G. I. BATTELLE.

CARBURETER.

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1,283,043.

Patented Oct. 29, 1918.

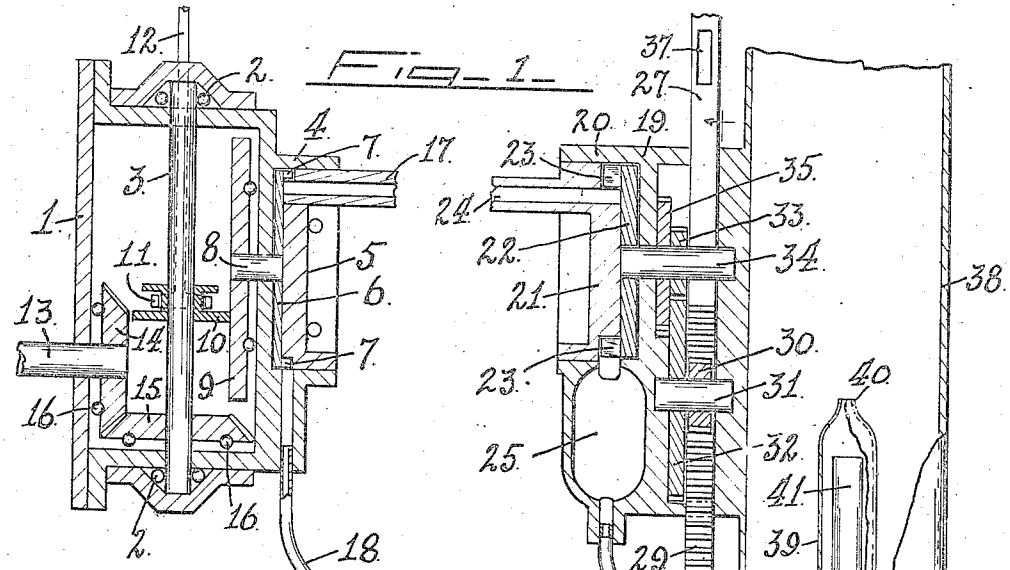


FIG. 1.

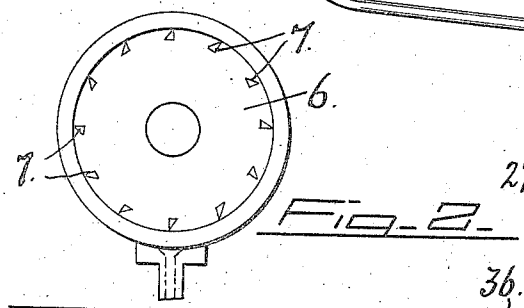


FIG. 2.

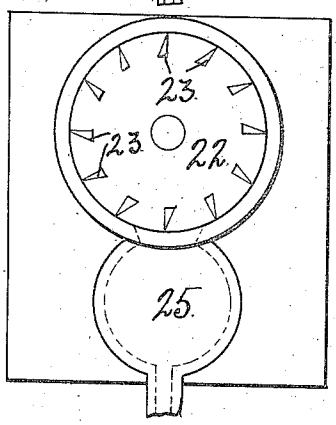


FIG. 3.

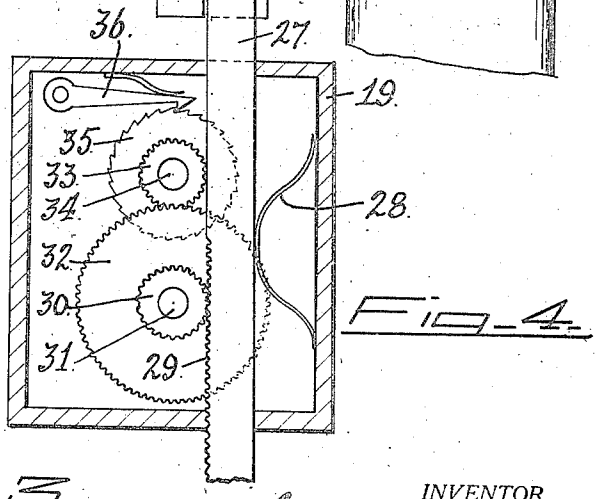


FIG. 4.

WITNESS.

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CARBURETER.

1,283,043. Specification of Letters Patent. Patented Oct. 29, 1918.

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To all whom it may concern:

Be it known that I, GEORGE I. BATTELLE, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

My invention relates to carbureters. The object I have in view is to supply an exact ratio of fuel to ingoing air, which ratio when once set is constant for all speeds, but which may be varied at will to suit any combination of speed, temperature or barometric conditions.

To this end my invention consists in the novel carbureter which I shall now fully describe by reference to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of both the cam shaft driven feed and the throttle-controlled feed, showing their connection with the heating unit and the intake manifold.

Fig. 2 is a face view of the cam-shaft driven feed disk.

Fig. 3 is a face view of the throttle controlled feed disk and the underlying reservoir.

