No. 696,903. Patented Apr. 1, 1902.

H. H. HENNEGIN.

SPEED REGULATOR FOR GAS ENGINES.

(Application filed June 27, 1901.)

(No Model.)

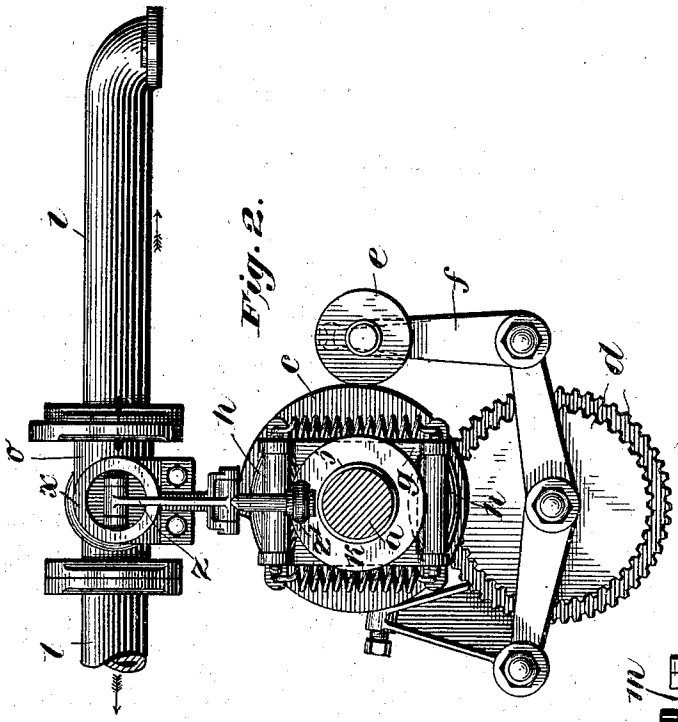


Fig. 2.

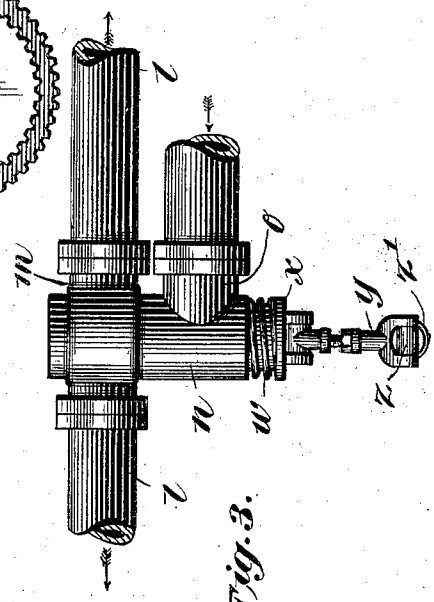


Fig. 3.

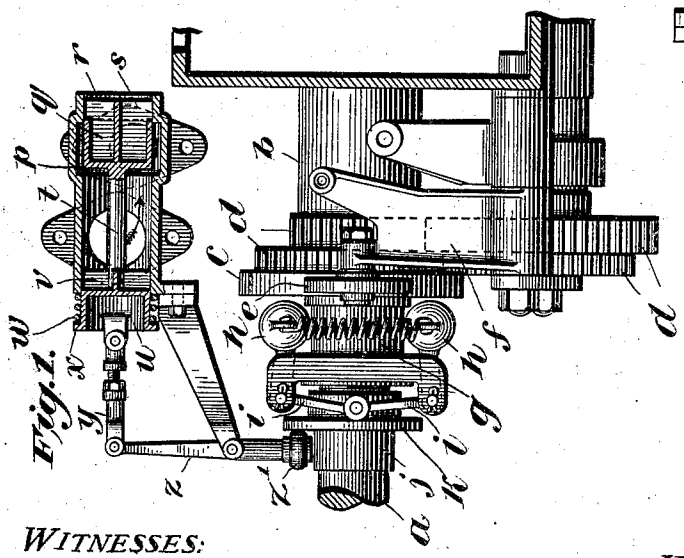


Fig. 1.

WITNESSES:

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SPEED-REGULATOR FOR GAS-ENGINES.

SPECIFICATION forming part of Letters Patent No. 696,903, dated April 1, 1902.

Application filed June 27, 1901. Serial No. 66,244. (No model.)

To all whom it may concern:

Be it known that I, HERBERT H. HENNEGIN, a citizen of the United States of America, residing at Anderson, in the county of Madison, State of Indiana, have invented certain new and useful Improvements in Speed-Regulators for Gas-Engines, reference being had to the accompanying drawings, in which—

Figure 1 is a view, partly in section and partly in side elevation, showing my speed-regulating devices and the adjacent parts of a two-cylinder explosive-gas engine; Fig. 2, a side elevation of the same, and Fig. 3 a plan view of the regulating-valve and connecting-pipes.

