No. 883,727. PATENTED APR. 7, 1908.

C. I. LONGENECKER.

SPEED CONTROLLING DEVICE.

APPLICATION FILED MAY 2, 1907.

2 SHEETS—SHEET 1.

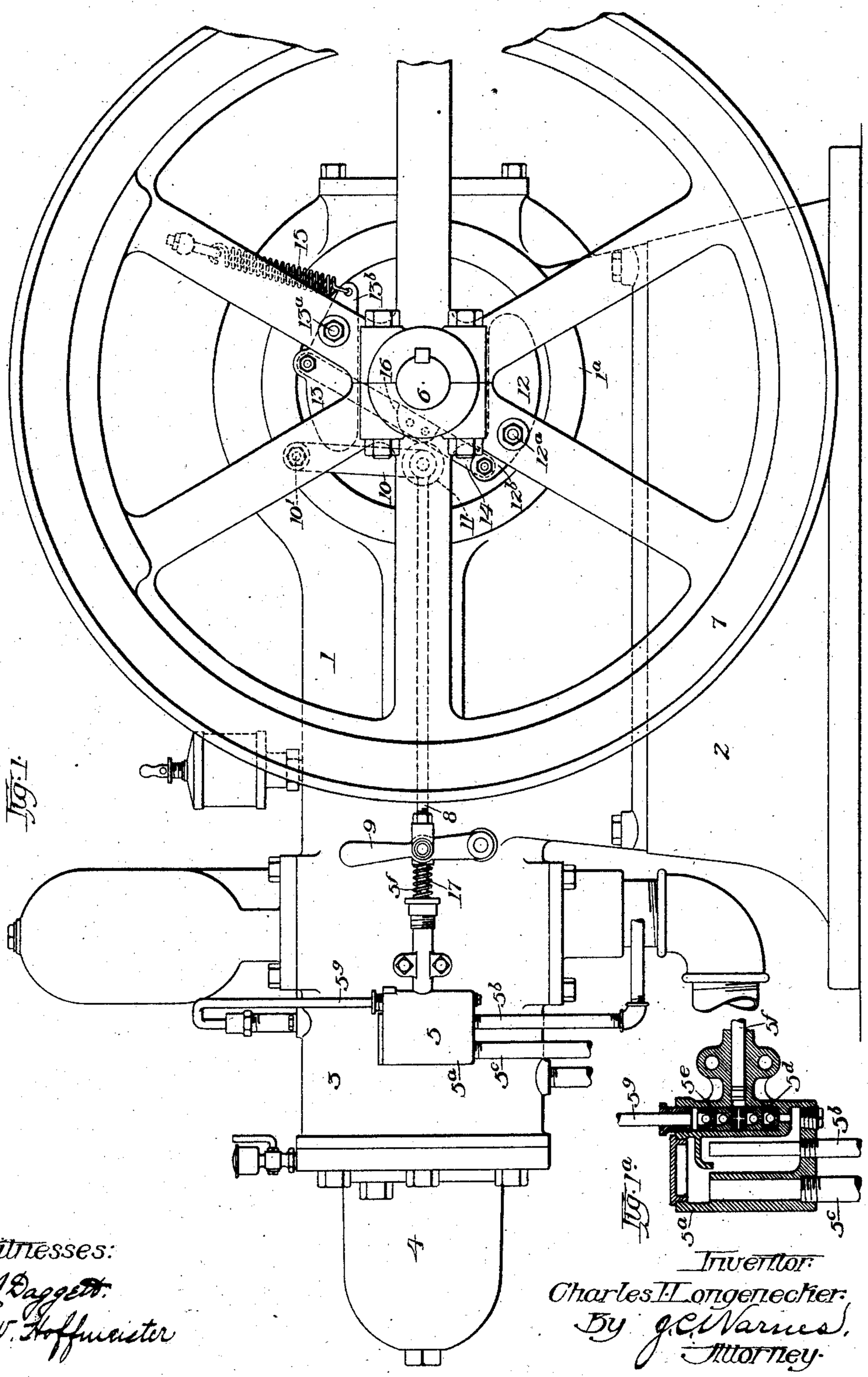

Fig. 1.

Fig. 1a.

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2 SHEETS—SHEET 2.