Fig. 4 is a face view of the train of gears which by means of the throttle stem operates the feed disk of the throttle-controlled feed.

1 is the shell of the cam-shaft driven feed, in which on ball bearings at 2, rotates a shaft 3. Within a housing on the exterior of the shell, formed by a flange 4 and an associated cover 5, is mounted for rotation the feed disk 6 which consists of a plate, provided with an annular series of measuring vanes 7, spaced to predetermined distance, and of predetermined area.

The feed disk 6 is carried by a shaft 8 upon the inner end of which, within the shell 1, is a friction gear 9.

Slidably mounted on the shaft 3 is a friction gear 10, engaging the friction gear 9, and adapted to be adjusted radially relatively thereto, for increase and decrease of speed transmitted, by means of a fork 11, on the end of a rod 12 which is to extend to the dash and to be associated with a dial, not shown.

The shaft 3 is driven from the engine cam shaft 13, through bevel gears 14 and 15, mounted within the shell 1 on ball bearings 16, as indicated.

17 is the fuel inlet pipe which passes through the housing cover 5 and communicates with the feed disk 6.

18 is the outlet pipe from the disk 6. 19 is the shell of the throttle-controlled feed. In a housing 20 of this shell, behind a cover 21 is mounted the feed disk 22 having spaced and suitably proportioned measuring vanes 23. With the feed disk 22 communicates the fuel inlet pipe 24, and said disk communicates with a reservoir 25 from which an outlet pipe 26 issues.

27 is the throttle stem, slidable in the shell 19 and held to place by a spring 28, Fig. 4. The throttle stem has a rack 29 which engages a pinion 30, on a short shaft 31 which also carries a gear 32. This gear meshes with a pinion 33 on a short shaft 34, which shaft carries the feed disk 22. Said shaft 34 also carries a ratchet 35, with which a spring controlled pawl 36 engages, Fig. 4. In the throttle stem is a slip-joint 37.

38 is the intake conduit. In this is located a heating or vaporizing unit comprising a shell 39 with nozzle 40, and an inclosed, spaced, electric heating member 41, with connection 42 to the battery, not shown. Into the shell 39 of the heating or vaporizing unit lead the outlet pipes 18 and 26 from the cam-shaft driven feed and the throttle controlled feed, respectively. At 43 is indicated the rack and quadrant connection by which the throttle stem controls the air regulating valve.

It will now be seen from the foregoing that the stream of fuel oil is separated into two portions and both measured by the vanes of the feed disks. One portion is measured by the cam shaft driven feed disk 6 to supply the constant demands of any presecured speed, and the other portion is measured out by the feed disk 22 actuated through the train of gears operated by the rack 29 on the throttle stem 27 as the increment needed over and above the constant supply, to raise an existing speed to a desired speed. The two streams are then united and forced by the cam-shaft driven feed disk, through the heating unit 39 in the intake conduit 38. This unit vaporizes the fuel before introducing it into the stream of inrushing air.

In order to vary the ratio of fuel to air, the friction drive 9, 10 is introduced between the cam shaft 13 and the feed disk 6 driven by it, which varies the ratio of diameters of driving and driven gears and hence varies the ratio of fuel to air.

By means of the cam-shaft-driven feed any presecured engine speed has constantly measured out for its need the amount of fuel which has been predetermined as correct to enrich the volume of air displaced by the pistons. The portion of the fuel supplied to accelerate any existing speed to a desired speed is measured by the properly positioned vanes 23 of the feed disk 22 which is operated by the throttle stem 27 which stem opens the inlet air valve for the increased speed. The feed disk 22 and the air inlet valve will, therefore, move in unison when the latter is being opened, but when it is being closed, a counter revolution of the feed disk 22 is prevented by the action of the pawl 36 and ratchet 35 and the slip joint 37 in the throttle stem. In this closing movement the throttle stem, yielding against the spring 28 as permitted by the slip joint 37, slips its rack 29 over the teeth of the pinion 30, the latter being held by the pawl 36.

I claim:—

1. A carbureter comprising a measuring force feed device communicating with a fuel supply pipe and with an intake conduit; means for driving said force feed device from the engine cam-shaft; a second measuring force feed device communicating with the fuel supply pipe and with the fuel stream from the first feed device, entering the intake conduit; a throttle stem for controlling the admission of air to the intake; and means for operating said second feed device from said throttle stem, simultaneously with the operation of the air control.

2. A carbureter comprising a measuring feed device communicating with a fuel supply pipe and with an intake conduit, means for driving said device; means for varying the speed of said device; a second measuring feed device communicating with the fuel supply pipe with the fuel stream from the first feed device and entering the intake conduit; a throttle stem for controlling the admission of air to the intake; and means for operating said second feed device from the throttle stem, simultaneously with the operation of the air control, consisting of a rack on the stem, a pressure spring for the stem, a train of gears, a retaining pawl and ratchet, and a slip joint in the stem.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEORGE I. BATTELLE.

Witnesses:
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