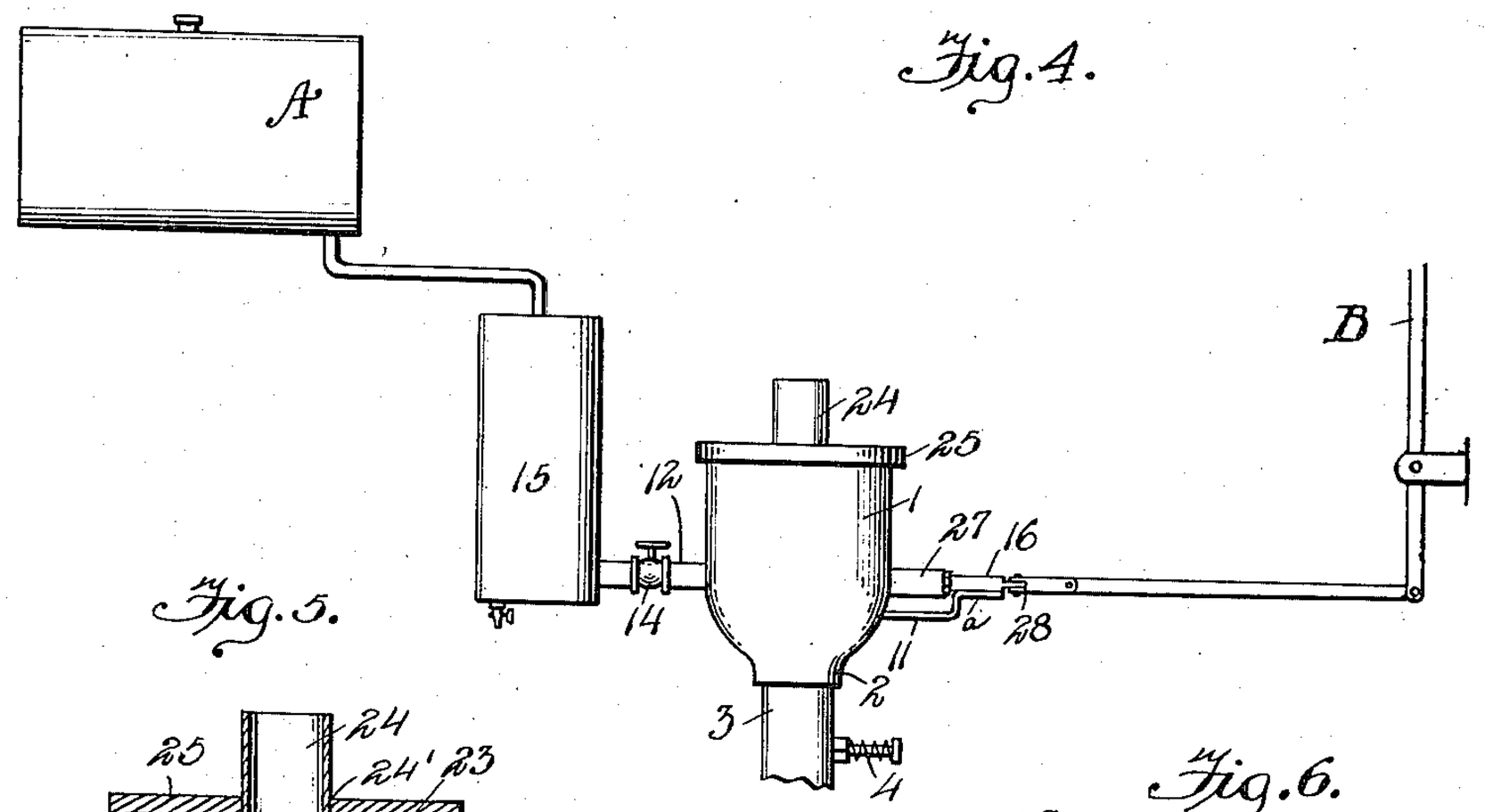


Fig. 5.

