F. D. MALTBY.

CARBURETER.

APPLICATION FILED OCT. 10, 1917.

1,379,772.

Patented May 31, 1921.

2 SHEETS—SHEET 1.

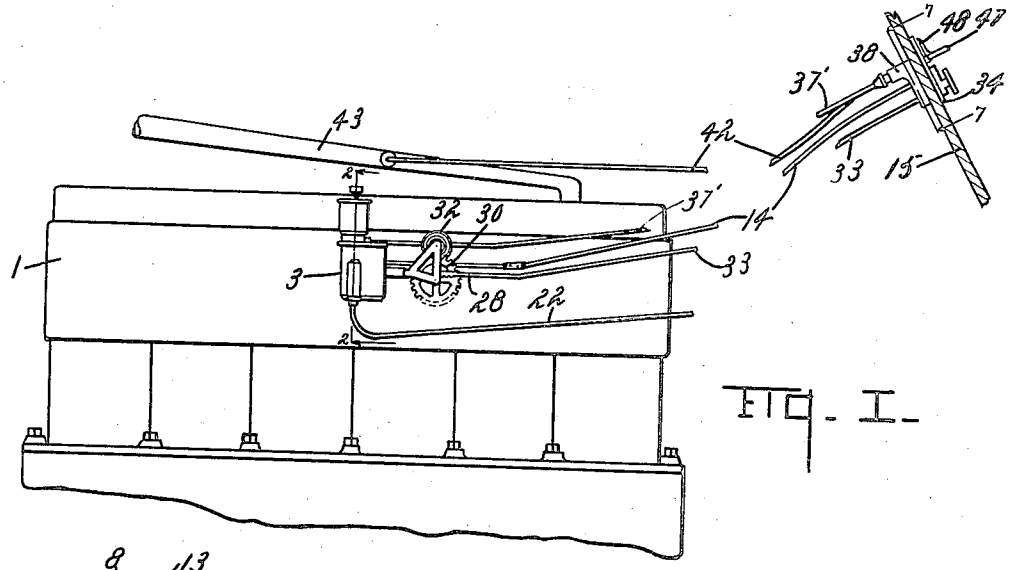


FIG. I.

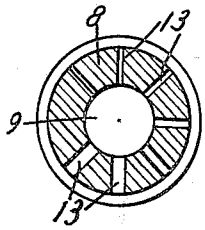


FIG. VIII.

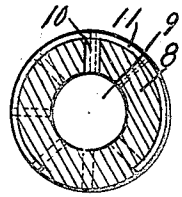


FIG. IX.

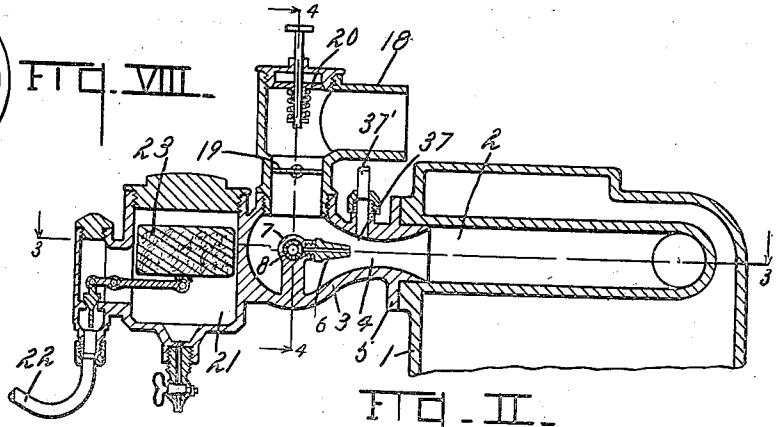


FIG. II.

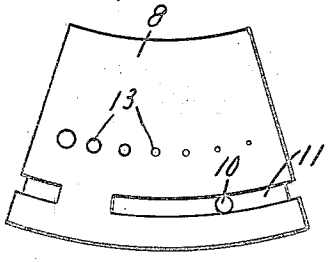


FIG. X.

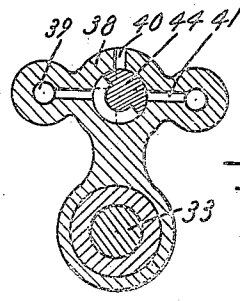


FIG. VII.

WITNESSES:

Harold Barnes

Luther Blake

INVENTOR.

FRANK D MALTBY

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ATTORNEYS.

