

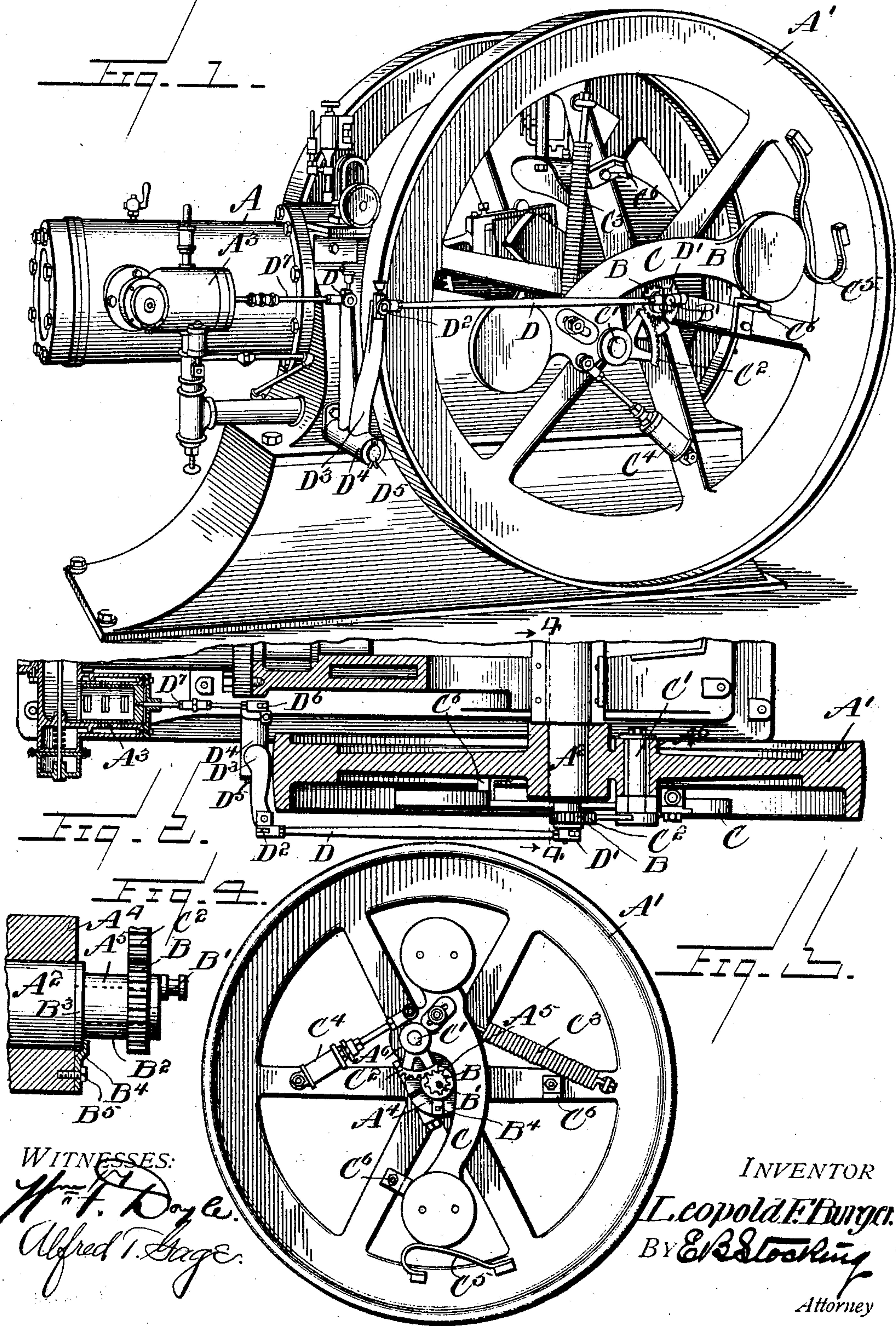
No. 771,459.

