

No. 725,669.

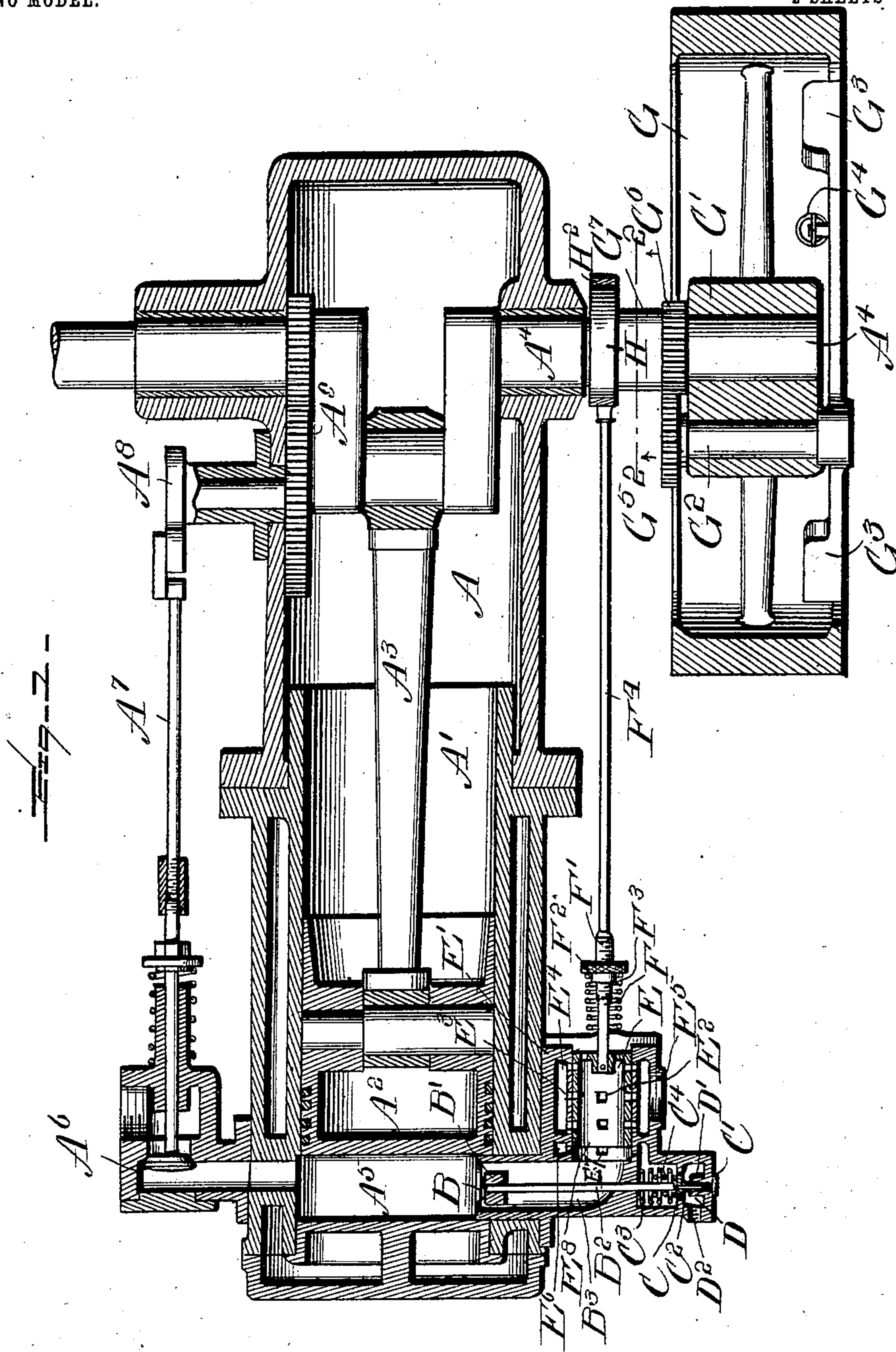
PATENTED APR. 21, 1903.

L. F. BURGER.
SPEED GOVERNING MECHANISM.

APPLICATION FILED MAR. 27, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES.

Wm F. Doyle.
Alfred T. Gage.