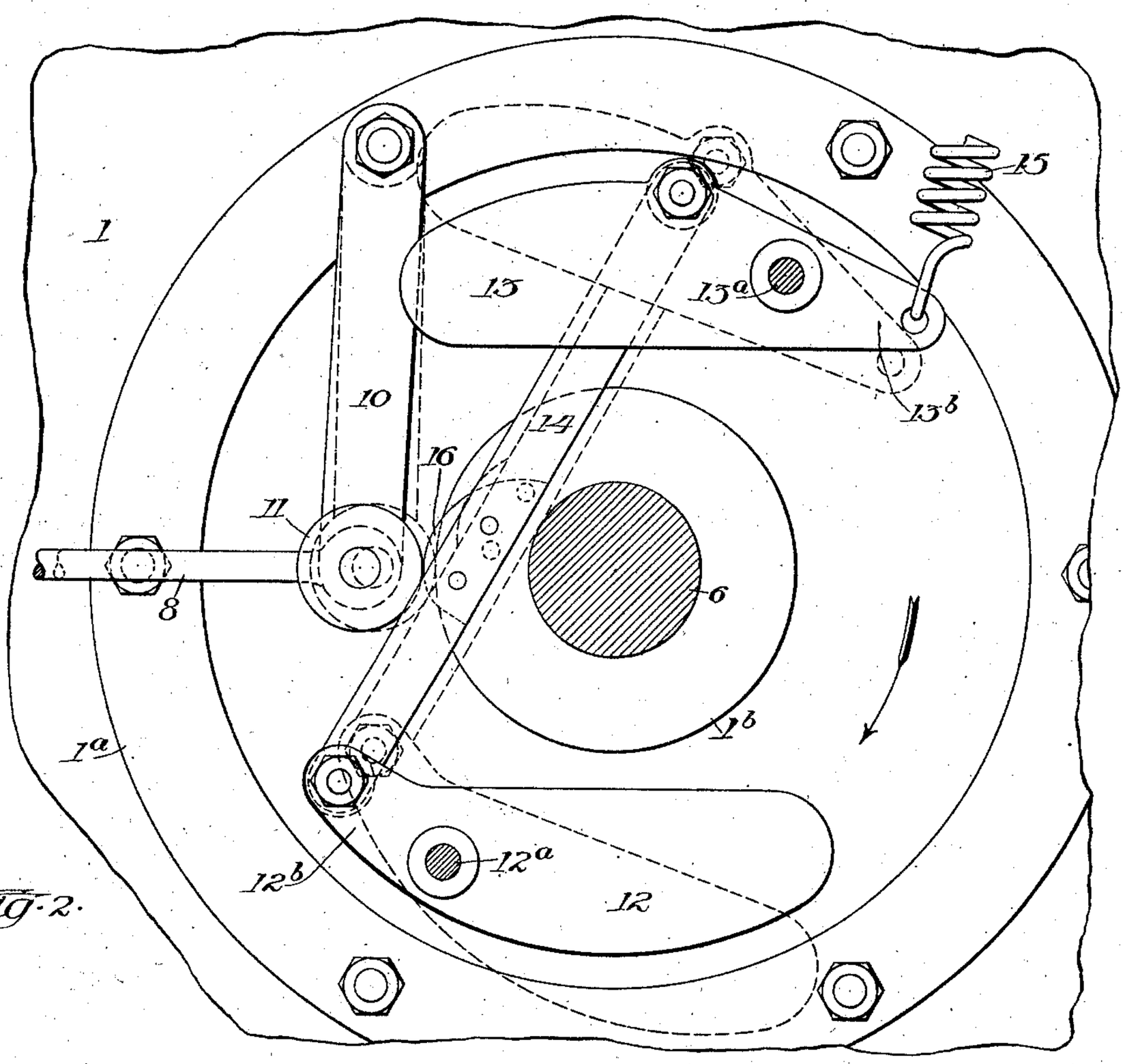
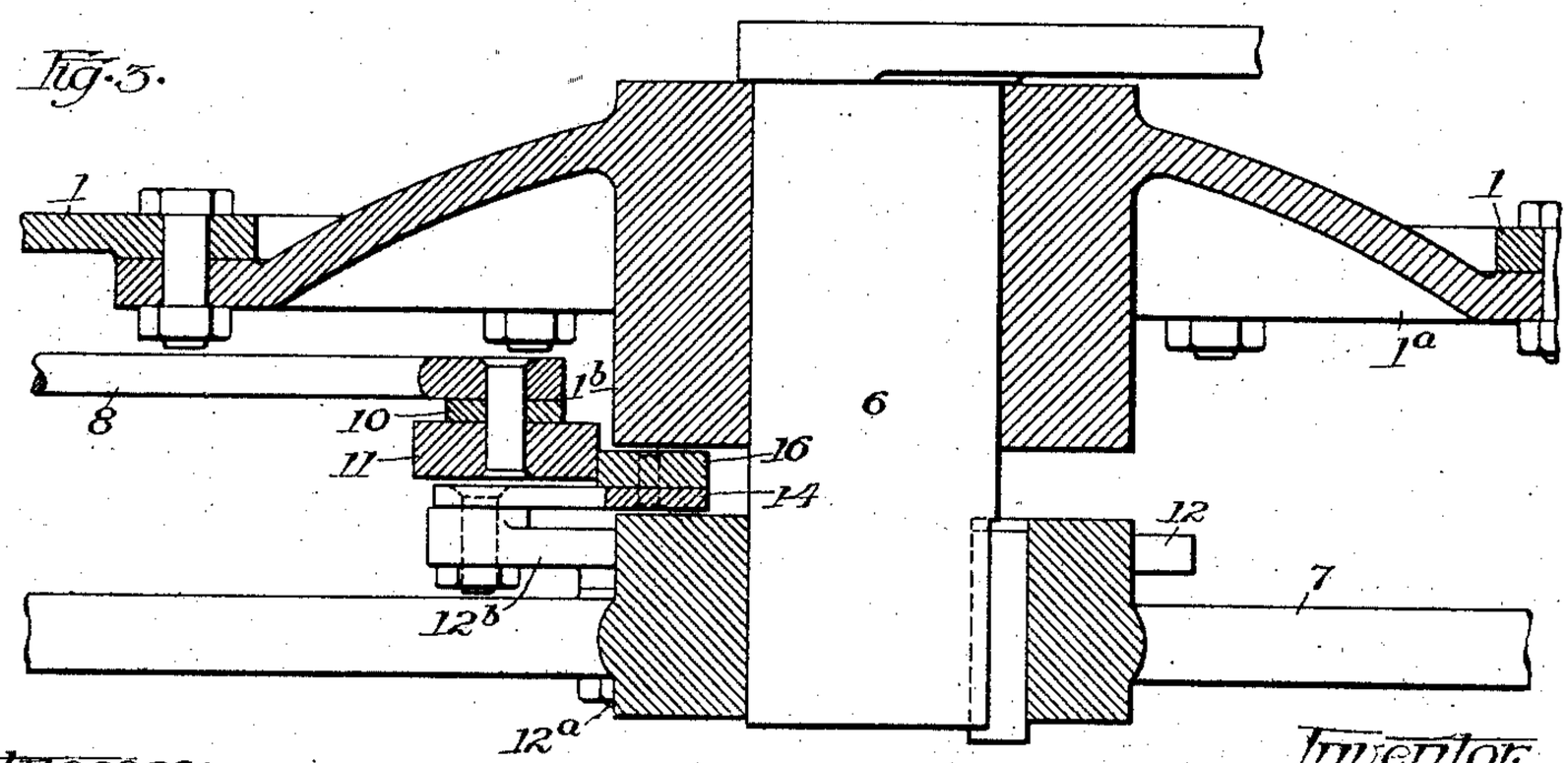


