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GOVERNING DEVICE FOR INTERNAL COMBUSTION ENGINES.

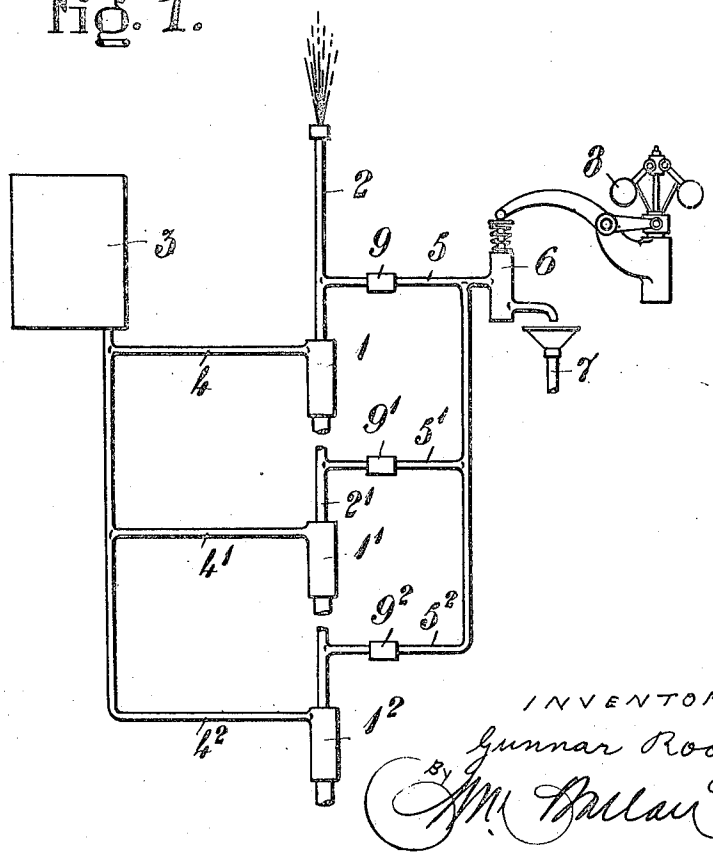
APPLICATION FILED JUNE 1, 1917.

1,299,230.

Patented Apr. 1, 1919.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

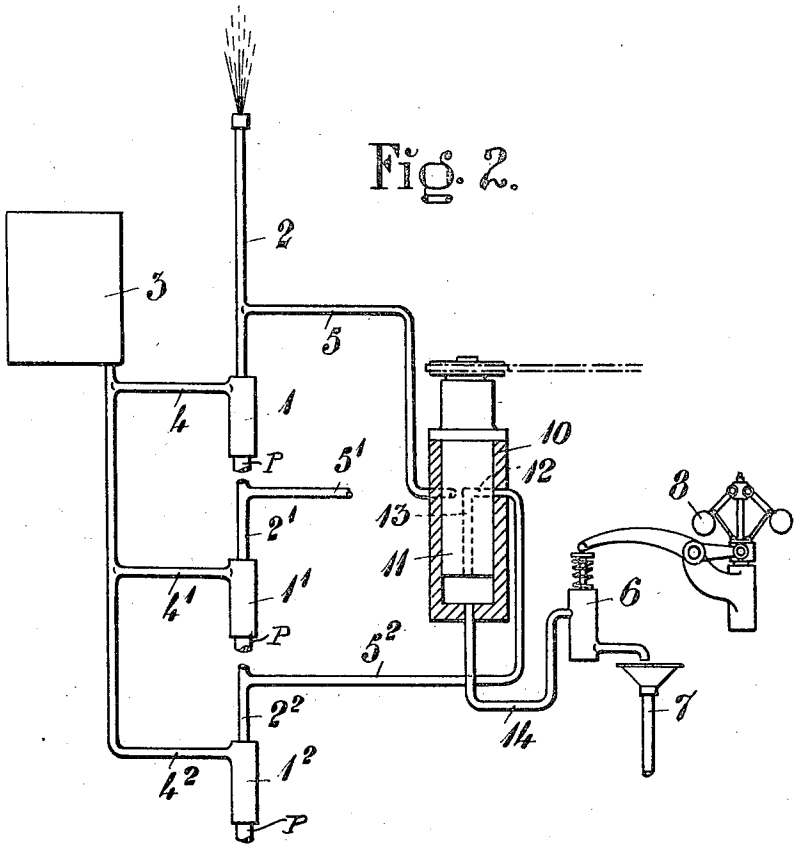
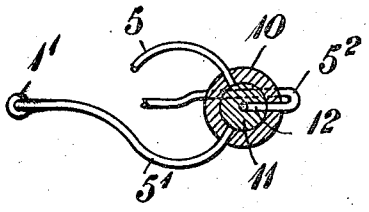


Fig. 3.



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UNITED STATES PATENT OFFICE.

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GOVERNING DEVICE FOR INTERNAL-COMBUSTION ENGINES.

1,299,230. Specification of Letters Patent. Patented Apr. 1, 1919.