INVENTOR

Leopold F. Burger,
BY *E. B. Stocking* Attorney

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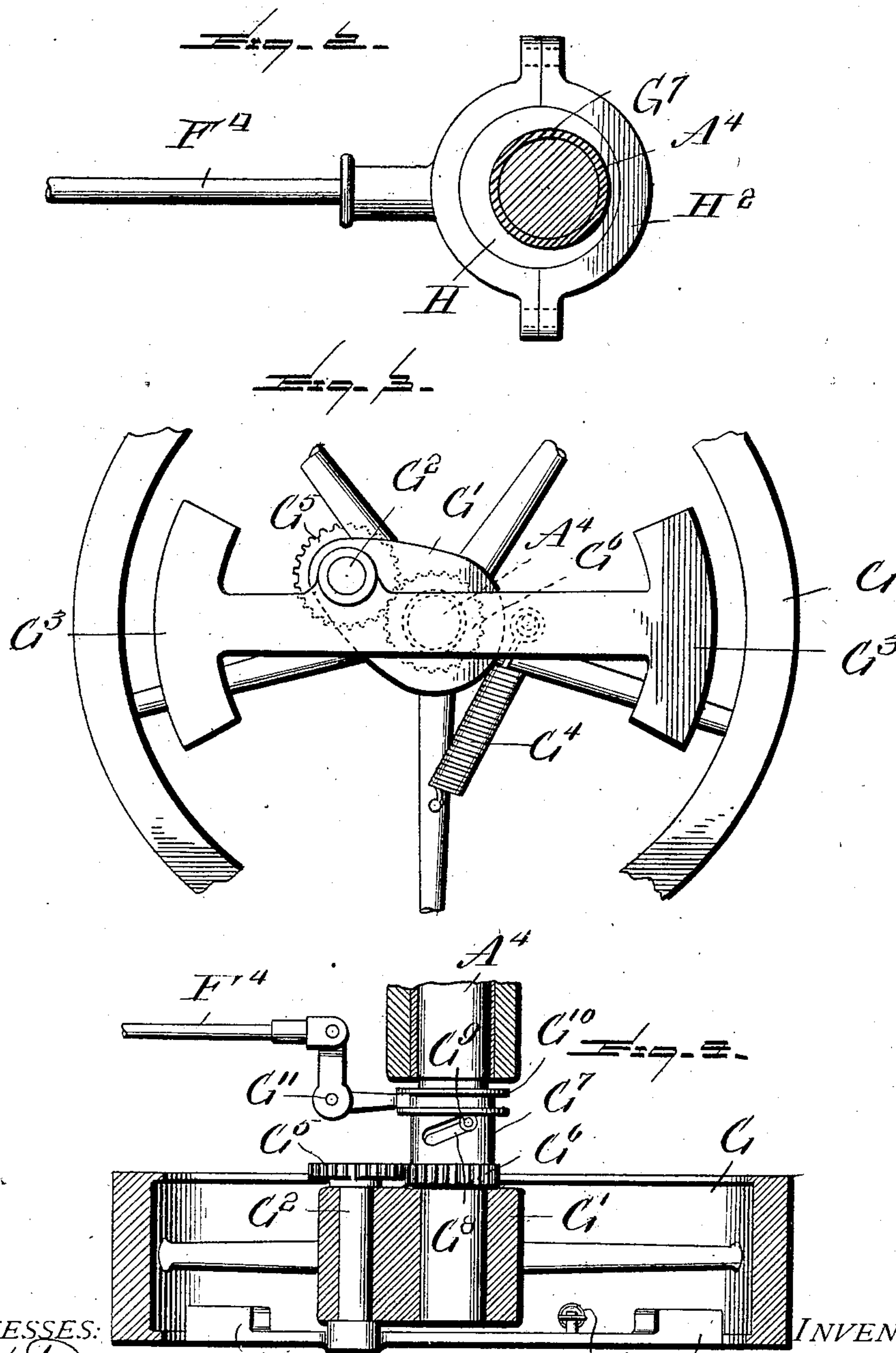
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INVENTOR

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UNITED STATES PATENT OFFICE.

LEOPOLD F. BURGER, OF ANDERSON, INDIANA, ASSIGNOR TO WOOLLEY
FOUNDRY AND MACHINE WORKS, OF ANDERSON, INDIANA.

SPEED-GOVERNING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 725,669, dated April 21, 1903.

Application filed March 27, 1902. Serial No. 100,242. (No model.)

