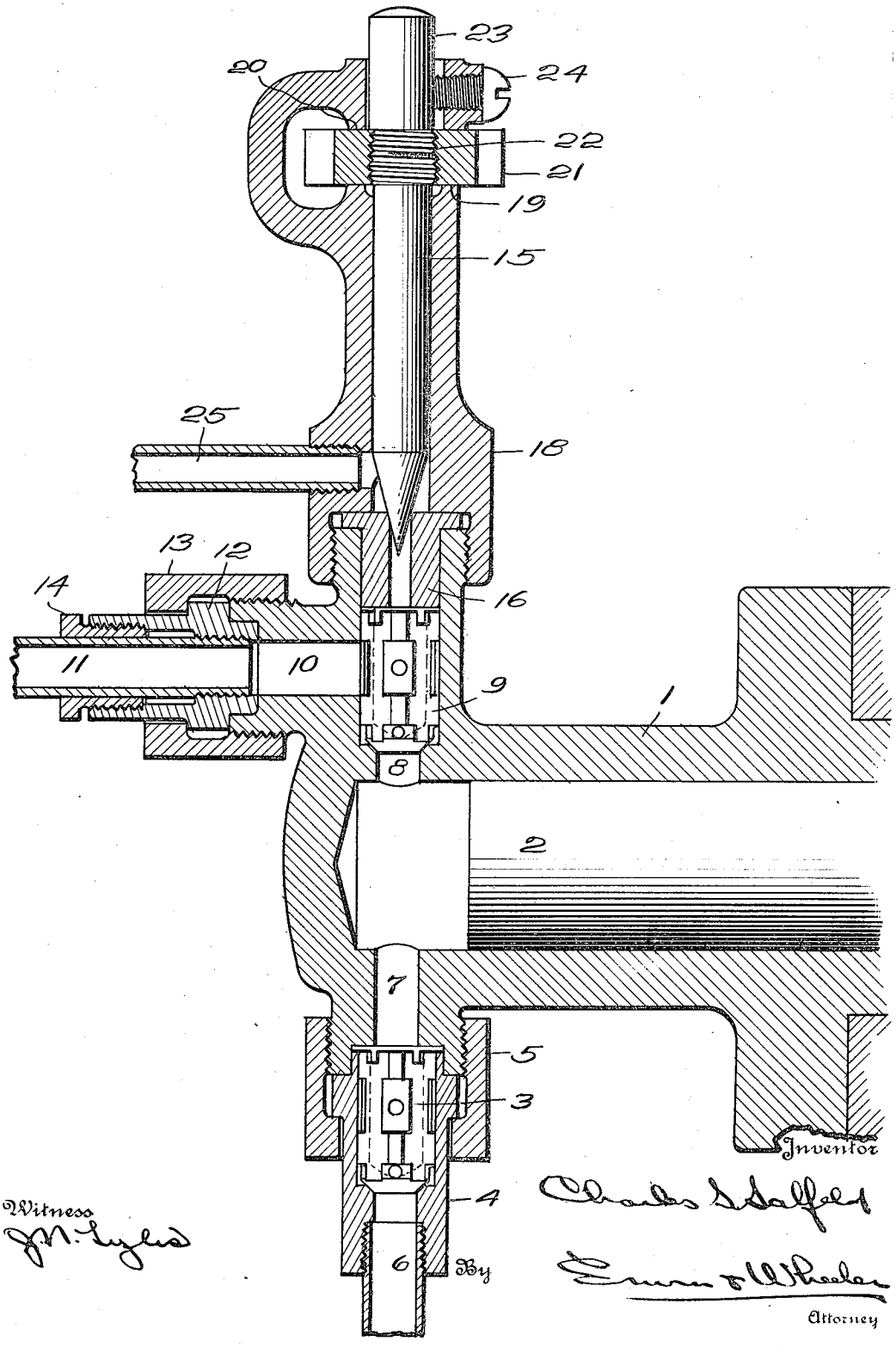
C. S. SALFELD.

GOVERNING APPARATUS FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JUNE 8, 1914.

1,267,460. Patented May 28, 1918.



Witness

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CHARLES S. SALFELD, OF MILWAUKEE, WISCONSIN.

GOVERNING APPARATUS FOR INTERNAL-COMBUSTION ENGINES.

1,267,460. Specification of Letters Patent. Patented May 28, 1918.

Application filed June 8, 1914. Serial No. 843,779.

