Feb. 27, 1934. F. D. BIDDLE 1,948,840

GOVERNOR DEVICE FOR ENGINES

Filed Aug. 22, 1931

FIG. 1

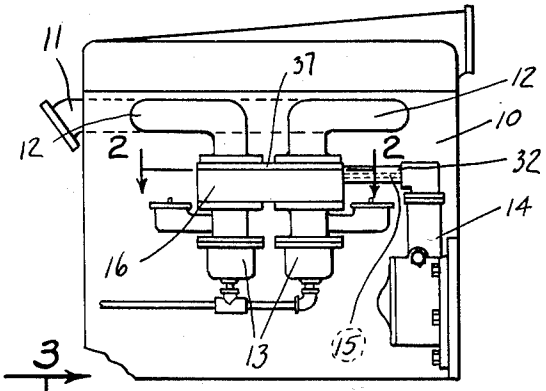


FIG. 2

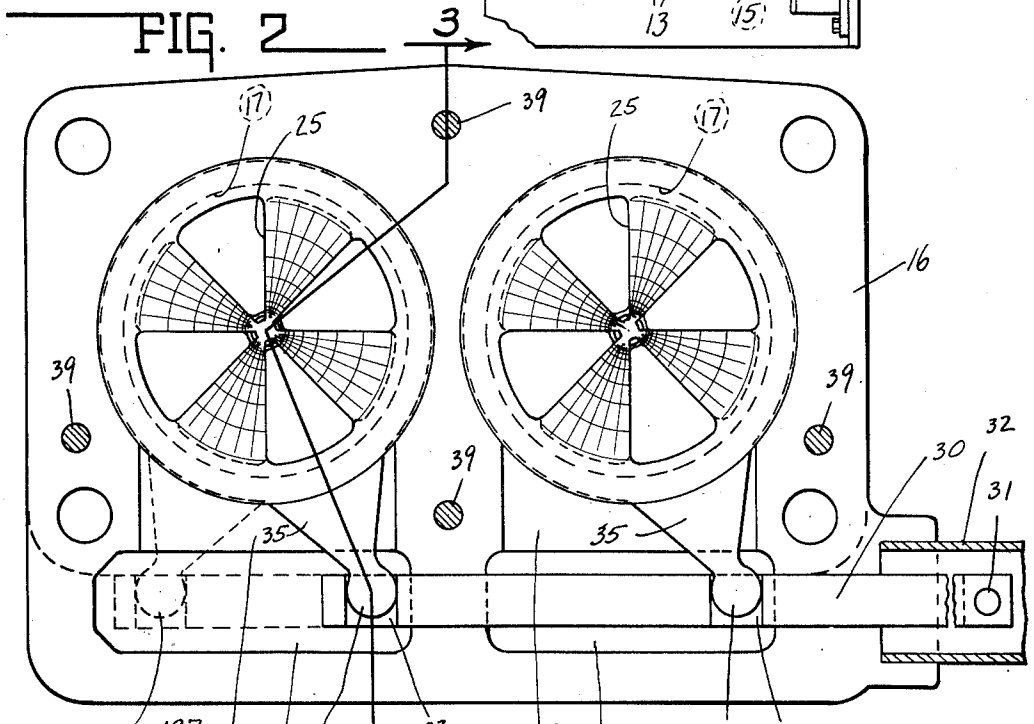
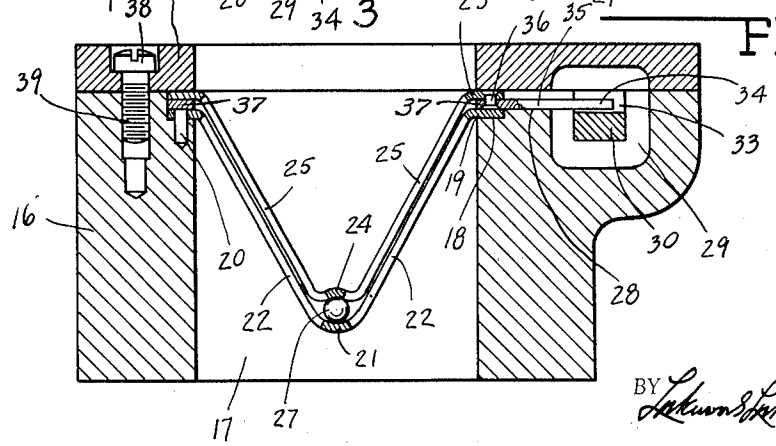


FIG. 3



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GOVERNOR DEVICE FOR ENGINES

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2 Claims. (Cl. 251—84)

This invention relates to a governor device for internal combustion engines.

The chief object of this invention is to govern the fuel supply to an internal combustion engine with minimum interference by the controlling mechanism to the passage of fuel to the engine.

The chief feature of the invention consists in the governor-controlled valve and its construction whereby minimum interference is obtained therefrom so that full power can be obtained from the engine at full throttle position.

Another object of the invention is to provide a common actuating mechanism for a plural supply control to internal combustion engine means of either the single engine type or multiple engine type.

Another feature consists in the valve and seat having forms that co-operate with the fuel mixture whereby in the passage of the same through the valve, there is imparted a swirling to the fuel stream which secures better carburetion thereof.

