G. A. BAUER.

MOTOR CONTROLLER.

APPLICATION FILED NOV. 19, 1908.

979,250.

Patented Dec. 20, 1910.

2 SHEETS—SHEET 1.

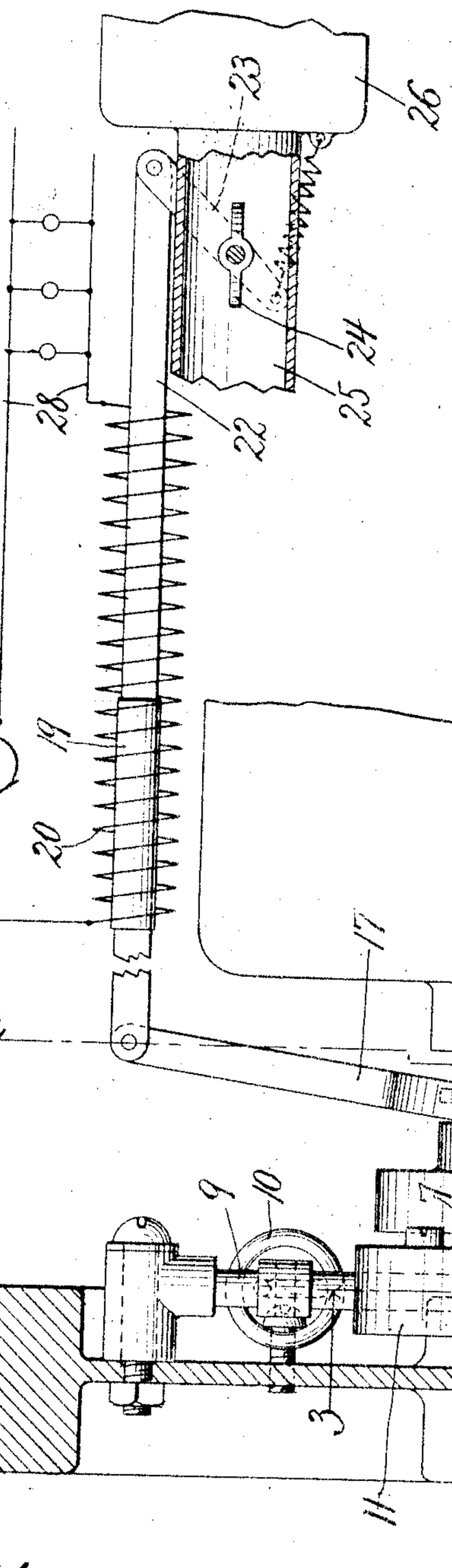

Fig. 1.

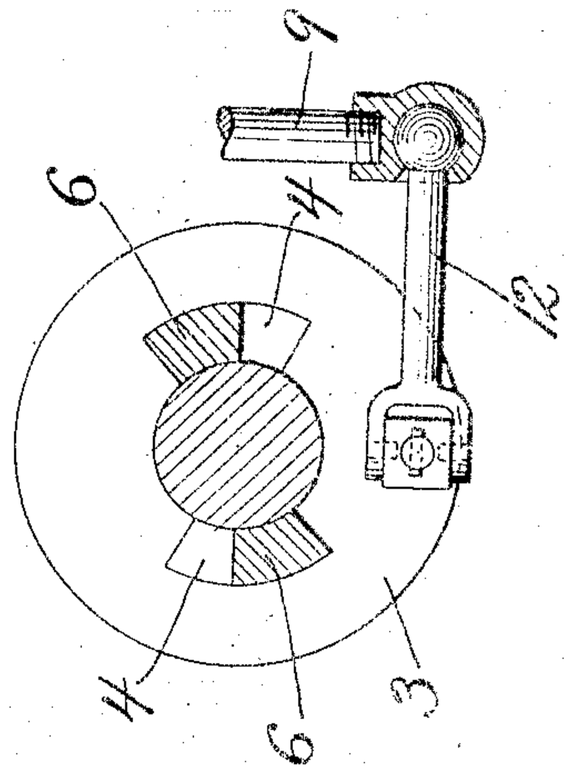

Fig. 3.