The object of this invention is to provide simple speed-governing devices especially adapted for that class of gasolene explosive-engines in which a pair of end-to-end cylinders are employed and the explosive mixture is supplied to them through a common pipe, the governing-valve being placed at the juncture of said pipe with the pipe leading from the mixing cup or device, and the principle upon which this apparatus operates is to weaken or dilute the supply of explosive mixture to the cylinder-pipes by opening a valve and admitting into the same more or less air, according to the excess above normal in the speed of the engine, as more fully hereinafter set forth.

Referring to the annexed drawings by letters, *a* designates the main shaft, and *b* one of the bearings therefor cast on the cylinder-body; *c*, a sparker-cam receiving rotation through the reducing-gears *d* from the main shaft; *e*, a roller bearing on the cam and connected to the sparking-lever *f*, and *g* a sleeve affixed to the main shaft and carrying the spring-connected governor-weights *h*, whose forked arms *i* embrace and are pivotally connected to a sleeve *j*, adapted to slide on the main shaft *a*, this sliding sleeve being provided with an annular flange *k*.

The cylinder branches *l* of the supply-pipes are connected to each other by a coupling *m*, which carries a transverse horizontal tubular valve-casing *n*, open at both its ends and connected near one of its ends to the branch *o* of the supply-pipe leading from the mixer or vaporizer. The branches *l* of the supply-pipes have free communication with the branch-pipe *o* through the coupling *m* and the tubular valve-casing *n*, and the direction of the flow of the explosive mixture or gas is shown by the arrows. Coincident with the point of connection of the valve-casing *n* to the coupling *m* the valve-casing is annularly enlarged, forming an internal chamber *p*, in which works one of two reciprocating valves *q*, which is cylindrical in shape and fits and slides in the adjacent open end *r* of the valve-casing, and is guided in this opening by a spider-guide *s*. A stem *t* connects the valve *q* to a similar-shaped valve *u*, working in and normally closing the other end of the valve-casing *n*, this valve being also provided with a spider-guide *v*. Surrounding this valve *u* is a coil-spring *w*, which is confined between an outward-turned annular flange *x* on the outer end of the valve and the end of the valve-casing.

Pivotally connected to valve *u* is an actuating-rod *y*, and connected to the outer end of the rod *y* is a lever *z*, which is provided at its lower end with a roller *z'*, which normally bears upon the outer face of flange *k*.

When the engine is running under normal speed, the weights are normally held by their connecting-springs near to or against sleeve *g*, which keeps flange *k* pressed against roller *z'* and holds valves *u* and *q* normally closed against the action of spring *w*. When the speed rises beyond normal, the weights *h* swing radially outward and draw sleeve *j* inward toward sleeve *g*, thereby permitting spring *w* to open the valves *u* and *q* and admit air to the valve-casing, so that on the suction-stroke of the engine more or less air will be drawn into pipes *l*, and thereby weaken or dilute the supply of explosive mixture to the engine, and thus nicely control its speed. It will be observed that the air thus let into the cylinder will either weaken the explosion or entirely prevent it, according as the air is admitted in smaller or larger quantities.

Having thus fully described my invention, what I claim, and desire to obtain by Letters Patent, is—

1. In a speed-regulating apparatus for a gas-engine, the combination of a pipe leading to the engine-cylinder, a supply-pipe, an open-

ended valve-casing connecting these two pipes, a valve working in each open end of this valve-casing, one inward and the other outward and adapted to admit air into both ends of the cylinder-valve casing, a spring tending to open these valves, and means for permitting the valves to open automatically when the speed of the engine increases beyond normal.

2. In a gas-engine, the combination of an open-ended valve-casing interposed in the gas-supply pipes, a valve fitting and working in each open end of the valve-casing, a spring normally tending to open the valves, and means for permitting the spring to act and open the valves when the speed of the engine increases beyond a predetermined degree.

3. In combination with a gas-engine, a shaft operated thereby, spring-retracted governor-weights on said shaft, a flanged sleeve actuated by said governor-weights, supply-pipes for the explosion mixture and an air-admitting valve in said supply-pipes, means tending to open said valve to admit air, and means normally bearing on the flange carried by said sleeve and adapted to permit the valve to open when said flanged sleeve is actuated.

4. In a speed-regulator for gas-engines the combination of a supply-pipe, an air-admitting valve therein, a spring tending to open this valve, and means adapted to release the valve and permit the spring to open the valve when the speed increases beyond normal.

5. In a speed-regulating apparatus for a gas-engine, the combination of a pipe leading to the engine-cylinder, a supply-pipe, a valve-casing connecting these two pipes and open at both ends, a valve working in each open end of this valve-casing, one opening inward and the other outward and both adapted to admit air into the valve-casing, and means for simultaneously opening these valves when the engine reaches abnormal speed.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 24th day of June, 1901.

HERBERT H. HENNEGIN.

Witnesses:

JAMES F. BOHN,

E. W. LONGANECKER.