Fig. 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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SPEED-CONTROLLING DEVICE.

No. 883,727. Specification of Letters Patent. Patented April 7, 1908.

Application filed May 2, 1907. Serial No. 371,388.

To all whom it may concern:

Be it known that I, CHARLES I. LONGENECKER, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in a Speed-Controlling Device for Gas-Engines, of which the following is a complete specification.

This invention relates to the speed governing mechanism for internal combustion engines and, as herein illustrated, is shown as being applied to an oil engine to effect and regulate the supply of fuel to the cylinder.

The object in view is to produce a simple and effective governor construction free from the usual cams or sliding members.

Referring to the accompanying drawing—Figure 1 represents a side elevation of an oil engine in which is embodied my invention. Fig. 1[a] is a detail section showing the oil injecting pump. Fig. 2 is a detail side elevation with the fly wheel removed in order to more clearly show the governor weights, connecting link and associated parts; and Fig. 3 is a fragmentary central plan section through the parts shown in the preceding figure, with the hub of the fly wheel in place.

In the drawings the frame of the engine is designated by the numeral 1, and the base on which it rests by 2, the engine shown being of the two cycle type operated on low gravity oils, such as kerosene.

3 designates the cylinder, 4 the ignition chamber, 5 the fuel injecting pump, 6 the crank shaft, and 7 the fly wheel secured thereto.