To all whom it may concern:

Be it known that I, LEOPOLD F. BURGER, a citizen of the United States, residing at Anderson, in the county of Madison, State of Indiana, have invented certain new and useful Improvements in Speed-Governing Mechanism, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to a speed-governing mechanism particularly adapted for controlling a valve mechanism upon a gas or other engine.

The invention has for an object to provide 15 an improved construction wherein the governor is pivotally mounted eccentrically to the axis of the fly-wheel and the shaft of this governor geared to actuate suitable connections for shifting the controlling-valve.

20 A further object of the invention is to provide a novel construction of rotatable sleeve-carrying means for actuating or imparting a reciprocating motion to a valve.

Other and further objects of the invention 25 will hereinafter appear and the novel features thereof will be pointed out by the appended claims.

In the drawings, Figure 1 is a horizontal section through an engine embodying this invention; Fig. 2, a detail vertical section on 30 the line 2 2 of Fig. 1. Fig. 3 is a detail elevation of the fly-wheel and governor shown in Fig. 1, and Fig. 4 is a detail horizontal section showing a modified form of sleeve for 35 transmitting power to a valve.

Like letters of reference refer to like parts throughout the several figures of the drawings.

40 The present invention is capable of application to any desired class of engines and governing-valves, but for the purpose of illustration is herein shown in connection with an engine comprising a casing A, having therein a cylinder A' and a piston A², connected by a 45 pitman A³ with a crank-shaft A⁴. The closed end of the cylinder A' is provided with a combustion-chamber A⁵, communicating with an exhaust-valve A⁶, adapted to be operated by a rod A⁷, bearing against a cam A⁸, suit-

ably driven from the crank-shaft A⁴ by means 50 of a gear A⁹.

Communicating with the combustion-chamber A⁵ is an intake-valve B, suitably supported by a cross-bar B' and having an extended stem B², extending through a mixing-chamber B³. This stem carries at its lower end a 55 fuel-valve C, slidingly mounted thereon, while below the valve C a nut C' is provided which is adapted to travel with the stem within a tubular guide D', provided within the fuel- 60 chamber D at the lower portion of the valve-casing. The valve C is provided with a tubular stem C², surrounding the stem B² of the inlet-valve B and disposed within the guide D', while the fuel is admitted to the chamber 65 D by a suitable inlet, as shown at D². Both the valves B and C are restored to their seats by means of a coiled spring C³ between the face of the valve C and the end wall of the 70 mixing-chamber B³. Within the spring C³ a shorter and heavier spring C⁴ is placed, which in the opening movement of the valves forms a cushion to check the force thereof, thus causing the valves to stop very easily and 75 quietly to prevent crystallization of the parts thereof.

One form of governing-valve E is herein shown and is slidingly mounted within a casing E' at one side of the mixing-chamber B³ and provided with a series of ports E², adapted 80 to register with ports E³, communicating with the air-chamber E⁴ in the casing E, into which the air is admitted by a suitable opening at E⁵. The casing E' is provided with a separate gas or fuel chamber E⁶, communicating by ports E⁷ with the mixing-chamber, 85 which ports are adapted to be covered by the end E⁸ of the sliding governing-valve, thus producing a governing-valve for controlling the entrance of air and fuel into the mixing- 90 chamber and a structure in which a single movable part controls the entrance of the explosive mixture, and consequently the speed of the engine.

The valve E is provided with a stem F, hav- 95 ing thereon a threaded portion F', adapted to carry an adjusting-nut F², between which and the casing E' a tension-spring F³ is inter-

posed, and by adjusting the nut F^2 the tension of the spring F^3 may be varied and the amount of power necessary to shift the regulating-valve consequently controlled. The valve-stem F is extended beyond the threaded portion to form a connecting-rod F^4 , extending to a speed-governing mechanism carried by a fly-wheel G upon the crank-shaft A^4 of the engine. The speed-governor is mounted upon the fly-wheel, eccentrically to the axis thereof, by means of a block G' , in which the shaft G^2 is journaled, said shaft bearing at one end the weighted arms G^3 , which are connected with a fixed part of the wheel by means of a spring G^4 , Fig. 3, and at the opposite end is provided with a pinion G^5 , meshing with a similar pinion G^6 , carried by a rotatable sleeve G^7 , supported upon the crank-shaft A^4 . This sleeve is provided with an eccentric H , secured thereon, which may be shifted and held in any desired position by the rotary movement of the sleeve G^7 , while surrounding the eccentric and carried by the valve-rod F^4 is a sleeve H^2 , by means of which a reciprocating motion is imparted to the rod and valve in the rotation of the eccentric. The sleeve and the eccentric carried thereby are loosely fitted upon the engine-shaft and rotated by the gear carried by the governor-shaft, the eccentric being retained in proper position by the governor. As the speed of the engine increases the governor will be rotated, thereby throwing the eccentric ahead and cutting off the ports of the governing-valve before the piston reaches the end of its stroke. It will be apparent that by adjusting this eccentric to different positions with the sleeve it can be geared so as to travel the desired extent relative to the action of the governor and accurately control the operation of the governor-valve.

