Jan. 29, 1924. 1,481,792

H. S. DAILEY

GOVERNOR FOR GAS ENGINES

Filed March 29 1922

Fig. 1.

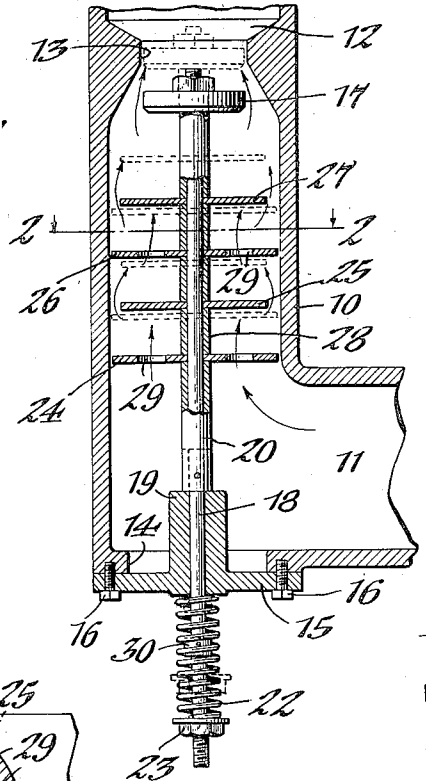


Fig. 2.

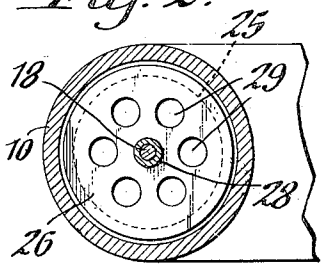


Fig. 3.

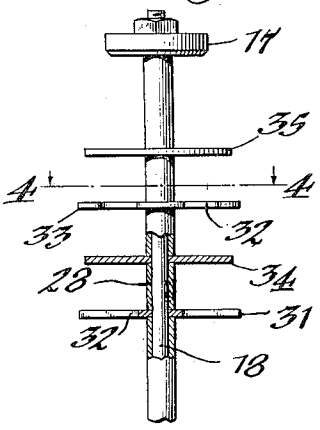


Fig. 5.

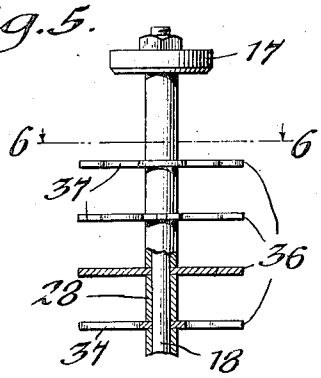


Fig. 6.

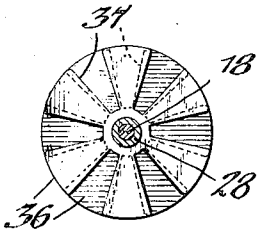
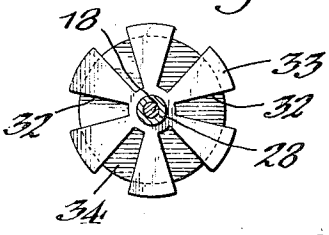


Fig. 4.



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UNITED STATES PATENT OFFICE.

HAROLD S. DAILEY, OF BARKER, NEW YORK.

GOVERNOR FOR GAS ENGINES.

Application filed March 29, 1922. Serial No. 547,040.

To all whom it may concern:

Be it known that I, HAROLD S. DAILEY, a citizen of the United States, residing at Barker, in the county of Niagara and State of New York, have invented new and useful Improvements in Governors for Gas Engines, of which the following is a specification.

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

One of its objects is to provide an improved automatic governor of this character which is very sensitive and efficient in operation, which is simple and durable in construction and which can be manufactured at a moderate cost.

A further object is to produce a device, which, while governing the amount of mixture admitted to the combustion chambers of the engine, will also effectively atomize or break up the fuel and intimately mix it with the proportionate amount of air.

In the accompanying drawings:

Figure 1 is a sectional elevation of a governor constructed in accordance with my invention. Figure 2 is a horizontal section on line 2—2, Fig. 1. Figure 3 is a fragmentary sectional elevation of a modified form of the improvement. Figure 4 is a horizontal section thereof, on line 4—4, Fig. 3. Figure 5 is a view, similar to Fig. 3, showing another modification of the device. Figure 6 is a horizontal section thereof, on line 6—6, Fig. 5.

Similar characters of reference indicate corresponding parts throughout the several views.

This improved governor is of the type which is responsive to or controlled by the suction of the engine for admitting more or less of the explosive charge thereto depending on its speed and load.

Referring to Figs. 1 and 2, the governor is preferably located in the intake manifold 10 of the engine whose lower or inlet end 11 communicates with a source of gas supply, while its upper or outlet end 12 communicates with the engine cylinder (not shown). Near its upper end the manifold is provided with a mixture outlet port 13, while in its lower end it is preferably provided with an opening 14 arranged in line with said port and normally closed by a cover plate 15 fastened to said manifold by bolts 16 or other appropriate fastenings.

