

No. 768,158.

PATENTED AUG. 23, 1904.

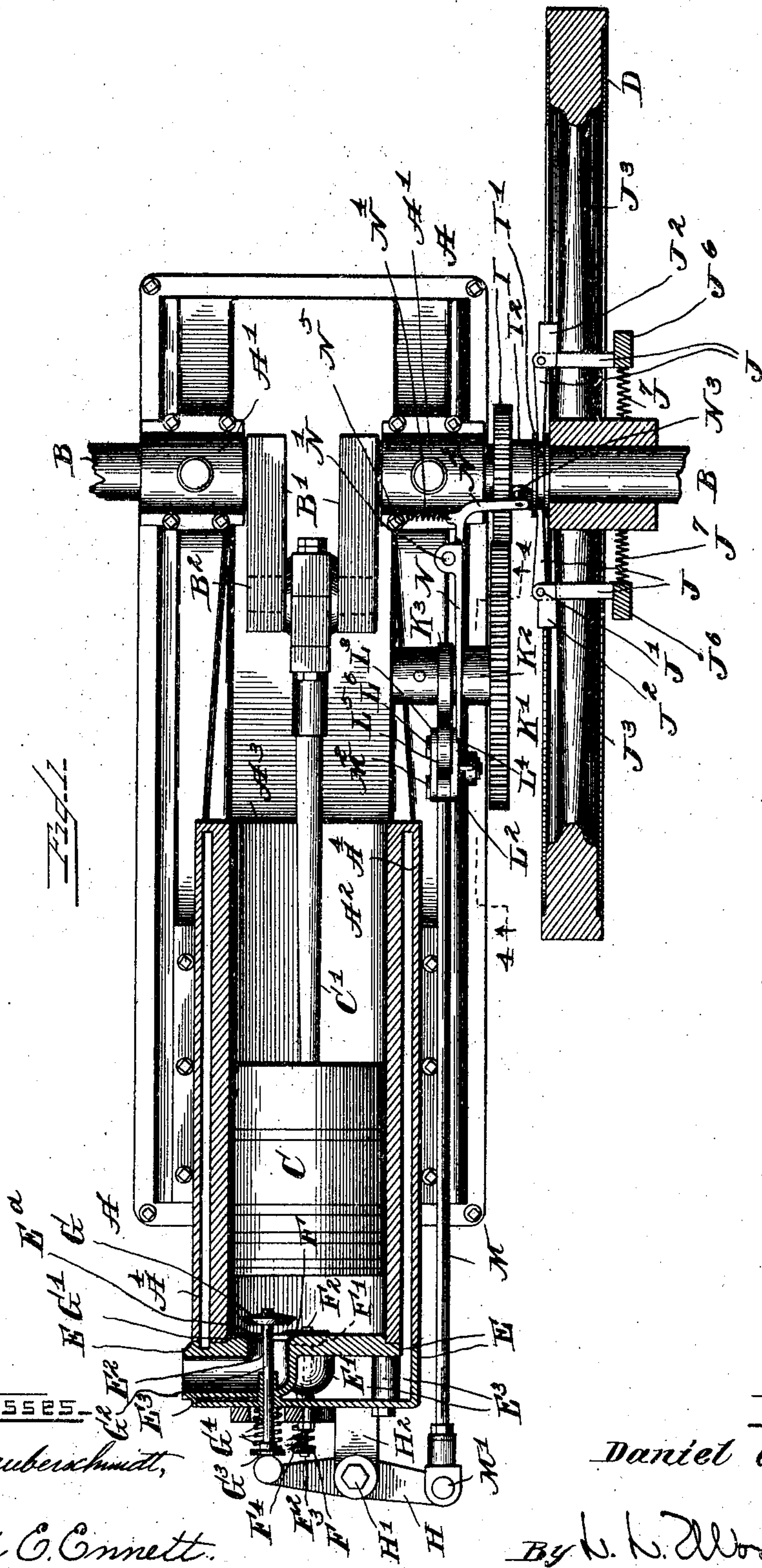
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GOVERNOR FOR GASOLINE ENGINES.

APPLICATION FILED MAR. 22, 1904.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES

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GOVERNOR FOR GASOLENE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 768,158, dated August 23, 1904.

Application filed March 22, 1904. Serial No. 199,474. (No model.)

To all whom it may concern:

Be it known that I, DANIEL C. STOVER, a citizen of the United States of America, residing at Freeport, in the county of Stephenson and State of Illinois, have invented certain new and useful Improvements in Governors for Gasolene-Engines, of which the following is a specification.

The object of my invention is to provide mechanism for rendering as nearly uniform as practicable the speed of gasolene-engines; and it consists of certain new and useful features of construction and combinations of parts especially devised to that end, all as hereinafter fully described, and specifically pointed out in the claims.

