

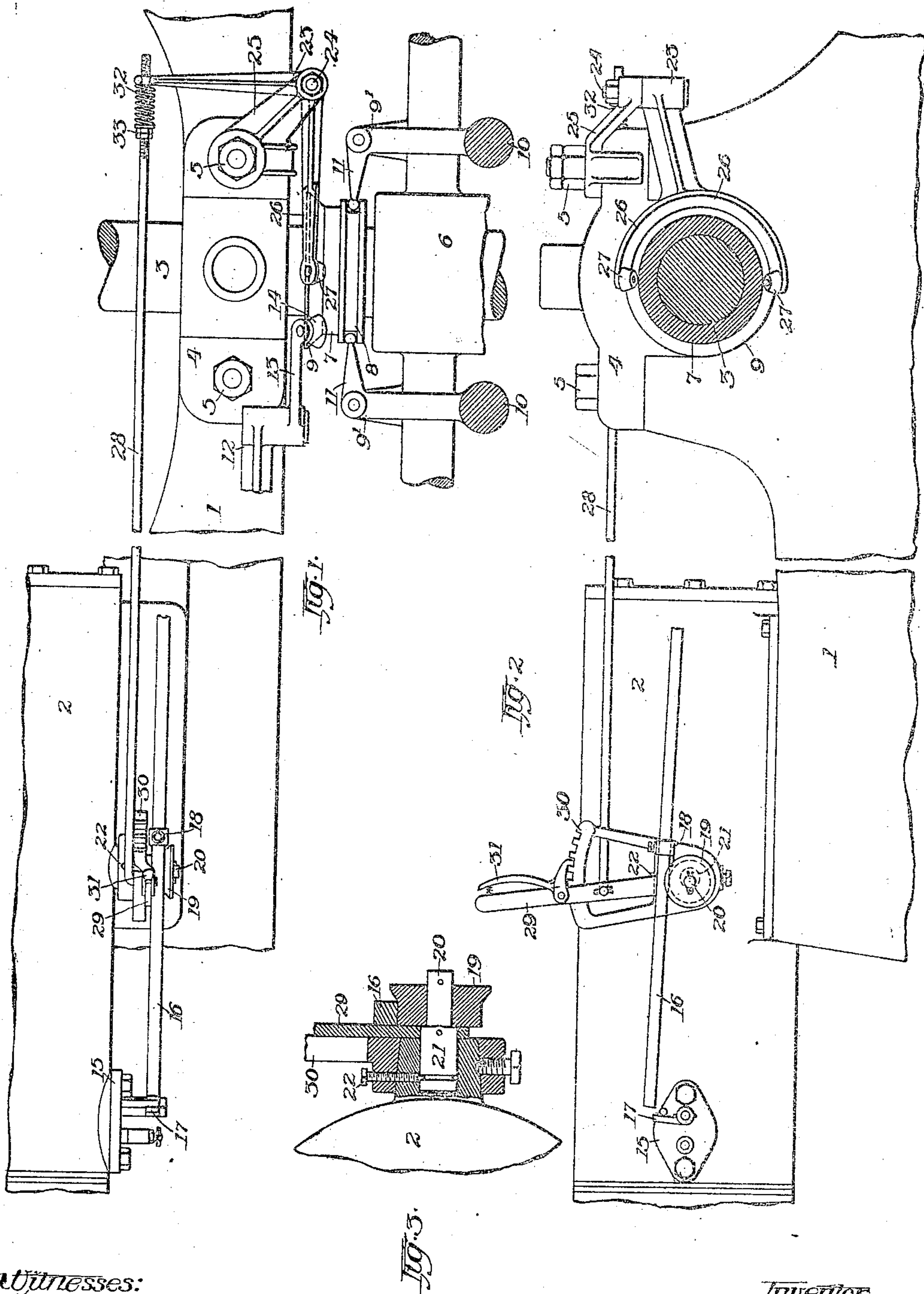
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C. I. LONGENECKER.

GAS ENGINE.

APPLICATION FILED MAY 13, 1907.



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GAS-ENGINE.

No. 862,568.

Specification of Letters Patent.

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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 certain new and useful Improvements in Gas-Engines, of which the following is a specification.

My invention relates to speed changing mechanism for explosive engines in which the mechanism for controlling the time of ignition of the explosive charge is regulated by the same means that regulates the speed of the engine; its object being to provide a device of the above character that will be both simple and serviceable, and one that may be readily attached to the engine. I attain these objects by the mechanism illustrated in the accompanying drawing, in which—

Figure 1 is a top plan view of my improvement and a part of the engine structure sufficient to illustrate the application of my invention thereto. Fig. 2 is a side elevation of Fig. 1; and Fig. 3 is a sectional detached detail of a part of the speed controlling mechanism.

Like reference numerals designate similar parts throughout the several views.