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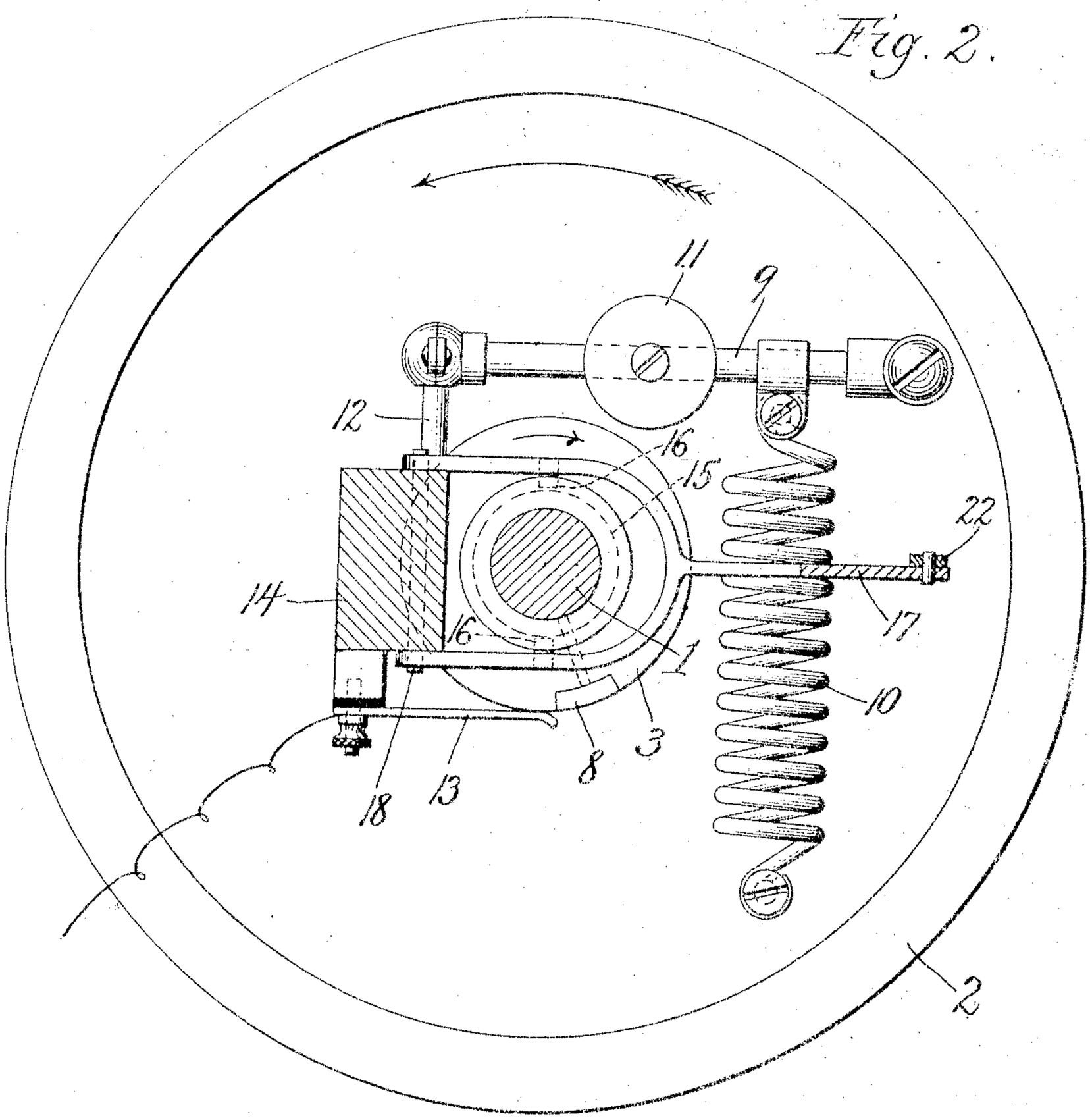
2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

GUSTAVUS A. BAUER, OF CHICAGO, ILLINOIS.

MOTOR-CONTROLLER.

979,250. Specification of Letters Patent. Patented Dec. 20, 1910.

Application filed November 19, 1908. Serial No. 463,357.

To all whom it may concern:

Be it known that I, GUSTAVUS A. BAUER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Motor-Controllers, of which the following is a specification.

This invention relates to controlling devices for gas, gasolene or other internal combustion engines, and has for its object to provide a new and improved device of this description.

The invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a view in part diagrammatic showing one form of construction embodying the invention; Fig. 2 is a sectional view taken on line 2—2 of Fig. 1; Fig. 3 is a sectional view taken on line 3—3 of Fig. 1.

