

No. 722,357.

PATENTED MAR. 10, 1903.

H. A. DAVIS.  
CARBURETER FOR GAS ENGINES.  
APPLICATION FILED MAR. 1, 1902.

NO MODEL.

FIG. 1.

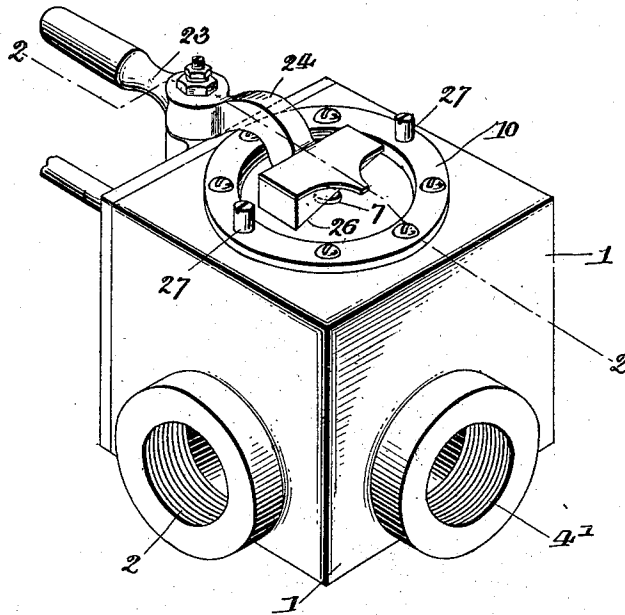
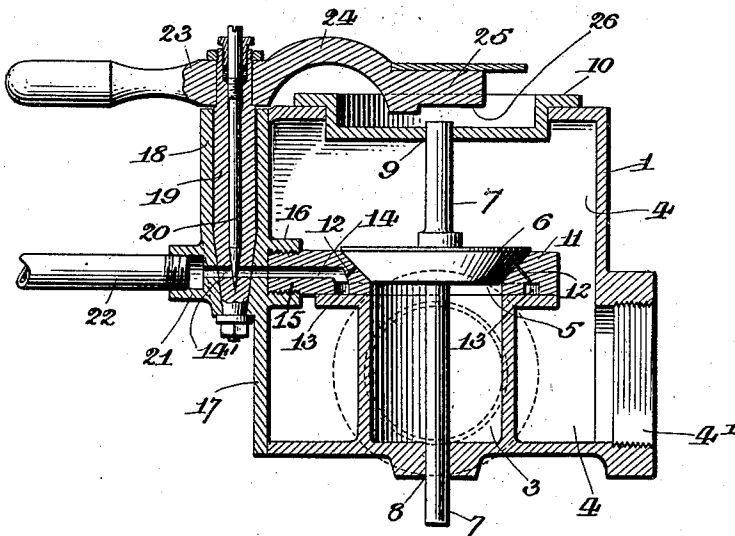


FIG. 2.



WITNESSES:  
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atly.

# UNITED STATES PATENT OFFICE.

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## CARBURETER FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 722,357, dated March 10, 1903.

Application filed March 1, 1902. Serial No. 96,224. (No model.)

*To all whom it may concern:*

Be it known that I, HERBERT A. DAVIS, a citizen of the United States, residing in the city of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Carbureters for Gas-Engines, of which the following is a specification.

This invention is a carbureter designed, primarily, for effecting by simple and efficient mechanism a ready variation of the proportion of oil to air combined for the production of an explosive gas, as well as for regulating the rate at which the oil and air shall be combined while maintaining the predetermined ratio of combination.

The nature and characteristic features of the improvements will fully appear by reference to the following description, taken in connection with the accompanying drawings, of which—

Figure 1 is a perspective view of a carbureter embodying the invention, and Fig. 2 is a vertical sectional view taken on the line 2 2 of Fig. 1.

As shown in the drawings, a casing 1 is provided with the inlet 2, through which air is admitted to the chamber 3. The air-chamber 3 communicates with the mixing-chamber 4 through the port 5, which is controlled by the lift-valve 6, this valve being fixed on a stem 7, which reciprocates in bearings 8 in the bottom and 9 in the cap 10 of the casing.

The seat 11 for the valve 6 is provided with a plurality of ducts 12 and a circular channel 13, communicating therewith, to which the oil-conduit 14 leads, the valve-seat being preferably made, for convenience of construction, as a separate part from the wall of the air-chamber 3, to which it is connected. A stem 15 on the valve-seat engages with the socket 16 of the detachable casing-plate 17. The plate 17 carries a valve-casing 18, which retains the rotary valve 19 for controlling the passage 14. A needle-valve 20, carried by and longitudinally adjustable within the valve 19, is adapted to be set so as to regulate the orifice 14' of the valve 19, thus regulating the maximum flow through the passage 14. A socket 21 on the casing 18 receives the end of the oil-supply pipe 22.

The handle or lever 23 for operating the valve 19 has an arm 24 with a stop 25 thereon, which is adapted to move across the path of the valve-stem 7, the stop having an inclined face 26, whose relation to the valve-stem regulates the height to which the valve 6 shall rise, and consequently the extent to which its port 5 shall be opened. The stop 25, limited in movement by the pins 27, is adapted to be further moved, after the valve 19 has closed the conduit 14, out of the path of the stem 7, so that the valve 6 may be opened freely and permit the passage of air while the oil is cut off.