1 represents the bed of the engine; 2 the cylinder secured thereto; 3 the engine shaft having one end journaled in a bearing formed in the bed and cap 4, secured to the bed by means of bolts 5. 6 represents the hub of the fly wheel secured to the engine shaft; 7 is a sleeve slidably mounted upon said shaft and having a peripheral channel 8 at its outer end and a conical flange 9 at its opposite end. 9^a represents lever arms pivotally mounted upon the fly wheel, and having weighted outer ends 10, and inner arms 11 adapted to engage with the channel 8 in a manner to control the movement of the sleeve longitudinally upon the shaft. The arms 9 may be connected by means of springs. 12 represents a hit and miss lever pivotally connected with the engine bed and having a rearwardly extending arm 13, provided with a contact roller 14 engaging with the conical flange 9. The forwardly extending arm of the lever, being broken away, is designed to contact with a valve operating rod in a wellknown way to prevent admission of explosive mixture to the engine. 15 represents a plug secured to the cylinder and in which the sparking electrodes are mounted, and 16 represents a reciprocating igniter rod designed to have its rear end connected to a moving part of the engine, and its forward end to make and break contact with a lever 17 mounted on the movable electrode, the duration of contact of the rod with the lever being regulated by means of an adjustable shoe 18 mounted on the rod and adapted to contact with a roller 19, upon which the rod rests, the roller being journaled upon an eccentric extension of a stud 21, rotatably mounted upon a fixed part of

the engine and adapted, when turned, to adjust the roller relative to the rod and shoe; the stud being held against endwise movement by means of a set screw 22 engaging with a groove therein. All of the above mentioned parts are common in engines of the class described and are only used in combination with other devices essential to my invention and which I will now describe.

A bell crank lever 23 is pivotally mounted upon the engine bed in rear of the crank shaft by means of a pivot bolt 24 secured to a bracket 25, that is preferably held in place by one of the bolts 5 that secures the cap 4 to the engine bed. One arm of the lever is provided with fork arms 26 that embrace the sleeve 7, and 27 represent rollers rotatably mounted at the extremities of the fork arms and contacting with the conical flange 9 of said sleeve. The other arm of the bell crank lever extends inwardly substantially parallel with the engine shaft and is provided with an opening that receives loosely the rear end of a rod 28, that has its forward end pivotally connected with a hand lever 29 that is secured to the stud 21, and 30 is a common form of sector rack secured to the engine and adapted to secure the lever in adjusted position by means of the thumb latch 31, pivotally mounted upon the lever 29, and adapted to engage with the toothed portion of the rack in the well-known way. A coiled spring 32 surrounds the rear end of the rod 28 and is operative between adjusting nuts 33 on the rod and the arm of the bell crank lever in a manner to yieldingly press the rollers carried by the fork arms against the conical flange on the governor sleeve.

In operation the regular governor mechanism is regulated in the common way to allow a normal speed of the engine, and the spring 32 is inoperative when lever 29 is held in position with the thumb latch engaging with the farthest notch toward the left-hand in the rack, and the movement of the sleeve is not influenced by it. If it be desired to increase the speed of the engine the hand lever is adjusted toward the right, compressing spring 32 and causing it to press the rollers carried by the fork arm against the flange in a manner to supplement the regular force opposing the centrifugal action of the governor mechanism, and at the same time the eccentric pin carrying the roller 19 is rotated in a manner to adjust the roller to a higher plane and thus advance the time of ignition relative to the speed of the engine.

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

1. A gas engine having, in combination, speed governing mechanism, igniter mechanism, a reciprocating rod adapted to make and break contact with a part of said igniter mechanism, means for controlling the path of movement of said rod whereby the duration of the make and break contact is regulated, a yielding resistance op-

posing the action of said speed governing mechanism, and means for regulating the force of said resistance, said means being connected with said rod controlling means whereby both of said regulating means may be operated in unison.

2. A gas engine having, in combination, speed governing mechanism, igniter mechanism, a reciprocating rod adapted to make and break contact with a part of said igniter mechanism, means for controlling the path of movement of said rod whereby the duration of the make and break contact is regulated, said means comprising a stud pivotally mounted in a fixed part of the engine, said stud having a reduced journal portion eccentric to the axis of its pivot, a roller mounted on said journal portion and supporting said rod, a yielding resistance opposing the action of said speed governing mechanism, and means for regulating the force of said resistance, said means comprising a lever secured to said stud and connected with said resistance.

3. A gas engine having, in combination, igniter mechanism, a reciprocating rod adapted to make and break contact with a part of said igniter mechanism, means for controlling the path of movement of said rod whereby the duration of the make and break contact is regulated, a centrifugal governor adapted to control the speed of the engine and having a sliding sleeve forming a part thereof, a lever pivotally mounted upon a fixed part of the engine, having one end engaging with said sleeve in a manner to be moved in one direction thereby, a spring operative against the other arm of the lever to move it in an opposite direction, and means for regulating the force of said spring, said means being connected with said contact

regulating means whereby both of said regulating means may be operated in unison.

4. A gas engine having, in combination, igniter mechanism, a reciprocating rod adapted to make and break contact with a part of said igniter mechanism, means for controlling the path of movement of said rod whereby the duration of the make and break contact is regulated, said means comprising a stud pivotally mounted in a fixed part of the engine, said stud having a reduced journal portion eccentric to the axis of its pivot, a roller mounted on said journal portion and supporting said rod, an engine shaft, a fly wheel mounted thereon, a centrifugal governor adapted to control the speed of the engine and having weighted arms pivotally mounted upon said fly wheel, a sleeve slidably mounted upon said shaft and engaging said arms, a bell crank lever pivotally mounted upon a fixed part of the engine and having one arm engaging said sleeve in a manner to be moved in one direction thereby, and another arm having an opening therein, an adjusting lever secured to the stud forming part of the igniter regulating means, a rod having one end pivotally connected with said lever and its opposite end loosely received by the opening in said bell crank arm, a coiled spring surrounding the end of said rod and operative to oppose a movement of said arm, said adjusting lever being adapted to rotate said stud and regulate the force of said spring simultaneously.

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