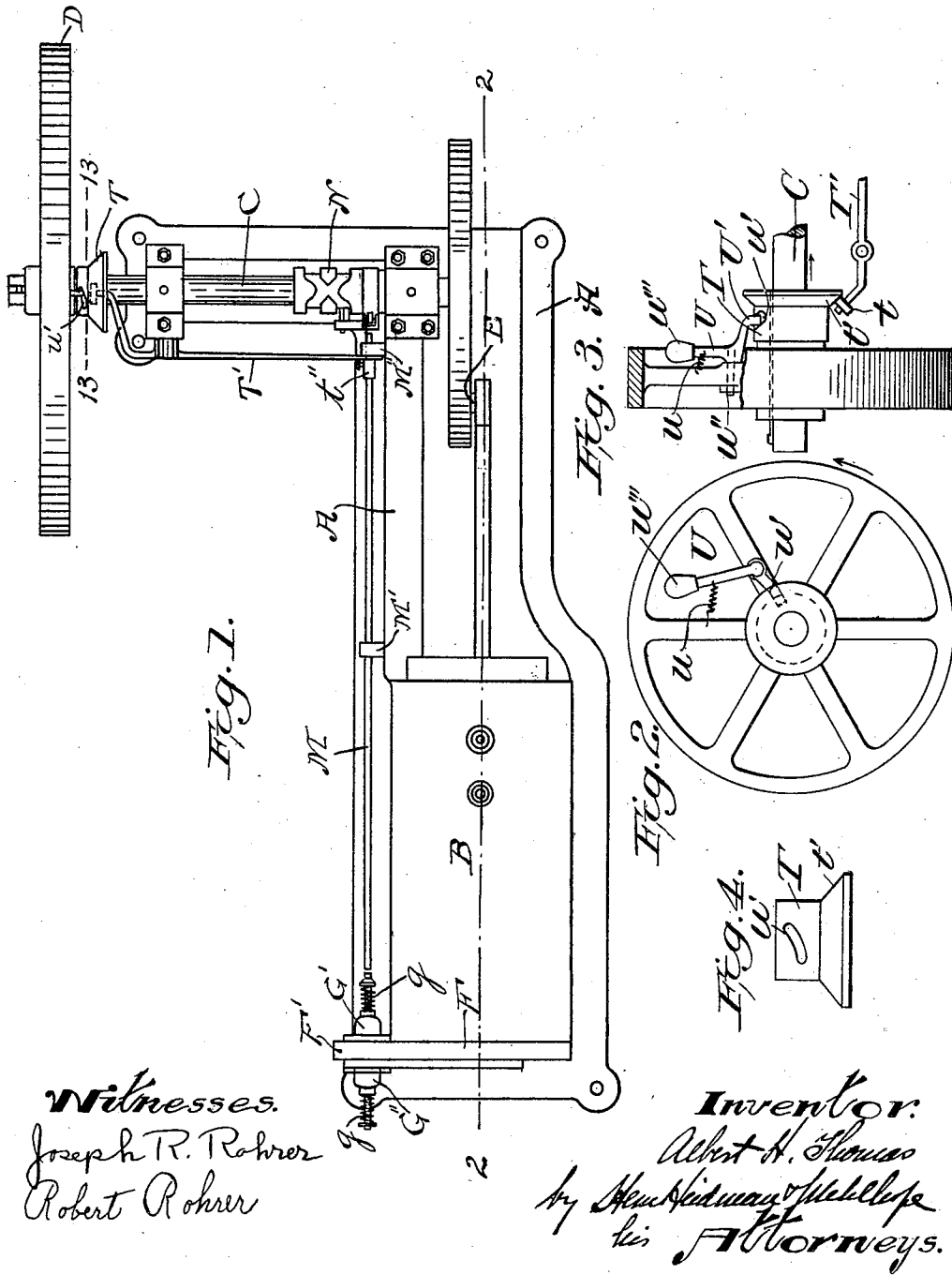


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SPEED REGULATOR FOR GAS ENGINES.
APPLICATION FILED MAY 29, 1906.

1,005,362.

Patented Oct. 10, 1911.



Witnesses.
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UNITED STATES PATENT OFFICE.

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SPEED-REGULATOR FOR GAS-ENGINES.

1,005,362.

Specification of Letters Patent.

Patented Oct. 10, 1911.

Application filed May 29, 1905. Serial No. 262,787.

To all whom it may concern:

Be it known that I, ALBERT H. THOMAS, a citizen of the United States, and a resident of Springfield, in the county of Clark and State of Ohio, have invented a certain new and useful Improvement in Speed-Regulators for Gas-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of my specification.

My invention relates to gas engines, and more particularly to the arrangement by which the speed of the engine is controlled. The object of my invention is to provide an engine with a speed controller of simple and economical construction, which will control the speed through the exhaust valve, whereby upon the overloading of the engine the exhaust valve is held open, so as to prevent anything but air from going into the cylinder. By such an arrangement, when the engine is running light, the valves are standing still, a great saving in the wear on the valve being thereby produced.