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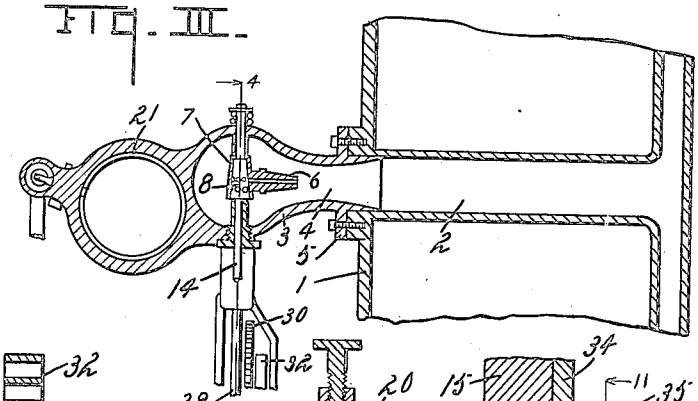
CARBURETER.

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2 SHEETS—SHEET 2.

FIG. III.



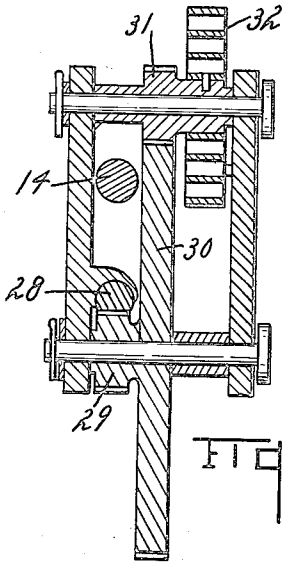


FIG. VI.

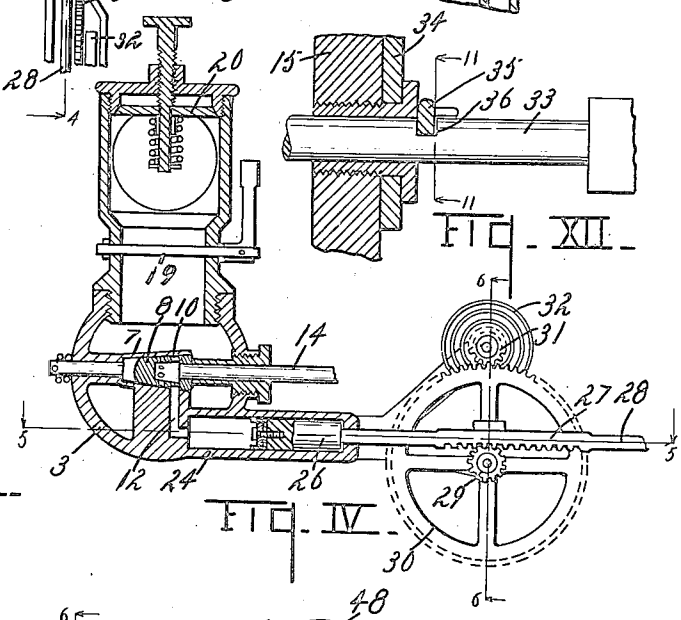


FIG. XII.

FIG. IV.

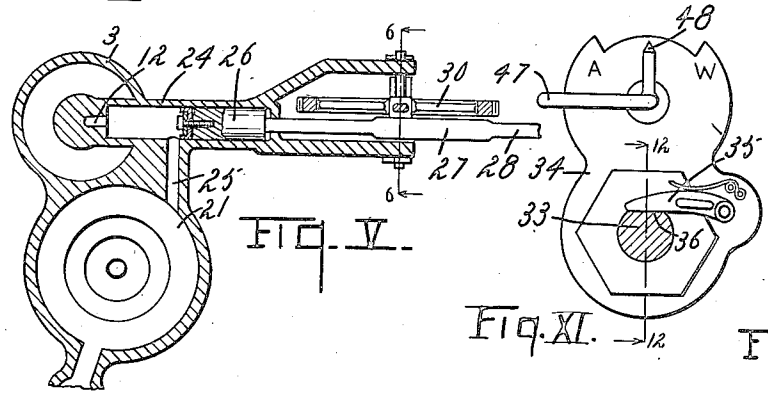


FIG. V.

FIG. XI.

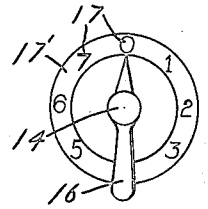


FIG. XIII.

WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANK D. MALTBY, OF BATTLE CREEK, MICHIGAN.

CARBURETER.

1,379,772. Specification of Letters Patent. Patented May 31, 1921.