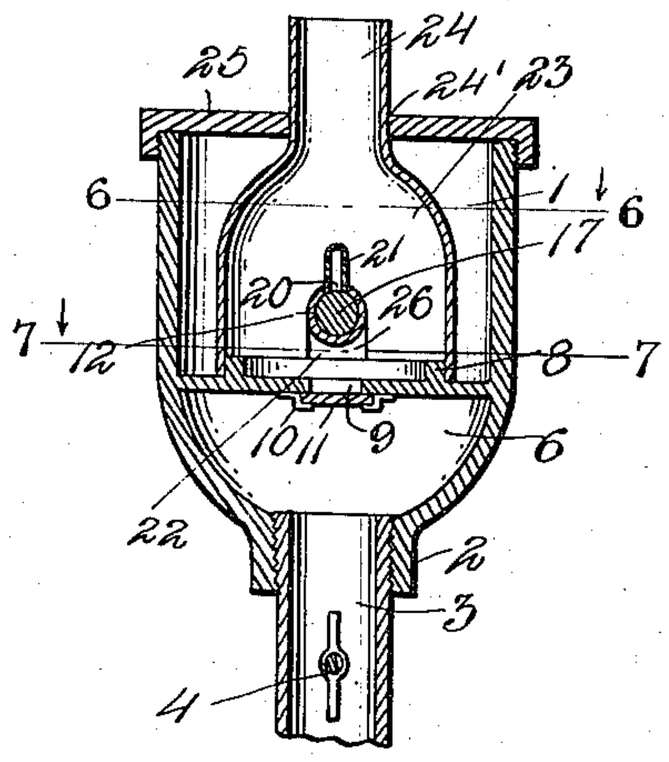


Fig. 6.

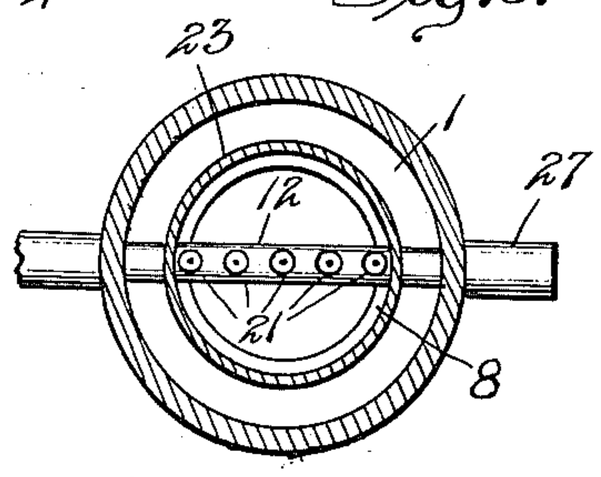
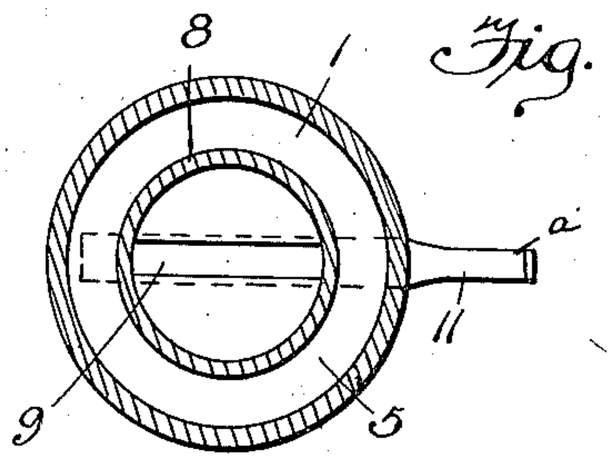


Fig. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

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CARBURETER.

963,914. Specification of Letters Patent. Patented July 12, 1910.

Application filed May 13, 1909. Serial No. 495,732.

To all whom it may concern:

Be it known that I, JOHN R. MACK, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Carbureters, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in carbureters, that is a carbureter, especially designed for use to furnish a carbureted air to explosive engines, this particular form, being particularly constructed for using heavy oils, although lighter oils, can be used.

My carbureter, consists primarily of a casing divided into a lower invertedly tapered chamber and an upper chamber, the lower chamber being provided with a centrally arranged air inlet while the upper chamber is provided with a carbureted air outlet, which is vertically above the air inlet and is connected to the manifold of the engine. The communication between these chambers is controlled by a flat sliding valve, which regulates the admission of air into and through the large upper chamber, in which directly above and parallel with, of slightly greater width than the air admission slot, is the oil feed pipe, in which is slidingly mounted a piston or cylindrical valve, which is operated simultaneously with the flat sliding valve, both being connected together exteriorly of the casing. The piston valve is slightly shorter than the flat valve, so that the first of a series of nozzles mounted upon the upper side of the oil feed pipe, is opened to allow the priming oil to be sprayed or atomized in three directions, namely upward and centrally of the nozzle and to opposite sides of the feed pipe; and after the engine has been started, the valves are moved so as to open the air admission slot and as many of the nozzles, as may be desired. The air in being drawn upwardly passes upon both sides of the feed pipe, and as the oil is sprayed or atomized under pressure, the heavier the oil the greater the pressure, and in the direction above stated, the air is thoroughly carbureted, within a removably tapered dome or casing, whose upper tapered end conducts the broken streams of carbureted air toward each other, causing a greater commingling of the same before the carbureted air passes to the engine. I have found by experiments and tests, that this form of carbureter, will produce a carbureted air from any class of oil, heavy, medium or light, and that when the valves are properly adjusted that there will be complete combustion of the carbureted air, demonstrating beyond a doubt, that the full efficiency of carbureted air and the engine is being obtained.