The advantages of my improvement will appear more clearly as I proceed with my specification.

In the drawings:—Figure 1 is a top plan view of a gas engine with my improvements attached; Fig. 2 is a vertical section of Fig. 1 on the line 2—2; Fig. 3 is a section of Fig. 1, on the line 13—13 thereof; Fig. 4 is an edge view of Fig. 3, partly in section, showing the governor mechanism.

I have illustrated my improvement by showing it in connection with a single cylinder, four cycle gas engine, but of course, I do not wish to limit my improvement to this particular type of engine. It will be apparent as I proceed, that it may be applied to any gas engine.

In the drawings, and referring particularly to Fig. 1, A and B are the bed and cylinder of the engine, preferably cast together, C the driving shaft, D the fly-wheel, and E the crank-pin. These parts are of the usual construction and arrangement, and no further description of them is necessary.

F indicates the cylinder-head which projects beyond the cylinder at one side, as at F', (see Fig. 1), and to this projecting part are attached on opposite sides, the exhaust valve, and inlet valve.

G' is the exhaust valve and G'' is the inlet valve. Said valves are in line with each other, and communicate with an opening in the cylinder-head, which leads into the cylinder. These valves are of the usual type and are normally held closed by springs *g*. The inlet valve G'' is a suction valve, and is opened by the suction of the piston. The exhaust valve G' is opened at intervals by a rod M, which is slidingly supported in suitable brackets M', M'', which are attached to the frame of the engine. This rod is intermittently operated so as to open the exhaust valve in any convenient manner. I do not claim any particular method of doing this in the present application, as claims for the same are filed in a separate application.

A spool T is splined to the shaft C. A governor U is pivoted to one spoke of the shaft and is connected to the next spoke by a spring *u*, and a lever T' pivoted to the frame of the machine and provided with a roller *t* at one end is adapted to engage the beveled end *t'* of the spool T. The opposite end of the lever T' is adapted to engage, as will be described, a lug *t''* secured to the rod M. A cam groove *u'* in the spool T controls the operation of this device. The governor U comprises a bell-crank-lever pivoted at *u''* to a spoke of the driving wheel, one end of which lever is provided with a governor ball *u'''*, and the other end of which is provided with a detent U' which engages the cam groove *u'* in the spool T.

The operation of this mechanism is as follows:—As the fly-wheel rotates in the direction of the arrow in Fig. 3, the tendency of the governor ball *u'''* is to lag behind, but the spring *u* is of sufficient strength to prevent such lagging except when the engine runs too fast or above speed. Upon such running of the engine above speed, the governor ball *u'''* moves away from the spoke of the wheel, its tendency being to fly farther from the center of the wheel, thereby causes the detent U' of the lever U to travel in the slot *u'*, and thereby force the spool T along the shaft C in the direction of the arrow (see Fig. 4). This results in forcing the roller *t* to ride upon the inclined flange *t'* of the spool T and in dropping the normally free end of the lever T' behind the lug *t''* secured to the rod M, thereby holding said rod in a position such that the exhaust valve

G' is held open. The exhaust valve G' being open, it is impossible for the piston to exert the suction which opens the inlet valve G''. No fuel is thus permitted to enter the engine until it drops to normal speed again. Upon dropping to speed the ball *u'''* is again brought to its normal position which causes the spool T to again come to its normal position, thereby forcing the roller back to its normal position, which raises the end of the lever T' and disengages it from the lug *t''*. The rod M is then brought into position to be again acted upon by the valve controlling mechanism, and the engine operates as before.

Having thus described my invention, what I desire to claim as new, and cover by Letters Patent, is:—

1. A mechanism controlling the speed of an engine, comprising in combination with the fly-wheel, driving shaft and a sliding valve-operating rod, a bevel-ended spool splined to the driving shaft, a lever pivoted adjacent said driving shaft and adapted to engage at one end a lug on said rod and at the other end provided with a roller adapted to engage the beveled end of said spool, and a governor mechanism adapted upon the speeding up of the engine to throw said spool so as to permit the end of said lever to engage said lug on said rod.

2. A mechanism adapted to control the speed of an explosive engine, comprising in

combination with the fly-wheel, driving shaft, and a sliding valve-operating rod, a spool having a beveled end and splined to said shaft, a governor secured to said fly-wheel and adapted upon the speeding up of the engine to throw said spool along said shaft, a lever pivoted adjacent said shaft having one end adapted to engage a lug on said sliding valve-operating rod and at the other end a roller engaging the bevel of said spool whereby upon the speeding up of said engine its opposite end engages said lug, substantially as described.

3. A mechanism for controlling the speed of an explosive engine, comprising in combination with the driving shaft, fly-wheel mounted thereon, and valve operating rod, of a bevel-ended spool splined to said shaft and provided with an inclined slot, a lever pivoted adjacent said shaft having one end adapted to engage said valve rod and the other end provided with means for engaging the bevel end of said spool, and a governor mechanism for actuating said spool to operate said lever, said governor mechanism comprising a weighted lever pivoted to the fly-wheel and having a detent projecting into the slot in said spool.

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