The above mentioned parts need not be described in detail, as they constitute no part of the present invention. The parts of the pump 5, however, may be briefly pointed out. This pump consists of the constant level cup 5[a], the supply pipe 5[b], the overflow pipe 5[c], the lower valves 5[d], the upper valves 5[e], the plunger 5[f], and the supply pipe leading to the cylinder 5[g], these parts collectively constituting the means for controlling the admission of fuel to the cylinder. The plunger 5[f] is actuated by the reciprocating pump rod 8, at the junction of which with said plunger is mounted the rocking hand lever 9 for operating the injector pump independently of the mechanically operating means. The forward end of the pump rod 8 is supported by the swinging arm 10, which is pivoted to the frame 1 at 10[1], and on the forward end of said rod is mounted the roller 11. This arm 10 and the rod 8 constitute means actuated by the governor mechanism and operatively connecting with the fuel admission mechanism for controlling and operating said mechanism.

The governor mechanism, in which the novel features of this invention reside, consists in the weights 12 and 13, which are pivotally mounted at 12[a] and 13[a], respectively, on the fly wheel 7, or other suitable rotating member of the engine. These weights 12 and 13 are oppositely disposed on the fly wheel, and are provided with short arms 12[b] and 13[b], respectively. A link 14 connects the weights 12 and 13, the said link connecting with the short arm 12[b] of the former, and with the weight 13 at a point thereon approximately at a distance equal to the length of the short arm 12[b], but opposite from the arm 13[b].

Assuming the crank shaft 6 and fly wheel thereon to be rotating in the direction of the arrow in Fig. 2, it will be seen that the pivotal connection of the link 14 with the weight 12 is rotatively in advance of the pivotal point 12[a] of the said weight 12, while the connection of said link with the weight 13 is rotatively in the rear of the pivotal point 13[a] of this weight. The spring 15, which extends between the short arm 13[b] and a fixed point on the fly wheel 7, operates to hold the weights 12 and 13 toward the center of the crank shaft 6. The result of such arrangement will be that as the weights are moved radially and outwardly by centrifugal force and against the action of the spring 15 from the full to the dotted line positions shown in Fig. 2, the link 14 will be caused to move not only longitudinally but also radially toward the crank shaft. To the said link, intermediate of its length, is fixed a cam projection 16, which consists of a semi-circular disk, its convex side projecting outwardly as shown and the radius of curvature being greater on its approaching than on its receding side in order to avoid a sudden shock on the pump rod. The endwise and transverse movement of the link 14 will in effect produce a radial movement of this cam projection, which is arranged to contact the roller 11 and, when the engine is not above normal speed, will impart a reciprocating motion to the pump rod 8, work-

ing the plunger 5^f and injecting oil into the cylinder 3. As long as the engine is running at normal speed, or below, the cam projection 16 will contact the roller 11 each revolution and operate and control by its variable positions the admission of fuel in a manner well understood. When above speed, however, the weights 12 and 13 moving outwardly will cause the cam 16 to move inwardly to the position indicated by dotted lines in Fig. 2, in which position said cam projects just enough into the path of the roller to slightly engage and actuate same. When the cam projection occupies this position the roller 11 will be pushed toward the crank shaft 6 by the spring 17 which surrounds the projecting end of the plunger 5^f, and in this position the said roller will rest idly on the sleeve 1^b of the side plate 1^a, or if desired may be made to rest upon an inwardly projecting sleeve upon the fly wheel hub. This side plate 1^a is securely bolted to the side of the frame 1, and one end of the crank shaft 6 journals therein. In this manner the governor weights, through the cam projection 16 on the link 14, directly operate and control the mechanism which admits fuel to the cylinder. It is evident, of course, that the reciprocating rod 8 might be made to control and operate the admission of a gaseous fuel equally as well as a liquid fuel.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a centrifugal governor, in combination, a rotating member, governor weights pivotally mounted thereon, a link connecting said weights, and a cam projection fixed to said link intermediate its length, substantially as described.

2. In a centrifugal governor, in combination, a rotating member, governor weights pivotally mounted thereon, a link connecting said weights, and a cam projection formed of a semi-circular disk, said disk fixed to said link at a position intermediate of its length, the arrangement being such that an outward movement of said weights will produce a movement inwardly of said cam projection, substantially as described.

3. In a centrifugal governor, in combination, a rotating member, governor weights pivotally mounted thereon, a link connecting said weights, and a cam projection formed of a semi-circular disk, the radius of curvature thereof being greater on its approaching than its receding side, the said disk being fixed to said link at a position intermediate of its length, substantially as described.

CHARLES I. LONGENECKER.

Witnesses:
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