PATENTED OCT. 4, 1904.

L. F. BURGER.
SPEED GOVERNOR.

APPLICATION FILED NOV. 14, 1903.

NO MODEL.



WITNESSES:

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SPEED-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 771,459, dated October 4, 1904.

Application filed November 14, 1903. Serial No. 181,217. (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-Governors, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to a speed-governor, and particularly to a structure adapted for application with an eccentrically-mounted governor-weight.

The invention has for an object to provide a construction embodying a pinion mounted on the end of the shaft of a fly-wheel and adapted to be driven by a gearing mounted upon the movable governor-weight to transmit motion to a governing-valve with the minimum of friction, so as to promptly respond to changes in the load upon the engine and avoid the difficulties incident to the adjustment of eccentric-straps.

A further object of the invention is to provide a construction which is lighter in weight, simpler in construction, and consequently less expensive in installation and maintenance than that heretofore used in the art and the structure specifically shown in my prior patent, No. 725,669, dated April 21, 1903, on which the present invention is an improvement.

Other and further objects and advantages of the invention will be hereinafter set forth and the novel features thereof defined by the appended claims.

In the drawings, Figure 1 is a perspective of the invention applied to an engine. Fig. 2 is a central horizontal section through a portion thereof. Fig. 3 is a side elevation of a fly-wheel with the governor applied, and Fig. 4 is a detail vertical section on the line 4-4 of Fig. 2.

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

The letter A designates an explosive gas-engine, which may have any desired construction, that herein shown in the application of the invention being more fully disclosed in my prior patent, No. 725,669, dated

April 21, 1903. This structure of engine is provided with the usual balance or fly wheels A' and crank-shaft A², upon which they are mounted, while adjacent to the cylinder of the engine the governing-valve A³ of any desired construction is provided. The hub A⁴ of the fly-wheel A' is secured to the crank-shaft A² in any desired manner, while upon the free end A⁵ of this shaft a rotatable pinion B is mounted and provided with a crank or wrist pin B' upon its outer face. This pinion may be mounted in any desired manner; but a preferable construction is herein shown where the sleeve or cap B² is mounted upon the reduced end A⁵ of the crank-shaft and carries upon its periphery the pinion B and upon its end the wrist-pin B', while the inner end of this cap is provided with a flange B³ to abut against a shoulder formed at the base of the reduced portion A⁵, and the cap is held against longitudinal movement upon the end of the crank-shaft by means of the plate B⁴, secured to the hub A⁴ of the wheel by any desired means—for instance, the screw shown at B⁵. This permits a free rotation of the cap, pinion, and wrist-pin upon the end of the shaft. For the purpose of actuating this pinion a governor-weight C is mounted in a bearing A⁶ in the fly-wheel by the shaft C', which bearing is eccentric to the axis of the wheel, and the movable governor-weight has also secured thereto a segmental gear C², adapted to mesh with the pinion B upon the end of the shaft and to rotate said pinion in the movement of the governor-weight. Various forms of governor-weight may be provided; but that herein shown has been found very desirable and comprises a combined centrifugal and inertia weight of the ordinary character. The weight has connected thereto in the usual manner a tension-spring C³ and a dash-pot C⁴, while one of the weights is adapted in its travel to engage a friction-spring C⁵, carried adjacent to the rim of the wheel, and also the stop-blocks C⁶, located upon the spokes thereof, which limit the movement of the weight, while the spring C⁵ prevents violent contact with one of the blocks.

Any desired means may be provided for transmitting motion from the wrist-pin to the

governing-valve, and a desirable form is here shown comprising a rod D, connected by a suitable clamp D' with the wrist-pin B' and at its opposite end pivotally connected at D² to the rock-arm D³, carried by a sleeve D⁴, which is pivotally mounted upon the pin or shaft D⁵, secured to the engine-casing. The sleeve D⁴ is also provided with a second rock-arm D⁶ in alinement with the governing-valve A³, and a valve-rod D⁷ is pivotally connected to the rock-arm D⁶ and at its opposite end secured to the governing-valve.