Referring to the accompanying drawings, which form a part of this specification, Figure 1 is a top plan view of a gasolene-engine provided with my improvements and having parts thereof sectioned away to better show the construction and arrangement of interior parts of the same. Fig. 2 is an enlarged detail view of parts shown in Fig. 1, some whereof are in different positions and relations from those shown in the last-mentioned figure. Fig. 3 is a section at the dotted line 3 in Fig. 2 of parts there shown. Fig. 4 is a section at the dotted line 4 in Fig. 1 of parts there shown.

Like letters of reference indicate corresponding parts throughout the several views.

A, Fig. 1, is the main frame of an engine, which has opposite bearings A' therein, to support a main shaft, and a cylinder A², (shown in central longitudinal section,) open at one end A³ and surrounded by a water-jacket A⁴.

B is a main shaft, having the central portion thereof bent to form a double crank B' and connecting-wrist B² and mounted in bearings A' in the main frame A.

C is a piston adapted to slide in the cylinder A².

C' is a pitman pivot-jointed by one end to the piston C and by the other end to the crank B'.

D is a balance-wheel fast to the main shaft B. A driving-pulley (not shown) is also mounted fast on the shaft B.

E is a circular cylinder-head having a mixing-chamber E', an exhaust-chamber E², pro-

vided with an exhaust-valve opening E^a, and a water-chamber E³, formed therein, and serves to tightly close the outer end of the cylinder A².

F is a valve adapted to fit into the valve-seat F', and thereby close the mixing-chamber E'. The valve F is provided with a stem F², projecting therefrom out through the cylinder-head E and terminating in a disk F³, fast thereto. A compressed spring F⁴ is included between the cylinder-head E and the disk F³ and serves to hold the valve F normally closed.

G is a valve adapted to fit into the valve-seat G', and thereby close the valve-opening E^a in the exhaust-chamber E². The valve G is provided with a stem G², projecting therefrom inward through the cylinder-head E and terminating in a disk G³, fast thereto. A compressed spring G⁴ is included between the cylinder-head E and disk G³ and serves to hold the valve G normally closed.

H is a lever mounted, by means of a pivot H', on the horizontal lug H², integral with the outside of the head E and contacting with its free end the outer end of the stem of the exhaust-valve G.

I is a governor-gear, having a peripheral groove I' in the hub I² thereof, and is splined upon the main shaft B, so as to be freely slidable thereon.

J represents bell-cranks pivotally mounted at their angles on bearings J', supported by lugs J², fast to spokes J³ of the balance-wheel D. The inner arms J⁴ of the bell-cranks J project into engagement with the groove I' in the hub I² of the gear I, and their outer arms J⁵ have governing-weights J⁶ secured to their free ends. Powerful tension-springs J⁷, acting through the bell-cranks J, normally maintain the gear I in the position shown in Fig. 2.

K is a non-rotatable stub-shaft projecting transversely from the frame A.

K' is a gear-wheel meshing with the governor-gear I and rotatably mounted, by means of the hub K², on the stub-shaft K.

K³ is a cam fast to the free end of the hub K² of the gear-wheel K'.

L is a rocking arm mounted at its lower end on a pivot-bearing L' on the main frame A and provided at its upper end with extended horizontal jaws L² L³ to provide for the

admission and mounting of parts to be described hereinafter and having a locking-recess L^4 , Figs. 1 and 2, therein.

L^5 is a roller mounted between the jaws L^2 L^3 of the arm L on the bearing L^6 and having its periphery contacting the periphery of the cam K^3 .

M is a connecting-rod jointed, by means of the pivot M' , to the outer end of the lever H and by means of the pivot M^2 between the jaws L^2 L^3 of the arm L .

N is a detent mounted on a stationary pivot-bearing N' and adapted to be swung thereon alternately into and out of engagement with the locking-recess L^4 in the upper end of the rocking arm L and provided with a transversely-extending rigid arm N^2 , carrying a roller N^3 , contacting the outer face of the governor-gear I by reason of the action of the tension-spring N^4 connecting such arm with a fixed bearing N^5 on the machine-frame.

The spring G^4 , Fig. 1, maintains the roller L^5 in constant engagement with the cam-roller K^3 and normally acts to keep the valve G closed in contact with its seat G' .

Inasmuch as my invention only relates to governors for gasoline-engines, I have purposely refrained from showing any of the mechanism thereof which was not necessary to an understanding of such invention.

