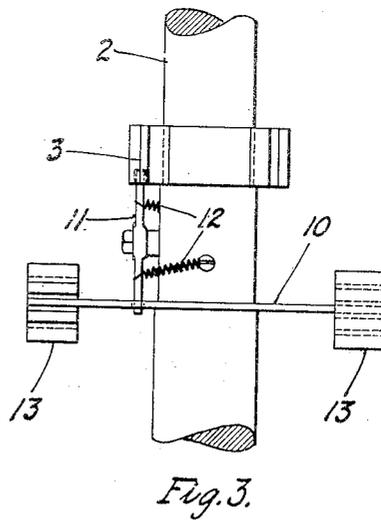
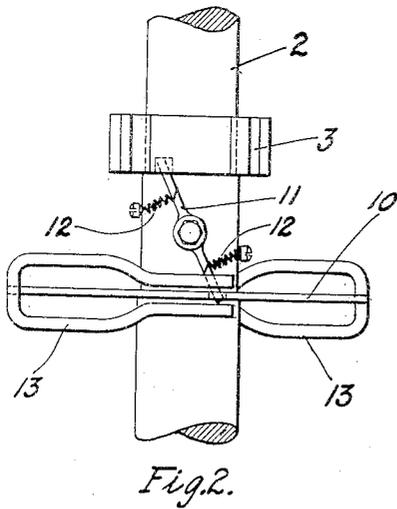
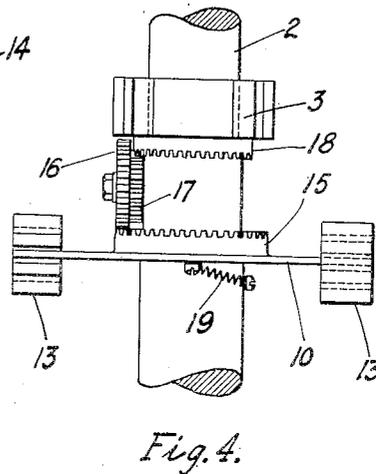
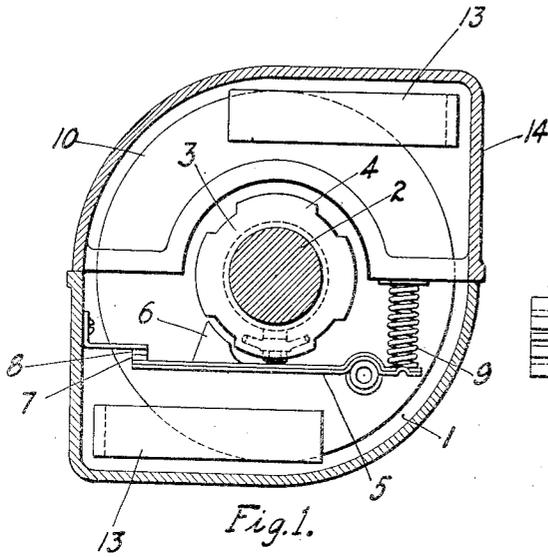


H. V. S. TAYLOR.
 IGNITION MECHANISM.
 APPLICATION FILED DEC. 4, 1914.

1,219,680.

Patented Mar. 20, 1917.



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IGNITION MECHANISM.

1,219,680.

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To all whom it may concern:

Be it known that I, HORACE V. S. TAYLOR, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Ignition Mechanisms, of which the following is a specification.

My invention relates to ignition mechanism and particularly to automatic means for controlling the timing of ignition sparks that are produced in the cylinders of internal-combustion engines.

My invention has for its object to provide a simple and efficient means for automatically adjusting ignition devices of an internal-combustion engine in accordance with the engine speed.

It has been proposed heretofore to automatically control such devices by means of centrifugally actuated mechanisms that are operatively connected to the engine shaft. Such arrangements involve the use of weighted members that revolve at high speeds, and a complicated structure is necessary to produce an effect that is approximately proportional to the engine speed.

According to my invention, the spark is advanced in accordance with the increase in engine speed. A disk, which is connected to the usual interrupter cam is controlled by stationary permanent magnets. The movement of the disk causes eddy currents to be set up, and the rotative movement of the disk is retarded by a force which is proportional to its speed. The position of the cam relatively to its actuating shaft is thereby adjusted in accordance with the engine speed.

The details of my invention will be described in connection with the accompanying drawings, in which Figure 1 is an end view, partially in elevation and partially in section, of a mechanism constructed in accordance with my invention. Fig. 2 is a side view, in elevation, of the mechanism of Fig. 1. Fig. 3 is a view similar to Fig. 2 but taken at right angles thereto. Fig. 4 is a view, in side elevation, of a modification.