It will be obvious that the movement of the governor-weight will be directly transmitted by the segmental gear to the pinion mounted upon the end of the crank-shaft and the necessary movement for the valve transmitted by the eccentric wrist-pin carried by this pinion, whereby the valve-rod is reciprocated with a minimum of friction, thus insuring the most accurate operation, variable upon the slightest change in the load of the engine, which cannot be successfully secured in the use of the eccentric-straps or other mechanism where an extended frictional contact prevents accuracy of movement, which is necessary in an engine of this character. It will also be noted that the simplicity of construction prevents the friction frequently caused by the tightening of the eccentric-straps by engineers to take up lost motion, which straps are often improperly adjusted, so that an accurate governor control of the valve is prevented. A further advantage of the construction is the small cost of construction and maintenance, while an attractive appearance is imparted to the engine.

Another object of the invention is to dispose the pinion and segmental gear in such position that they are readily accessible for the purpose of change or repair and in instances where it is found desirable to change the diameter thereof for the purpose of differently controlling the governor-valve of the engine. This cannot be secured in the constructions where the governor is mounted between the engine and fly-wheel.

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. The governor has been herein shown as mounted upon a fly-wheel; but it may be mounted upon any desired form of support carried by the crank-shaft.

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

1. In a speed-governor, a crank-shaft provided with means for supporting a governor, a governor pivotally mounted on said supporting means, a pinion rotatably mounted upon the outer free end of said crank-shaft beyond the governor-support, a driving-gear mounted to rotate with the said governor and

meshing with said pinion, and means actuated by said pinion for transmitting motion to the valve-rod.

2. In a speed-governor, a crank-shaft provided with means for supporting a governor, a governor pivotally mounted on said supporting means, a pinion rotatably mounted upon the outer end of said crank-shaft beyond the governor-support, a driving-gear mounted to rotate with said governor and meshing with said pinion, an eccentrically-mounted pin carried by said pinion, and a valve-rod pivotally connected to said pin.

3. In a speed-governor, a crank-shaft provided with means for supporting a governor, a governor pivotally mounted on said supporting means, a pinion rotatably mounted upon the outer end of said crank-shaft, a driving-gear mounted to rotate with said governor and meshing with said pinion, an eccentrically-mounted pin carried by said pinion, a valve-rod pivotally connected to said pin, a rock-sleeve provided with vertical arms thereon and rotatably mounted upon a fixed part, a pivotal connection between one of said arms and said valve-rod, and a connection from the other of said arms to a reciprocating valve.

4. In a speed-governor, the combination with a crank-shaft, of a fly-wheel mounted thereon and provided with a bearing eccentric thereto, a governor-weight pivotally mounted on said bearing, a sleeve pivotally mounted upon the free end of said crank-shaft, a pinion carried by said sleeve and provided with an eccentrically-disposed wrist-pin, a segmental gear carried by the governor-weight at its bearing and meshing with said pinion, and a valve-rod extending from said wrist-pin.

5. In a speed-governor, the combination with a crank-shaft, of a fly-wheel mounted thereon and provided with a bearing eccentric thereto, a governor-weight pivotally mounted in said bearing, a sleeve pivotally mounted upon the free end of said crank-shaft, a pinion carried by said sleeve and provided with an eccentrically-disposed wrist-pin, a segmental gear carried by the governor-weight at its bearing and meshing with said pinion, a valve-rod extending from said wrist-pin, a tension-spring at one side of said governor-weight, a dash-pot at the opposite side thereof, stop-lugs carried by the fly-wheel to limit the travel of said weight, and a friction-spring adapted to contact with one end of said weight before it engages one of said lugs.