Application filed October 10, 1917. Serial No. 195,714.

To all whom it may concern:

Be it known that I, FRANK D. MALTBY, a citizen of the United States, residing at Battle Creek, Michigan, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improvements in carbureters.

The main objects of this invention are:

First: to provide an improved combined carbureter and priming device.

Second, to provide an improved carbureter in which the feed of determined amounts of fuel may be readily secured.

Third, to provide in a carbureter an improved priming device.

Further objects, and objects relating to details and economies of construction and operation will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the devices and means described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure constituting a preferred embodiment of my invention is illustrated in the accompanying drawing forming a part of this specification, in which:

Figure I is a detail side elevation of an engine equipped with my improved carbureter and priming device.

Fig. II is a detail vertical section on a line corresponding to line 2—2 of Fig. I.

Fig. III is a detail horizontal section on a line corresponding to line 3—3 of Fig. II.

Fig. IV is a detail vertical section on a line corresponding to line 4—4 of Figs. II and III.

Fig. V is a detail horizontal section on a line corresponding to line 5—5 of Fig. IV.

Fig. VI is a sectional view on a line corresponding to line 6—6 of Figs. IV and V showing details of the pump driving means.

Fig. VII is a detail section on a line corresponding to line 7—7 of Fig. I showing details of the air and water control.

Fig. VIII is a detail section to the discharge or delivery ports of the fuel feed valve.

Fig. IX is a transverse section through the inlet port of the fuel feed valve.

Fig. X is a diagrammatic view showing the ports of the fuel valve.

Fig. XI is a detail section on a line corresponding to line 11—11 of Fig. XII, showing the arrangement of the valve and priming pump control members and the index and indicia members associated therewith.

Fig. XII is a detail longitudinal section on a line corresponding to line 12—12 of Fig. XI.

Fig. XIII is a detail front elevation of the control valve finger piece and its index.

In the drawings, similar reference characters refer to similar parts throughout the several views, and the sectional views are taken looking in the direction of the little arrows at the ends of the section lines.

Referring to the drawings, 1 represents a six cylinder engine having the manifold or inlet passage 2 formed therein. The manifold is formed in the engine body as is the case with certain types of engines now constructed. These parts are mainly shown conventionally.

My improved carbureter comprises a body member 3 having a venturi passage 4 delivering directly to the manifold, as shown in Fig. II. The body member is provided with an attaching flange 5. Within the carbureter is a horizontally disposed nozzle 6 delivering centrally of the venturi. The feed valve casing 7 is, in the structure illustrated, formed integrally with the body member 3 and is disposed transversely to the nozzle. The feed regulating valve 8 is in the structure illustrated of the rotary tapered or plug type and is provided with a chamber 9 and an inlet port 10, connecting with the chamber and with a peripheral inlet groove 11. This groove, when the valve is open, registers with an inlet passage 12, see Fig. IV.

The valve is provided with a plurality of discharge ports 13 of varying size or graduated in size, the ports being arranged in the same plane so that they may be successively brought into register with the nozzle, thus controlling the fuel feed of the nozzle. The arrangement of the ports is diagrammatically illustrated in Fig. X.

The stem 14 of the valve is preferably extended through the dash or instrument board 15, shown conventionally in Fig. I, and provided with a finger piece 16, an index 17 and an indicia member 17′ having numerals or other indicia thereon, as shown in Fig. XI, so that the operator is able to determine the position of the valve. This arrangement

enables the adjustment of the feed valve to secure the desired opening. Valves having threaded adjustment have been heretofore provided for regulating the fuel feed, but in such valves, the operator does not know the extent to which the valve is opened. By providing the fuel feed valve with a series of ports, the operator knows by reference to the index and indicia what the valve opening is.

The carbureter is provided with an air intake 18 which may be connected to a suitable heater if desired. The throttle 19 is disposed in front of the nozzle 6. A spring controlled auxiliary air inlet 20 is preferably provided.

The carbureter is provided with a fuel reservoir 21 connected to a suitable source of supply by pipe 22 and controlled by a float valve designated generally by the numeral 23. The float valve is arranged so that the oil level is approximately that of the nozzle.

The passage 12 is connected with the fuel reservoir through the pump cylinder 24 which is provided with a side inlet port 25, the inner end of the cylinder being connected with the feed valve through the passage 12. When the plunger 26 is retracted, this inlet port 25 of the cylinder is opened so that the reservoir is normally connected with the feed valve through the cylinder. When the plunger is actuated, the port 25 is cut off and the fuel within the cylinder forced out through the feed valve which may be adjusted to control the fuel delivered by the pump.