Like numerals refer to like parts throughout the several figures.

I have shown the invention as applied to an engine having a constant speed and a variable load. The shaft 1 of the engine is provided with a fly-wheel 2. Mounted upon the shaft 1 is a disk 3 having a receiving recess 4 having the inclined face 5. A projection 6 is fastened to the hub or some other part of the fly-wheel, and is adapted to project more or less into this receiving recess, the distance varying with the conditions. This projection is also provided with a beveled or inclined face 7, which engages the beveled or inclined face 5 on the disk. This disk is provided with an electrical contact 8, which is insulated from the remaining portion of the disk in any desired manner, and which is connected in an electrical circuit preferably by being connected to the shaft 1 and thence to the frame of the machine as shown in Fig. 2.

The pivoted governor arm 9 is pivoted to the fly-wheel and is connected with a spring 10. There, of course, may be two of these arms as in the ordinary governor, but I have shown one in order to simplify the drawing. The arm 9 is provided with the adjustable weight 11, and is connected by a connecting piece 12 with the disk 3 (see Fig. 3), the connection being such that when the end of the arm 9 moves outwardly as the speed of the fly-wheel increases, the disk 3 will be rocked by the shaft 1 so as to change the position of the contact 8 with relation to the stationary sliding contact 13, which engages the periphery of the disk 3. This stationary contact is connected to the supporting piece 14.

The contacts 8 and 13 are connected in a circuit with the ignition system which ignites the material in the cylinder of the engine. As the disk 3 is rocked by the movement of the arms 9 and 12 in opposition to the spring 10, the contact 8 is moved so as to reach the contact 13 at a later period with relation to the revolution of the disk and the position of the piston. The hub of the disk 3 is provided with a groove 15 in which work the pins 16 fastened to the arm of the bifurcated lever 17 pivoted at 18 to the fixed part. The lever 17 is connected with the magnetic core 19 of the coil or solenoid 20, located in an electric circuit 28 supplied by the dynamo 21 operated by the engine. As illustrated, this circuit is shown as an incandescent light circuit where the load of the dynamo is continually varying, and where the speed of the dynamo must be kept substantially constant to supply the constant voltage necessary in such an electric system. The core 19 of magnetic material is connected by a piece 22 with the arm 23 which controls the valve 24 in the pipe 25 leading from the source of supply 26 of the power mixture to the cylinder of the engine, the quantity of the material supplied to the engine being controlled by moving this valve. The portion of the piece 22 which extends into the coil 20 is of non-magnetic material. A spring 27 is connected with the arm 23 tending to move it in opposition to the coil 20.

The use and operation of my invention are as follows:—When the engine is in operation, the disk 3 is rotated with the fly-wheel and the contacts 8 and 13 are brought together each revolution. These contacts are so positioned as to cause the spark in the cylinder to be produced at the desired point of the stroke. If now the speed of the engine increases above the desired constant speed, the disk 3 is rocked so as to move the contact 8 to a position where it engages the contact 13 later in each revolution. This causes an ignition of the material in the cylinder later in the stroke of the piston, that is, when the ignition does not occur until the piston comes near to the end of the stroke. This reduces the power of the engine and tends to bring the speed back to normal whereupon the arm 9 by means of the spring 10 is brought back and the disk

3 rocked to change the position of the spark back to that at which it occurs at normal speed. If, however, the engine is driving a variable load, such regulation is not sufficient, because when the load is increased the speed will decrease and vice versa, and I have shown means for preventing this condition. If, for example, the load increases the coil 20 moves the core 19 inwardly and rocks the valve 24 so as to open wider the passageway from the source of power supply to the cylinder of the engine, thus permitting more material to enter the cylinder and causing an increase of power. The parts are so regulated that the increase of material is properly proportioned to the increase of the load. The movement of the core 19 moves the lever 17 which moves the disk 3 away from the projection 6. The beveled face 5 on the disk and the face 7 on the projection cause the disk to be rocked to cause the spark to occur earlier, thus making it able to take care of the additional power fluid supply, and secure the proper increase in power. If the load is decreased, the current in the coil 20 is decreased, thus weakening the pull upon the core 19, and permitting it to move outwardly under the influence of the spring 27. This moves the valve 24 to shut off a portion of the supply of the power fluid, and decreases the power of the engine.

It will thus be seen that I have here a regulating device by means of which the speed of the engine may be kept constant although the load varies.