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To all whom it may concern:

Be it known that I, GUNNAR ROOS, a subject of the King of Sweden, residing at 1 Heimdalsgatan, Stockholm, Sweden, have invented new and useful Improvements in Governing Devices for Internal-Combustion Engines, of which the following is a specification.

The present invention has for its object to provide an improved governing device for the supplying of liquid fuel to internal combustion engines and relates especially to certain improvements of an already known type of such devices for making it possible to govern the supply of fuel to any number of cylinders or cylinder-sides.

In governing devices with which I am familiar, they are incapable of governing the supply of fuel to more than one cylinder, but the present invention now has for its purpose to remove this inconvenience. The invention is characterized thereby that the different nozzle pipes, running to different cylinders or sides of cylinder, are connected to the common exhaust valve, whereby each connection is provided with an automatic or controlled valve, working in such a manner that the different nozzle pipes will communicate with the exhaust valve during the injection of fuel, while communication between the nozzle-pipes and the exhaust valve is closed during the remaining period of the cycle.

I will describe two forms of apparatus embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a view showing in side elevation one form of apparatus embodying my invention.

Fig. 2 is a view showing in side elevation and partly in section, a modified form of apparatus embodying my invention.

Fig. 3 is a transverse sectional view of the piston shown in Fig. 2.

Similar reference characters refer to similar parts in each of the several views.

In the construction according to Fig. 1 the fuel injecting means 1, 1^1, 1^2 for the different cylinders are connected to the fuel tank 3 by means of feed pipes 4, 4^1, 4^2. Each of the nozzle-pipes 2, 2^1, 2^2 is connected to a pipe 5, 5^1, 5^2, which pipes are united before the common exhaust-valve 6. According to the invention automatic check-valves 9, 9^1, 9^2 are inserted in the different overflow pipes 5, 5^1, 5^2 between the nozzle-pipes and the exhaust valve 6, whereby it will be possible to govern the supply of fuel to the different cylinders, independently of each other. It is to be understood that the injectors 1 are actuated at predetermined intervals by plungers P, through suitable mechanism to inject fuel through the respective nozzle pipes 2 and into the respective cylinders of an internal combustion engine.

If, when the machine is running, the load would for instance decrease, the velocity of the governor 8 increases and the exhaust valve 6 is opened. Presuming that in the present instance the fuel injector 1^2 is ready for injecting fuel in its cylinder, the fuel injecting also takes place during the same part of the stroke as previously but the quantity of injected fuel is diminished, as a part of the said fuel flows through the pipe 5^2 and the check-valve to the exhaust valve 6, from which the fuel is brought back to the tank 3 in a suitable manner for instance through the pipe 7.

If the pipes 5, 5^1 did not contain any check valves 9, 9^1 a portion of the fuel running to the exhaust valve 6 would enter the nozzle-pipes 2, 2^1 and the corresponding cylinders, at which the pistons in this moment are not in a position ready for fuel-injection.

This inconvenience is removed by the use of the check-valves 9, 9^1, 9^2, and thus the fuel-injection of the different cylinders can be governed by a common exhaust valve and by a common governor, which previously has not been possible.

In the construction illustrated in Figs. 2 and 3, a common controlled, revolving valve is used, to which the different pipes 5 from the nozzle-pipes 2 are connected. This revolving valve consists of a casing 10, in which the pipes 5, 5^1, 5^2 open and a revolving piston 11, which is driven from the engine shaft. This piston 11 is provided with a transverse channel 12 and a longitudinal channel 13, communicating with the former and leading to the bottom of the casing 10, where a pipe 14 communicating with the exhaust valve 6 opens. Consequently at the rotation of the piston 11, the pipes 5, 5^1 and 5^2 in due order will be placed in communication with the ex-

haust valve 6 through the channels 12, 13 and the pipe 14. By a suitable adjustment of the piston 11 in relation to the engine-pistons it will evidently be possible to hold the conduit between the different nozzle-pipes 2, 2^1 and 2^2 and the exhaust valve open during the fuel injection, while it else is closed.

The construction of the piston 11 and the means for turning the same of course are of no importance, and consequently any special arrangements of these parts are not shown or described.

Of course it is not necessary to arrange the valves as illustrated. So for instance the valve 6 can be combined with the revolving valve by letting the governor 8 work directly upon this valve, which for that reason also must be axially movable.

Having now particularly described the nature of my invention and the manner of its operation, what I claim is:

1. A fuel feeding and governing device for multi-cylinder internal combustion engines comprising a fuel tank, injectors, pipes connecting said tank and injectors, an overflow pipe common to all of said injectors, branch pipes connecting said injectors and said overflow pipe, check valves in each of said branch pipes for preventing passage of fuel from said overflow pipe to said injectors, a valve in said overflow pipe, a speed responsive device controlling said valve, and a return pipe connecting said tank and overflow pipe.

2. A fuel feeding and governing device for multi-cylinder internal combustion engines comprising a plurality of fuel injectors, an overflow pipe common to all of said injectors, a valve in said overflow pipe, branch pipes connected to said injectors, means for successively connecting and subsequently disconnecting said branch pipe from said overflow pipe, and a speed responsive device controlling said valve.

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

GUNNAR ROOS.

Witnesses:
HARRY HAMMAR,
ADA SIMON.