The modified form of sleeve shown in Fig. 4 is provided with a slot G^8 , in which a pin G^9 from the crank-shaft A^4 extends. At one end of the sleeve a flanged way G^{10} is provided, into which one arm of a crank-shaft G^{11} extends, while the other arm thereof is pivotally connected to the rod F^4 . By this construction when the sleeve G^7 is rotated through the movement of the governor-arm it is also given a longitudinal movement upon the crank-shaft, thus shifting the governing-valve E through the crank-arm G^{11} and valve-rod F^4 . The operation of the governing mechanism is the same as in Fig. 1, and the only difference in structure is in the transmission of power from the sleeve G^7 .

The governor herein shown is of the inertia type, being pivoted eccentrically to the axis of the fly-wheel and rotating therewith, it being held in position by the spring until the speed of the engine becomes greater than the set of the governor-spring. The spring then lacks power to hold the governor and the latter begins to hang back, thus rotating its shaft

and through the gears and sleeve, which is loose to rotate upon its shaft, shifts the eccentric for operating the governing-valve. The diagonal slot-and-pin connection between the sleeve and shaft causes the former to have a lateral movement upon the shaft and in so doing move the crank-arm connections for shifting the governing-valve.

It will be obvious that changes may be made in the details of construction and configuration without departing from the spirit of the invention as defined by the appended claims.

Having described my invention and set forth its merits, what I claim, and desire to secure by Letters Patent, is—

1. In a speed-governing mechanism, a shaft, a fly-wheel mounted upon said shaft and provided with a bearing eccentric thereto, a governor mechanism having weighted ends at opposite sides of said shaft and pivotally mounted in said bearing, a spring extended from the end of the governor opposite the pivot to said wheel, a driving-pinion carried by said governor-pivot, a sleeve rotatably mounted upon said shaft and provided with a gear meshing directly with said pinion, and means carried by said sleeve for transmitting motion to a reciprocating valve-rod; substantially as specified.

2. In a speed-governing mechanism, a shaft, a fly-wheel mounted upon said shaft and provided with a bearing eccentric thereto, a governor mechanism pivotally mounted in said bearing and provided with a driving-pinion upon its pivot, a sleeve rotatably mounted upon said shaft and provided with a gear meshing directly with said pinion, a spring connecting the free end of said governor mechanism to said fly-wheel, a governing-valve, a connecting-rod extending from said valve to said sleeve, and a tension device for controlling the pressure necessary to operate the governing-valve; substantially as specified.

3. In a speed-governing mechanism, a cylinder, a piston therein, a shaft connected to said piston, a fly-wheel mounted upon said shaft, a bearing carried by said wheel, a governor having weighted ends and rotatably mounted between its ends in said bearing eccentrically to the axis of said shaft, a spring connecting the free end of said governor-arm to said wheel, a diagonally-slotted sleeve rotatably and slidably mounted upon said shaft and having gear-teeth thereon, a pinion upon the pivot of said governor-arms directly geared to said sleeve, a governing-valve having an extended stem, and a crank-arm connected to said sleeve and stem; substantially as specified.

4. In a speed-governing mechanism, a driving-shaft, a fly-wheel upon said shaft provided with a bearing-block extended from its hub, a governing mechanism pivotally mounted in said block eccentrically to the axis of said wheel, a pinion upon the opposite end of

the governor-pivot, a rotatable sleeve mounted upon said shaft, gear-teeth carried by said sleeve to mesh directly with said pinion driven from said governing mechanism, and a valve-rod connected to said sleeve to be reciprocated thereby for actuating a governing-valve; substantially as specified.

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

LEOPOLD F. BURGER.

Witnesses:

EDWARD D. REARDON,
H. H. BENEFIEL.