In the structure illustrated, I provide means for actuating the pump comprising the rack 27 on the plunger rod 28 and a train of gears, consisting of the gears 29, 30, and 31, driven by the coiled spring 32. By this actuating means, the plunger is driven at an approximately uniform speed so that the priming charge is delivered at an approximately uniform rate. The plunger rod 28 has a suitable extension or actuating rod 33, which reciprocates through the instrument board plate 34. The latch 35 coacts with the notch 36 in the actuating rod 33 to hold the plunger in its retracted position, as shown in Figs. IV, XI, XII. When the plunger is retracted, the spring is wound and is retained under tension by means of the latch 35. When it is desired to actuate the primer, the latch is disengaged and the plunger is actuated to deliver the priming charge.

I preferably provide, in this connection, a means for delivering an auxiliary supply of air to the venturi at 37 or for delivering water at this point. The water acts as a decarbonizer agent and generally adds to the efficiency of the engine.

To control the delivery of air or water, a pipe 37′ is connected to the valve casing 38 which has a passage 39 with which the pipe communicates. The valve casing has an air inlet port 40 and a water inlet passage or port 41 which is connected by the pipe 42 to the water circulation pipe 43. It is to be understood that this pipe 42 may be connected to any suitable source of water supply. The valve 44 may be adjusted to cut off both air and water or so as to admit either air or water. The stem of the valve 44 is provided with a finger piece 47 disposed through the instrument board plate 34 and provided with an index 48, the plate being provided with a suitable indicia, indicating the air and water position of the valve. In operation, to start the engine the plunger 26 is released. This cuts off the passage 25 and the fuel is forced out through the feed valve which may be adjusted to control the delivery of the fuel by means of the several ports of different sizes in the valve. This provides a force feed for the fuel until the engine has time to warm up enough to operate properly under the normal suction feed.

I have illustrated and described my improvements in but one embodiment as I believe the disclosures herein will enable the embodiment or adaptation of my improvements as may be desired. I desire also to mention that in the accompanying drawing I have not attempted to maintain the relative proportions of parts and that various parts are shown mainly in conventional form as the structural details thereof may be varied as required to meet existing conditions and the particular adaptations.

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

1. In a carbureter, the combination of a fuel reservoir, a nozzle, a fuel feed valve having a plurality of delivery ports of varying size, a pump cylinder having a side connection with said fuel reservoir and an end connection with said fuel valve, a plunger adapted when in its retracted position to uncover said reservoir connection, and an actuating means for said plunger whereby said plunger is gradually actuated to deliver the priming charge at an approximately uniform rate during the delivery stroke of the plunger.

2. In a carbureter, the combination of a fuel reservoir, a nozzle, a fuel feed valve having a plurality of delivery ports of varying size, a pump cylinder having a side connection with said fuel reservoir and an end connection with said fuel valve, a plunger adapted when in its retracted position to uncover said reservoir connection.

3. In a carbureter, the combination of a fuel reservoir, a nozzle, a fuel feed valve having a plurality of delivery ports of va-

rying size, an indicia member associated therewith for indicating the said delivery ports, a pump cylinder having a side connection with said fuel reservoir and an end connection with said fuel valve, a plunger adapted when in its retracted position to uncover said reservoir connection.

4. In a carbureter, the combination of a nozzle, a fuel feed valve having a plurality of delivery ports of varying size, a pump cylinder connected with said fuel valve, a plunger, and an actuating means for said plunger whereby said plunger is gradually actuated to deliver the priming charge at an approximately uniform rate during the delivery stroke of the plunger.

5. In a carbureter, the combination of a fuel reservoir, a nozzle connected thereto, said connection comprising a pump cylinder having a side connection with said fuel reservoir and an end connection with said nozzle, a plunger adapted when in its retracted position to uncover said reservoir connection, an actuating means for said plunger comprising a driving spring and a train of gears whereby said plunger is gradually actuated to deliver the priming charge at a practically uniform rate during the delivery stroke of the plunger, and a means for holding said plunger in its retracted position.

6. In a carbureter, the combination of a nozzle, a pump cylinder connected to said nozzle, a plunger, an actuating means for said plunger, comprising a driving spring and a train of gears whereby said plunger is gradually actuated to deliver the priming charge at a practically uniform rate during the delivery stroke of the plunger, and a means for holding said plunger in its retracted position.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

FRANK D. MALTBY. [L. S.]

Witnesses:
M. E. IRISH,
I. W. SOHRAM.