To all whom it may concern:

Be it known that I, CHARLES S. SALFELD, a German citizen, residing at 274 Tenth street, Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Governing Apparatus for Internal-Combustion Engines, of which the following is a specification.

My invention relates to governing apparatus for internal combustion engines in which liquid fuel is injected into the combustion chamber.

The object of my invention is to procure a simple and inexpensive governing gear that can be used in combination with a high-pressure fuel injection pump without being subject to violent reactions due to the heavy load on the pump.

The accompanying drawing is a longitudinal section showing the rear part of a fuel injection pump with suction and delivery valves and a governor valve constructed in accordance with this invention.

1 is the rear part of a fuel injection pump and 2 is the rear part of a pump plunger, 3 is a suction valve and 4 a seating for same attached to the pump body 1 by means of a union nut 5 and having screwed into it a suction pipe 6. 7 is a suction port and 8 a delivery port, 9 a delivery valve, 10 another delivery port and 11 a delivery pipe screwed into a pipe union 12 and attached to the pump body by means of a union nut 13. 14 is a pipe gland to prevent leakage of oil. The delivery valve 9 discharges oil through pipe 11 against a very high pressure, due to the pipe being closed by an adjustable check valve taking the form of a fuel injector. A governor valve 15 is arranged above the delivery valve 9 and provided with a seating 16 containing an overflow port 17. The seating 16, which also serves to limit the lift of the delivery valve 9, is attached to the pump body 1 by being clamped between it and a governor valve standard 18, which latter is screwed on to the pump body 1. The governor valve standard 18 is carried well above and at its upper end is forked and provided with two machined faces 19 and 20 rectangular to the axis of the valve 15 between which is inserted a governor valve pinion 21 which is also screwed to the governor valve 15 by means of thread 22 and which meshes with a gear 22^a carried on a shaft 22^b which is connected with a governor (not shown). The upper end of the governor valve 15 is flattened at 23 and a flat ended screw 24 is inserted through the upper fork of the standard 18 so as to perform the function of a feather key in guiding the governor valve 15 and preventing it from turning with the pinion 21. It will thus be seen that when by extraneous means the governor pinion 21 is rotated the governor valve 15 will move up or down in accordance with the amount and direction of movement imparted to the pinion 21. An overflow pipe 25 communicates with the overflow port 17 when the governor valve 15 is off its seat and is led to the main fuel tank.

The action of the gear is as follows: By the application of suitable means, which may be of any kind and do not form part of this invention, connection is established between the engine governor and the governor pinion 21 by means of the pinion 22^a and shaft 22^b in such a manner that the governor valve pinion 21 is rotated in accordance with the movement of the governor sleeve. When, therefore, under the influence of a gain in speed the engine governor moves "out" the governor valve 15 moves "up," and when the engine governor returns to its "inner" position the governor valve 15 goes "down." The thread 22 must be so directed as to obtain this result and must be either "right hand" or "left hand," according to the nature and position of the governor connections. The movement of the governor valve 15 need be slight. According to the position of the governor valve 15, either the whole amount of fuel oil delivered through the deliery valve 9 is injected into the combustion chamber or merely part of same and the amount not so injected is by-passed through the overflow port 17 and overflow pipe 25 back to the fuel tank.

The governing gear may be used in combination with any type of fuel injector, whether the fuel is injected by means of compressed air or by the sole action of a fuel injection pump, and is applicable to both single-cylinder and multi-cylinder engines. It is equally suitable for two-cycle or four-cycle engines.

I claim:—

1. A speed governing appliance for internal combustion engines comprising the combination of a fuel injection pump, a pump plunger working therein, a suction valve, a delivery valve, and a governing

valve provided with screw thread, a toothed pinion provided with corresponding screw thread and arranged to actuate said valve axially, and means to effect a rotative movement of said pinion in accordance with changes in the speed of the engine.

2. A speed governor appliance for internal combustion engines comprising the combination of a fuel injection pump casing having a delivery passage, a pump plunger in the casing, a delivery valve reciprocable in the delivery passage and adapted to seat at the inner end of said passage, a needle valve seating sleeve in the other end of the passage, a flange on the outer end of the sleeve engaging against the pump casing, a tubular member threaded on the pump casing and clampingly engaging said needle valve seating sleeve, a needle valve slidably mounted in the tubular member and adapted to seat against said sleeve, and means for operating the needle valve.

In testimony whereof I affix my signature in the presence of two witnesses.

CHARLES S. SALFELD.

Witnesses:

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