To clearly illustrate my invention, attention is invited to the accompanying drawings, in which—

Figure 1 is a side elevation of the complete carbureter in operative position. Fig. 2 is a vertical central sectional view of the same, and Fig. 3 is a detail section of one of the nozzle tips removed and enlarged. Fig. 4 is a side elevation of the carbureter, oil reservoir, pressure relieving tank and air and oil valve operating means. Fig. 5 is a vertical central sectional view of the carbureter taken on a diametrically opposite line from the section shown in Fig. 2. Fig. 6 is a cross section taken on line 6—6, Fig. 5, looking downwardly. Fig. 7 is a cross section taken on line 7—7, Fig. 5, looking downwardly.

Referring to the drawings: the numeral I designates the outer casing, which is provided with the air inlet 2, in which is mounted the air inlet pipe 3, carrying the damper valve 4. The outer casing is divided by the partition or horizontal plate 5, into the small lower invertedly tapered chamber or compartment 6 and the large compartment or chamber 7. Mounted upon the upper face of the partition 5, and concentrically with the walls of the compartment 7, is a ring or rim 8, and provided centrally of this partition, and extending diametrically thereof, is the narrow substantially rectangular opening or slot 9, whereby communication is had between the lower and upper compartments, and whereby air is admitted into the upper compartment.

Upon the under side of the partition and paralleling the slot 9, are the two guide strips 10, in which is slidably mounted the flat air controlling valve 11, which is adapted to close the entire slot, when desired, or when starting the engine.

Mounted in the walls of the outer casing and extending across the upper compartment above the partition and above and par-

allel with the slot or opening 9, is the oil feed pipe 12, whose inlet end 13, is connected to the cock valve casing 14, which in turn is connected with the oil condensing or pressure relieving chamber 15, which in turn is fed with oil under pressure from the proper reservoir A, Fig. 4. It will thus be seen that the oil is delivered to the feed pipe 12, and when the parts are in the position as shown in the drawings, no oil is allowed to flow out of the pipe.

The cylindrical rod 16 has formed integral therewith the piston or cylindrical valve 17, which is slidably mounted in the feed pipe 12, so that the valve 11, whose outer end a', is connected to the underside of the rod 16, will be operated simultaneously with the valve 17. The outer end of the rod 16 is reduced, for the operative connection of the lever B, Fig. 4, thus enabling the two valves to be operated as desired.

To allow oil to be atomized to produce the desired carbureted air, the lever B, is pulled upon, simultaneously pulling the rod 16 and the piston or cylindrical valve 17 and also the flat valve 11, but as the flat valve is purposely made longer than the piston valve, the piston valve passes beyond the opening 18, of the first or priming nozzle tip or jet 19, and allowing oil to enter said nozzle and be atomized or sprayed through its central opening a and its two oppositely disposed openings b, the flat valve at this position of the piston valve not having been moved far enough to open the end of the slot 9 and admit air. These openings a and b, where heavy oil is used are larger than when light oil is used, as will be apparent. As the engine is started, the valves are moved outwardly, and as many of the remaining openings 20 and nozzles 21, are brought into play, the slot 9, is opened and air admitted proportionately.

By positioning the slot, as I do directly below the oil feed pipe, and constructing the valves so that the slot is opened only directly below the desired nozzle or nozzles that are brought in to use, it is evident that the current of air will strike the under side of the oil feed and be split, so that it will pass upwardly upon both sides of feed pipe, and as the nozzles deliver three sprays of oil, two directly into the sprays of air and one directly upwardly, it will be seen that the desired carbureted air is produced.

Removably fitting with the upper compartment and having its lower edge 22, fitting around the rim 8, is the tapered mixing dome or casing 23, whose outlet 24 passes through the central opening 24', of the removable top 25, of the outer casing. This mixing casing is provided with oppositely arranged slots 26, which allow the casing to fit over the oil feed pipe, and thereby confine the nozzles within the same, while at the same time air is admitted only with the same. By fitting the mixing casing so as to cover the air inlet or slot 9 and the oil feed pipe and its atomizers, and providing the casing with the tapering opening 24, the tapered walls leading to said opening, receive the split streams of air, after the stream has been split by contact with the oil feed pipe, and bring said split streams toward each other and together, just prior to the emitting of the carbureted air through the opening 24 into the conducting pipe of the engine. By this means, I provide a thorough means of commingling the air and oil, and insure a thorough commingled carbureted air, prior to its entering the explosive chamber of the engine.