Suppose an admixture of air and gasoline-vapor is being drawn at intervals by suction through the opening of the valve F and from the mixing-chamber E' into the closed end of the cylinder A^2 , where it is ignited in the usual manner, the impulse of each successive explosion of such mixture acting upon the piston C will reciprocate it with increasing rapidity until the speed of the engine exceeds a predetermined rate. As a result thereof centrifugal force will swing the governing-weights J^6 apart from the positions shown in Fig. 2 to those shown in Fig. 1 and acting through the bell-cranks J slide the sleeve I^2 and governor-gear I outward and there-through swing the free end of the detent N from the position shown in Figs. 2 and 3 to that shown in Figs. 1 and 4 into engagement with the locking-recess L^4 in the arm L . Simultaneously with the engagement of the detent N with the locking-recess L^4 in the arm L the apex of the cam O of the cam-roller K^3 , acting upon the roller L^5 and through the connecting-rod M , lever H , and cam-stem G^2 and against the spring G^4 , opens and holds open the valve G of the exhaust-valve opening E^a until the speed of the engine falls below a predetermined rate, when centripetal force will swing the governing-weights J^6 from the positions shown in Fig. 1 to that shown in Fig. 2, with the result that the detent N will have been disengaged from its locking-recess L^4 in the arm L , the cam-roller K^3 will have turned from the position shown in Fig. 4 to that shown in Fig. 3, and the spring G^4 , Fig.

1, will have closed the valve G against its seat G' . Immediately thereafter commingled air and gasoline-vapor will again be drawn at intervals through the opening of the valve F by suction from the mixing-chamber E' into the closed end of the cylinder A^2 , where it will be ignited and communicate the impulses of its successive explosions to the piston C until the speed of the engine again exceeds the predetermined rate, which will then be again diminished in the manner and to the extent already hereinbefore indicated.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a governor for gasoline-engines, in combination, a supporting-frame, a main shaft mounted therein, a governor-gear, splined on the main shaft to move endwise thereon and having a peripheral groove in the hub thereof, a balance-wheel fast to the main shaft, two bell-cranks pivotally mounted, at their angles, on bearings supported by the balance-wheel, and having their inner arms projecting into engagement with the groove in the hub of the governor-gear, and their outer arms provided with governing-weights secured to their free ends, a gear-wheel, meshing with the governor-gear and mounted on a bearing on the main frame, a cam carried by the hub of the gear-wheel, a rocking arm mounted, at its lower end, on a pivot-bearing on the main frame and provided, at its upper end, with jaws and having a locking-recess therein, a roller mounted between the jaws of the locking-arm and having its periphery contacting the cam on the hub of the gear-wheel, means for maintaining the roller in engagement with the cam, a detent, mounted on a stationary pivot-bearing and adapted to be swung thereon alternately into and out of engagement with the locking-recess in the rocking arm, and provided with an arm carrying a roller contacting the outer face of the governor-gear and means for maintaining such roller in contact with such governor-gear, substantially as described.

2. In a governor for gasoline-engines, in combination, a main frame, a cylinder supported thereby and having an exhaust-valve opening in the head thereof, an exhaust-valve, for closing such opening therein, provided with a transverse stem, a spring encircling the valve-stem and normally acting to close such valve, a piston slidable in the cylinder, a main shaft provided with a crank, a rod connecting the piston with the crank of such main shaft, a governor-gear, splined on the main shaft to move endwise thereon and having a peripheral groove in the hub thereof, a balance-wheel fast to the main shaft, two bell-cranks pivotally mounted, at their angles, on bearings supported by the balance-wheel, and having their inner arms projecting into engagement with the groove in the hub of the governor-gear, and their outer arms provided with

governing-weights secured to their free ends,
a gear-wheel, meshing with the governor-gear
and mounted on a bearing on the main frame,
a cam carried by the hub of the gear-wheel,
5 a rocking arm mounted, at its lower end, on
a pivot-bearing on the main frame and pro-
vided, at its upper end, with jaws and having
a locking-recess therein, a roller mounted be-
tween the jaws of the rocking arm and having
10 its periphery contacting the cam on the hub
of the gear-wheel, a pivotally-mounted lever
contacting with its free end the outer end of
the stem of the exhaust-valve, a rod pivotally
connecting its remaining end with a pivot-
15 bearing in the jaws of the rocking shaft, a
detent, mounted on a stationary pivot-bearing

and adapted to be swung thereon alternately
into and out of engagement with the locking-
recess in the rocking arm and provided with
a transversely-extending arm carrying a roller 20
contacting the outer face of the governor-
gear, and a spring maintaining such roller in
contact with the outer face of such governor-
gear, substantially as described.

In testimony whereof I have signed my name 25
to this specification in the presence of two sub-
scribing witnesses.

DANIEL C. STOVER.

Witnesses:

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W. C. PFENDER.