It will now be evident that the maximum flow of oil through the conduit 14 may be varied by adjusting the needle-valve 20, which varies the size of the orifice 14', so that the proportion of oil may be varied with reference to the proportion of air with which it is to be combined. With the orifice 14' adjusted to the size desired it may be opened to the extent desired by turning the handle 23, which operation moves the valve 19 and the stop 25 simultaneously. The position of the stop 25, determined by the position of the valve 19, determines the rise of the stem 7 and the extent to which the valve 6 shall open the port 5. The rise of the valve 6 simultaneously opens the port 5 and the ducts 12, by which air entering by the inlet 2 and flowing through the chamber 3 and port 5 picks up oil flowing through the conduit 14, channel 13, and ducts 12 upon the face of the valve-seat at various points around its circumference. The air combining with the oil, which it vaporizes, they pass into the mixing-chamber 4, where further admixture is effected, from which the explosive gas formed by the admixture is carried through the outlet 4' to the engine. When the valve 6 drops back upon its seat at the end of each impulse, it cuts off simultaneously both the air and the oil, which again flow simultaneously upon the opening of this valve at the next impulse.

The foregoing improvements provide means for preventing the flow and accumulation of oil in the carbureter between suction strokes while the air is cut off, as well as the common waste and danger due to the escape of oil so accumulating, thus preventing the incoming

- air from being supercharged with oil, by reason of which the charge may fail to explode and the engine stop. A single simple operation reduces the flow of both oil and air in the same proportion and to the extent desired in slowing down the engine, which operation admits of wholly cutting off the oil, while permitting the air to flow in, stopping the engine. The advantages resulting from these simple means for controlling the oil and air, by which the engine is brought under entire control, while waste and danger are avoided, will be readily understood by those skilled in the art.
- 15 It will be understood that this mechanism is not limited to the use of oil and air, but may be employed with any constituents which it is desired to combine according to the principle of operation described.
- 20 Having described my invention, I claim—
1. In a carbureter, a rotary valve, a fuel-conduit controlled thereby, a lift-valve, an air-conduit controlled by said lift-valve, a stop connected with said rotary valve for limiting the opening of said lift-valve in proportion to the opening of said rotary valve, said lift-valve being adapted for closing said fuel-conduit, substantially as specified.
  2. In a carbureter, a rotary valve, a fuel-conduit controlled thereby, a lift-valve mounted on a reciprocating stem, an air-conduit controlled by said lift-valve, and stop mechanism connected with said rotary valve and movable across the path of said reciprocating stem and limiting the opening of said lift-valve in relation to the opening of said rotary valve, said lift-valve being adapted for closing said fuel-conduit, substantially as specified.
  3. In a carbureter, a compound valve, a fuel-conduit controlled thereby, a second valve, an air-conduit controlled thereby, said second valve simultaneously closing both said conduits, and mechanism connected with said compound valve for limiting the opening of said second valve to correspond with the opening of said compound valve, substantially as specified.
  4. In a carbureter, a rotary valve, a needle-valve for varying the orifice of said rotary valve, a reciprocating valve, an air-conduit controlled by said reciprocating valve, and mechanism connected with said rotary valve for limiting the opening of said reciprocating valve with relation to the opening of said rotary valve, substantially as specified.
  5. In a carbureter, a valve which controls the flow of oil and air, a second valve which controls the flow of oil, and mechanism connected with said second valve for limiting the opening of said first valve with relation to the opening of said second valve, substantially as specified.
  6. In a carbureter, an air-port, a plurality of ducts for delivering oil around said port, a channel communicating with said ducts, a conduit leading to said channel, a valve for controlling said conduit, a valve for controlling said port and the ducts leading thereto, and mechanism coacting with said second valve whereby the opening thereof regulates the opening of said first valve, substantially as specified.
  7. In a carbureter, an air-port, a plurality of ducts for delivering oil thereto, a conduit leading to said ducts, a valve for controlling said conduit, a valve for controlling said port and ducts, and mechanism connecting said valves by which the opening of said first valve limits the opening of said second valve, substantially as specified.
  8. In a carbureter, an air-chamber, a valve-seat connected therewith, a channel extending around said valve-seat, a plurality of ducts leading from said channel to the face of said valve-seat, a valve for simultaneously closing the ports of said passage and ducts, mechanism for limiting the opening of said valve, and simultaneously-acting mechanism for limiting the flow of oil to said ports, substantially as specified.
  9. In a carbureter, an air-inlet, an oil-inlet, valves for controlling said inlets, means carried by one of said valves for limiting the movement of the other of said valves relatively to said first valve, said means being constructed so that the complete closure of said first valve permits the free opening of said second valve, substantially as specified.
- In testimony whereof I have signed my name to this specification in the presence of the subscribing witnesses.
- HERBERT A. DAVIS.
- Witnesses:  
A. FLORENCE YERGER,  
PERCIVAL H. GRANGER.