To prevent any leakage of oil around the piston valve, I provide the stuffing-box 27, and also to prevent the pressure of oil from opening the valves, any controlling means B may be attached to the reduced end 28 of the valve.

What I claim as new, is—

1. In a carbureter, the combination with a casing having a centrally and transversely arranged air inlet slot and an air outlet vertically above and alined therewith, a series of atomizers mounted in the casing and arranged transversely above and parallel with the air inlet slot, a valve for controlling the atomizers in succession, a valve for regulating the air inlet slot proportionate to the number of atomizers in use, and means for operating the valves.

2. In a carbureter, the combination with a casing provided with vertically alined air inlet and outlet, and provided with a partition intermediate of said inlet and outlet, said partition being apertured centrally and transversely, a series of atomizers mounted above the partition and arranged transversely thereof above and parallel with the apertured portion of the partition and also in line with the inlet and outlet of the casing, a valve for controlling said atomizers in succession, a valve for regulating the apertured portion of the partition proportionate to the number of atomizers in use, and means for operating said valves.

3. In a carbureter, the combination with a casing provided with vertically alined air inlet and outlet and divided by a partition into an upper and a lower compartment, said partition being provided with a transverse slot centrally thereof, a series of atomizers mounted in the upper compartment and arranged transversely thereof above and parallel with said slot, a sliding valve for controlling said atomizers in succession, a sliding valve for regulating the opening of the slot proportionate to the number of atomizers in use, and means for operating said valves simultaneously.

4. In a carbureter, the combination with a

casing provided with vertically alined air inlet and outlet and divided by a partition into an upper and a lower compartment, said partition being provided with a transverse slot centrally thereof, an oil feed mounted transversely of and in the upper compartment and above and parallel with the slot, a series of atomizers carried by said oil feed, a valve mounted in the oil feed to control said atomizers one at a time in succession, a valve for also regulating the opening of the slot proportionate to the number of atomizers in use, and means for operating the valves simultaneously.

5. In a carbureter, the combination with a casing provided with vertically alined air inlet and outlet and divided by a partition into an upper and a lower compartment, said partition being provided with a transverse slot centrally thereof, a series of atomizers mounted in the upper compartment and arranged transversely thereof above and parallel with said slot, a valve for controlling said atomizers in succession, a valve for regulating the opening of the slot proportionate to the number of atomizers in use, and means for operating said valves simultaneously.

6. In a carbureter, the combination with a casing having an air inlet and a carbureted air outlet vertically in line with each other, a partition dividing the casing into an upper and a lower compartment and provided with a slot transversely therethrough, an air control valve mounted in said slot, an oil feed also mounted transversely within the casing and directly above and parallel with the slot of the partition, a valve for said oil feed, and means whereby the air and oil valves are operated simultaneously.

7. In a carbureter, the combination with a casing having an air inlet and a carbureted air outlet vertically in line with each other, a partition dividing the casing into an upper and a lower compartment and provided with an air admission slot transversely thereof, an oil feed pipe mounted centrally and transversely of the casing and above and parallel with the slot, the slot and oil feed pipe being interposed between the inlet and outlet of the casing, a valve mounted in the pipe for controlling the feed of oil, a valve for controlling the feed of air through the slot and proportionate to the amount of oil fed, and means for operating said valves simultaneously.

8. In a carbureter, the combination with a casing having an air inlet and a carbureted air outlet vertically in line with each other, said casing having a partition dividing it into an upper and a lower compartment, said partition being provided with a slot centrally and transversely thereof whereby communication is had between the lower and upper compartments and air is admitted into the upper compartment, a valve to control said slot, an oil feed pipe mounted in the upper compartment and directly above and parallel with said air inlet slot, a series of atomizers carried by the oil feed pipe, a valve mounted in the pipe for controlling the atomizers in succession, and means for operating said valves simultaneously.

9. In a carbureter, the combination with a casing having an air inlet in its lower end and a carbureted air outlet vertically above in its upper end, a partition dividing the casing into an upper and a lower compartment, said partition being provided with a central transverse air inlet slot, an oil feed pipe mounted directly above and parallel with said slot and of greater width than the slot, whereby the stream of air passing through the slot to the outlet of the casing is split by the pipe, a series of atomizers carried by the oil feed pipe, a sliding valve mounted in the oil feed pipe to control the atomizers one at a time in succession, a sliding valve controlling the transverse slot of the partition, said air control valve being of greater length than the oil feed valve, whereby the first one of the atomizers is opened before the air valve permits air to be admitted to the upper compartment, and means for controlling the oil feed and air feed valves simultaneously.

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

JOHN R. MACK.

Witnesses:
D. P. MOORE,
G. M. SPRING.