I claim:

1. A controlling device for internal combustion engines comprising a device for automatically controlling the point with relation to the piston of the engine at which the spark occurs responsive to variations in speed of the engine, and a device for automatically controlling the amount of material fed to the cylinder responsive to variation in the load of the engine.

2. A device for controlling internal combustion engines comprising a part connected with the engine shaft so as to be rotated thereby, an electrical contact associated with said part and connected with the circuit containing the spark coil, a stationary contact connected with the circuit containing the spark coil and adapted to be connected to and disconnected from said moving contact as said part rotates, two means for controlling the position of said part, one responsive to the speed of the engine, and the other responsive to the load of the engine.

3. A controlling device for internal combustion engines comprising means for varying the point in the stroke of the piston at which the spark in the cylinder of the engine is formed, and two devices for controlling said means, one responsive to the speed of the engine and the other responsive to the load of the engine.

4. A controlling device for internal combustion engines comprising means for varying the point in the stroke of the piston at which the spark in the cylinder of the engine is formed, two devices for controlling said means, one responsive to the speed of the engine and the other responsive to the load of the engine, and a connection between said latter device and the valve which controls material supplied to the engine.

5. A controlling device for internal combustion engines comprising a disk mounted upon a shaft driven by the engine and free to move longitudinally thereon, an electrical contact associated with said disk and connected in circuit with the spark coil of the engine, a coöperating contact also connected in circuit with the spark coil of the engine and adapted to make contact with the contact on the disk at each rotation of the disk, an inclined engaging face associated with said disk, an inclined engaging face connected with the shaft of the engine so as to rotate therewith and engage the inclined face on the disk, a controlling part connected with said disk and adapted to move it laterally so as to move said inclined engaging faces relatively and cause the disk to be rocked, said controlling part responsive to variations in the load of the engine.

6. A controlling device for internal combustion engines comprising a disk mounted upon a shaft driven by the engine and free to move longitudinally thereon, an electrical contact associated with said disk and connected in circuit with the spark coil of the engine, a coöperating contact also connected in circuit with the spark coil of the engine and adapted to make contact with the contact on the disk at each rotation of the disk, an inclined engaging face associated with said disk, an inclined engaging face connected with the shaft of the engine so as to rotate therewith and engage the inclined face on the disk, a controlling part connected with said disk and adapted to move it laterally so as to move said inclined engaging faces relatively and cause the disk to be rocked, said controlling part responsive to variations in the load of the engine, and means responsive to the speed of the engine for rocking said disk.

7. A controlling device for internal combustion engines comprising a disk mounted upon a shaft driven by the engine and free to move longitudinally thereon, an electrical contact associated with said disk and connected in circuit with the spark coil of the engine, a coöperating contact also connected in circuit with the spark coil of the engine and adapted to make contact with the contact on the disk at each rotation of the disk, an inclined engaging face associated with

said disk, an inclined engaging face connected with the shaft of the engine so as to rotate therewith and engage the inclined face on the disk, a controlling part connected with said disk and adapted to move it laterally so as to move said inclined engaging faces relatively and cause the disk to be rocked, said controlling part responsive to variations in the load of the engine, said controlling part connected, so as to control the valve between the supply of power fluid and the cylinder of the engine.

8. A controlling device for internal combustion engines comprising a disk mounted upon a shaft driven by the engine and free to move longitudinally thereon, an electrical contact associated with said disk and connected in circuit with the spark coil of the engine, a coöperating contact also connected in circuit with the spark coil of the engine and adapted to make contact with the contact on the disk at each rotation of the disk, an inclined engaging face associated with said disk, an inclined engaging face connected with the shaft of the engine so as to rotate therewith and engage the inclined face on the disk, a controlling part connected with said disk and adapted to move it laterally so as to move said inclined engaging faces relatively and cause the disk to be rocked, said controlling part responsive to variations in the load of the engine, a pivoted arm rotating with the shaft and having a weight associated therewith, a counteracting spring connected with said arm, and a connection between said arm and said disk whereby the disk is rocked in response to variations in the speed of the engine.

9. A controlling device for internal combustion engines, comprising a device for automatically varying the position of the spark with relation to the piston of the engine, said device directly responsive to variation in the load and the speed.

10. A controlling device for internal combustion engines, comprising a device for automatically varying the position of the spark with relation to the piston of the engine, said device directly responsive to variation in the load and fuel supply.

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Witnesses:

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