Disposed centrally in the manifold or equivalent conduit and movable toward and from the mixture outlet port 13 is a throttle valve, preferably in the form of a plug 17, which is mounted at the upper end of a vertically slidable valve stem or rod 18. The latter is guided at its lower end in a bearing 19 carried by the cover plate 15. A stop sleeve 20, secured to the valve stem and abutting against the upper face of said bearing, serves to hold the valve in its normal wide open position, shown by full lines in Fig. 1. A spring 22 surrounding the lower exposed end of the valve stem and confined between the cover plate and an adjusting nut 23, tends to resist movement of the valve-disk out of said normal position.

Mounted on the stem 18 between the valve plug 17 and the cover plate 15 are a number of sets of governing disks or baffles 24, 25, 26, 27 which, by preference, are alternately large and small, the large disks 24 and 26 being substantially of the same diameter as the manifold 10. These disks are held in spaced relation by space-sleeves 28 or other appropriate means. The suction produced by the engine acts on these disks to raise the valve plug 17 toward its port 13 and decrease the amount of fuel charge delivered to the combustion chamber.

The large disks 24 are preferably provided with a plurality of openings 29 which are located opposite the solid small disks 25. By this arrangement, the engine suction is more effective on the several disks to obtain a prompt and sensitive action of the throttle-valve. Aside from this function, these disks also serve to retard the flow of the fuel through the intake manifold, causing it to be thoroughly atomized or broken up and intimately mixed. During its passage through the manifold, the fuel ascends through the openings 29 of the lowermost large disk 24 then impinges against the adjacent solid disk 25, by which it is broken up and deflected laterally. The fuel thence passes through the annular space between the edge of said solid disk and the wall of the manifold, thence through the openings of the next large disk, and against the next solid disk 27, by which it is again broken up and deflected, finally ascending around the edge of the last-named disk and passing into the engine cylinder. Two sets of disks are shown in the drawings by way of illustration, but a greater or less number may obviously be employed.

In order to prevent the throttle valve 17 from entirely closing the port 13 and thus completely shutting off the admission of fuel to the combustion chamber of the engine, said valve is preferably slightly smaller than its port, to leave a narrow passage between the wall of the port and the edge of the valve for the supply of a minimum amount of fuel for idling purposes, even when the valve is closed to maximum.

The valve stem 18 is provided between the cover plate 15 and adjusting nut 23 with a stop collar 30, as shown by dotted lines in Fig. 1, which stop is adapted to abut against said plate to limit the maximum closing movement of the throttle valve.

When the engine is traveling at high speeds, the resulting increased suction causes the atmospheric pressure to act on the governor disks 24—27, thus moving the throttle valve 17 upward into its port 13 to lessen the effective area of the latter and decrease the amount of fuel delivered to the engine. It follows that the engine speed is likewise reduced. When running at low speeds, the spring 22 overcomes the less powerful suction produced by the engine, thus resisting movement of the throttle valve out of its wide open position and admitting a full charge of fuel to the engine. It will be understood that by adjusting the tension of the spring 22, through the medium of the nut 23, the throttle valve may be regulated to automatically close at any desired predetermined engine speed.

In the modification shown in Figs. 3 and 4, the large disks 31, 33, similar to the disks 24 and 26 of the previously described construction, are provided with comparatively long radial slots or passages 32 extending inwardly from their outer edges instead of perforations, while the small disks 34—35 are solid, as in the preferred embodiment of the invention.

Instead of employing alternately large and small disks for each set, they may be made of one size, as shown in Figs. 5 and 6. In this instance, each of the disks 36 has long radial slots or passages 37 arranged out of register with the slots of adjacent disks; or in other words, the slots of each disk are located opposite the solid portions of the next disk, so that the fuel ascending through such slots or passages encounters said solid portions and is deflected laterally therefrom, repeatedly breaking up the fuel, as in the constructions previously described.

I claim as my invention:

1. A device of the character described, comprising a fuel conduit having an outlet port, a valve stem slidable in said conduit, a throttle valve mounted on said stem and movable toward and from said outlet port, and a plurality of baffle-disks mounted on said stem and arranged in sets, some of said disks having fuel-passages and others having solid portions located opposite the passages of the first-named disks.

2. A device of the character described, comprising a fuel conduit having an outlet port, a valve stem slidable in said conduit, a throttle valve mounted on said stem and movable therewith toward and from said outlet port, a series of spaced disks mounted on said stem in rear of said valve and arranged in sets, one disk of a set having fuel-passages and the companion disk having solid portions located opposite the passages of the first-named disk, and means for resisting movement of said valve toward its closed position.

3. A device of the character described, comprising a fuel conduit having an outlet port, a valve stem slidable in said conduit, a throttle valve mounted on said stem and movable therewith toward and from said outlet port, and a series of alternately-arranged large and small disks mounted on said stem, the small disks being solid and the large disks being provided with fuel-passages.

4. A device of the character described, comprising a fuel conduit having an outlet port at one end and an opening in line therewith at its opposite end, a cover plate applied to said opening, a valve stem slidably mounted in said plate, a throttle valve fixed to the inner end of said stem and movable therewith toward and from said outlet port, and a series of disks mounted on said stem between the valve and the cover plate and arranged in sets, one disk of a set having fuel-passages and the companion disk having solid portions located opposite said passages.

HAROLD S. DAILEY.