6. In a speed-governor, the combination with a crank-shaft, of a fly-wheel mounted thereon and provided with a bearing eccentric thereto, a governor-weight pivotally mounted in said bearing, a sleeve pivotally mounted upon the free end of said crank-shaft, a pinion carried by said sleeve and provided with an eccentrically-disposed wrist-pin, a segmental gear carried by the governor-weight at its bearing and meshing with said pinion, a valve-

rod extending from said wrist-pin, a tension-spring at one side of said governor-weight, a dash-pot at the opposite side thereof, stop-lugs carried by the fly-wheel to limit the travel of said weight, a friction-spring adapted to contact with one end of said weight before it engages one of said lugs, a pivoting-pin mounted upon a fixed part, a rock-sleeve disposed on said pin and provided with vertical arms, one of which is connected to said valve-rod, and a connection between the other arm and the governing-valve.

7. In a speed-governor, the combination with a crank-shaft, of a fly-wheel mounted thereon and provided with a bearing eccentric thereto, a governor-weight pivotally mounted in said bearing, a sleeve pivotally mounted upon the free end of said crank-shaft, a pinion carried by said sleeve and provided with an eccentrically-disposed wrist-pin, a segmental gear carried by the governor-weight at its bearing and meshing with said pinion, a valve-rod extending from said wrist-pin, a tension-spring at one side of said governor-weight, a dash-pot at the opposite side thereof, stop-lugs carried by the fly-wheel to limit the travel of said weight, a friction-spring adapted to contact with one end of said weight before it engages one of said lugs, a pivoting-pin mounted upon a fixed part, a rock-sleeve disposed on said pin and provided with vertical arms, one of which is connected to said valve-rod, a connection between the other arm and the governing-valve, a flange at the inner end of said pinion-sleeve, and a holding-plate carried by the hub of the fly-wheel to embrace said flange.

8. In a speed-governor, a crank-shaft, a sleeve adapted to be rotatably mounted upon the free end of the crank-shaft and provided with a pinion upon its periphery, a pivoted governor-weight supported from the crank-shaft, a gear carried by a pivotally-mounted governor-weight to engage said pinion, and a wrist-pin carried by said sleeve and pinion eccentric to said crank-shaft.

9. In a speed-governor, a crank-shaft, a sleeve adapted to be rotatably mounted upon

the free end of the crank-shaft and provided with a pinion upon its periphery, a pivoted governor-weight, a gear carried by the pivotally-mounted governor-weight to engage said pinion, a wrist-pin carried by said sleeve and pinion eccentric to said crank-shaft, a flange upon the inner end of said sleeve, and a holding-plate overlapping said flange and carried by a relatively movable part.

10. In a speed-governor, a crank-shaft, a sleeve adapted to be rotatably mounted upon the free end of the crank-shaft and provided with a pinion upon its periphery, a pivoted governor-weight, a gear carried by the pivotally-mounted governor-weight to engage said pinion, a wrist-pin carried by said sleeve and pinion eccentric to said crank-shaft, a rotatable sleeve provided with rock-arms, one of which is deflected laterally to the other, a rod connecting one of said rock-arms with said wrist-pin, and a connection between the other rock-arm and the governing-valve.

11. In a governing mechanism, a crank-shaft provided with means for supporting a governor, a governor member mounted upon said supporting means, valve-controlling means mounted to rotate upon the axis of said crank-shaft beyond the governor-support, means for operatively connecting said controlling means with the governor, and a connection extending from said controlling means to a valve.

12. In a governing mechanism, a crank-shaft provided with means for supporting a governor, a governor mounted upon said supporting means, an eccentrically-disposed wrist-pin rotatably mounted upon the outer free end of said crank-shaft upon the governor-support, means extending from the governor to rotate said wrist-pin upon the shaft, and a connection extending from said wrist-pin to a valve.

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

LEOPOLD F. BURGER.

Witnesses:

W. J. WOOLLEY,
C. E. CHEESMAN.