The full nature of the invention will be understood from the accompanying drawing and the following description and claims:—

In the drawing, Fig. 1 is a side elevational view of an internal combustion engine means of the single engine type provided with plural intakes and carburetors and with the dual fuel control associated therewith. Fig. 2 is an enlarged transverse sectional view taken on the line 2—2 of Fig. 1 and in the direction of the arrows. Fig. 3 is a sectional view taken substantially on the line 2—3 of Fig. 2.

In the drawing, 10 indicates an engine having a suitable exhaust manifold 11 and a pair of intake manifolds 12 each supplied by a carburetor construction 13. The governor construction is mounted on the engine and, projecting therefrom and operable thereby, is a control rod 15. Interposed between the intakes and the carburetors is a fuel control construction indicated generally by the numeral 16.

In the housing 16 there is provided a pair of passages 17 each having a cross sectional area equal to the intake inlet or the carburetor outlet and the housing 16 is suitably interposed therebetween. Formed in each passage in an annular groove 18 and seated therein is an annular flange 19. A suitable member 20 secures the flange rigidly in position. The flange 19 constitutes the upper and anchored end of a coaxially mounted conical valve seat terminating in a partially spherical apex 21. Between the flange 19 and the apex there is provided a plurality of segmental openings 22. These segmental openings equal in total area the area of the passage 17 or is at least equal thereto. The angularity of the cone or the inclination of the conical side of the valve seat just described will be determined by the size of the area of the passage.

A similarly shaped valve member includes the outer flange portion 23 seatable in the annular groove or recess 18 and the central or apex portion of the conical valve member terminates in an oppositely-directed, partially-spherical apex 24. The intermediate conical portion of the valve is also and similarly provided with sectored openings 25, the total area of which is at least equal to the cross sectional area of the passage 17.

Interposed between the two reversely-curved apex portions 21 and 24 is a pivotal support in the form of a bearing ball 27 which insures relatively frictionless rotation of the valve and also insures a predetermined spaced relation or minimum clearance between the valve and seat so that leakage therebetween is reduced to a minimum.

The body portion 16 includes a lateral passage 28 which communicates with a tangentially-arranged but offset chamber 29. Slidably mounted in chamber 29 is the actuating rod 30 which, at 31, is suitably coupled to the actuating member 15 of the governor. Suitable tubular protection may be provided as indicated at 32 for enclosing the operative connection 30 between the governor and the member 35. The actuating rod 35 includes a transverse groove 33 in which is seated the partially cylindrical end 34 of an arm 35 that is oscillatably movable in the passage 28. A ring 37 integral with arm 35 is suitably secured as at 36 to the flange 23 of the valve member for rotating the valve about its axis. Ring 37 is interposed between the flanges of the valve and seat positioned in the recess. When the actuating arm 35 is moved into a position where the portion 34 is positioned in the opposite end of the chamber 29, as indicated at y, all of the openings are closed and complete cutoff is effected.

For production and assembly purposes, there is provided a cover plate 137 which is suitably secured as at 38 and 39 to the body 16 of the valve construction.

As illustrated clearly in Figures 1 and 2, the rod 30 extends into a plurality of chambers 29, each of which has extending into the same the end 34 of the arm 35 of a valve member so that the single governor 14 is adapted through the single rod member 30 to actuate both valves simultaneously for controlling the fuel supply to the engine. As the engine speeds up beyond the predetermined speed, the governor rotates the valves to-

ward the left to reduce the fuel supply to the engine and as the speed falls below the predetermined speed, the rod 30 is moved to the right to gradually cause the valves to move to the full open position. Ease of operation is obtained and minimum clearance between the valve and the seat is maintained by the ball at the apex thereof. In certain instances, when engines are positioned close to each other and intakes are positioned close to each other, it is possible to connect the governor means of each engine to a common rod 30 and simultaneously operate both fuel control valves for obtaining predetermined combined engine performance.

The conical tapered valve and seat secure maximum turbulence by swirling the fuel stream as it passes through the valve and this secures improved carburetion without appreciable fuel flow interference.

The invention claimed is:

1. In an engine having a fuel supply passage, a valve body adapted to be mounted adjacent thereto and having an intake passage therein of a cross-sectional area at least equal to the supply passage, said valve body including a main portion and a complementary cover portion, said body including a chamber offset from the intake passage through the body and another passage laterally directed with reference to said chamber and said intake passage and open opposite ends to the same, a conical valve seat and a cooperating conical valve positioned within the intake passage and having outwardly-directed flanges seatable in a groove in the main body portion communicating with the intake passage and closed by the cover, and an arm connected to the valve flange and extending into the offset chamber for oscillation in the communicating lateral passage, and an actuating rod extending into said offset chamber and operatively associated with said arm for actuation thereof.

2. In an engine having a fuel supply passage, a valve body adapted to be mounted adjacent thereto and having an intake passage therein of a cross-sectional area at least equal to the supply passage, said valve body including a main body portion and a complementary cover portion, said body including a chamber offset from the intake passage through the body and another passage laterally directed with reference to said chamber and said intake passage and open opposite ends to the same, a conical valve seat and a cooperating conical valve positioned within the intake passage and having outwardly-directed flanges seatable in a groove in the main body portion communicating with the intake passage and closed by the cover, and an arm connected to the valve flange and extending into the offset chamber and oscillatable in the communicating lateral passage, an actuating rod extending into said offset chamber and operatively associated with said arm for actuation thereof, and an anti-friction element at the apex of said valve and seat and interposed therebetween for pivotally and spacedly supporting the valve upon the seat.

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