Referring to Figs. 1, 2 and 3, an ignition mechanism 1 comprises a rotatable shaft 2 which may be operatively connected to the engine shaft in any suitable manner (not shown). An interrupter cam 3 of the usual type, which is rotatably mounted on the

shaft 2, is provided with projections 4 which correspond in number to the cylinders of the engine in connection with which it may be employed. A pivoted lever 5 carries, at an intermediate portion, a projecting member 6 which coacts with the projections 4 of the cam disk 3. The lever 5 carries, at its outer end, a contact member 7 which coacts with a stationary contact member 8 to control the production of ignition sparks in the usual and well known manner. A spring 9 normally retains the lever 5 in its illustrated position to maintain the engagement of the contact members 7 and 8.

A circular disk 10 of suitable conducting material, which is rotatably mounted on the shaft 2, is connected to the interrupter cam 3 by means of a pivoted lever 11. The relative angular positions of the interrupter cam 3 and the disk 10 are normally maintained by springs 12 which tend to retain the lever 11 in its illustrated position. A pair of stationary permanent magnets 13, or drag magnets, which are secured in any suitable manner to a casing 14, are located on diametrically opposite sides of the shaft 2 and adjacent to the periphery of the disk 10.

When the shaft 2 is rotated, the projections 4 of the disk 3 coact with the projecting members 6 to actuate the lever 5 and thereby separate the contact members 7 and 8. The rotation of the disk 10 relatively to the stationary magnets 13 causes eddy currents to be set up in the disk. The result is to produce a retarding force which is proportional to the speed of the disk 10, since the eddy currents are proportional to its speed.

As the speed of the shaft 2 increases, the retarding force exerted by the magnets 13 increases and the lever 11 is actuated against the tension of the springs 12 to permit a rotation of the disk 10 backward relatively to the shaft 2 and at the same time, to produce a corresponding forward movement of the disk 3. The disk 3 will, therefore, be advanced relatively to the shaft 2 and cause the separation of the contact members 7 and 8 to occur at a period earlier in the stroke of the engine piston.

When the speed of the shaft 2 decreases, the force exerted upon the disk 10 by the magnets 13 is correspondingly decreased and the springs 12 actuate the lever 11 to

return the interrupter cam 3 backwardly relatively to the shaft 2 toward its normal position. The position of the interrupter cam 3 is thus varied in accordance with the speed of the shaft 2 to cause the separation of the contact members 7 and 8 earlier or later in the stroke of the engine piston, according as the speed of the engine increases or decreases.

Reference may now be had to Fig. 4 in which similar numerals are employed to designate corresponding parts. The disk 10 is connected to the interrupter cam 3 by means of a train of gear mechanism comprising four gear wheels 15, 16, 17 and 18. The operation of the modified form of my invention differs in no material respect from that described in connection with Figs. 1, 2 and 3 except that, by varying the relative lengths of the diameters of the gear wheels 16 and 17; a movement of the gear wheel 15 may be made to cause a greater or less movement of the gear wheel 18.

I claim as my invention:

1. In an ignition device, the combination with an interrupter, an actuating member and a rotatable shaft for carrying said member, of electro-responsive means for causing said member to be advanced or retarded relatively to said shaft in accordance with an increase or a decrease in the speed of said shaft.

2. In an ignition device, the combination with a movable member, and means comprising a rotatable shaft and a loosely mounted member thereon for actuating said member, of electro-responsive means for causing said loosely mounted member to be advanced or retarded relatively to said shaft according as the speed of said shaft is increased or decreased.

3. In an ignition device, the combination with a movable member, a cam member co-acting therewith, and a rotatable element for actuating said cam member, of electro-responsive means for advancing or retarding said cam member relatively to said rotatable element to a degree corresponding to an increase or a decrease in the speed of said element.

4. In an ignition device, the combination with an interrupter mechanism comprising relatively movable contact members and a cam, and a shaft for rotatably supporting

said cam, of electro-responsive means for varying the angular position of said cam relatively to said shaft in accordance with the speed of said shaft.

5. In an ignition device, the combination with an interrupter mechanism comprising a cam, and a shaft for rotatably supporting said cam, of an element rotatably mounted on said shaft, and means whereby a retardation of rotative movement of said element produces an angular advance of said cam, relatively to said shaft.

6. In an ignition device, the combination with an interrupter mechanism comprising a cam, and a shaft for rotatably supporting said cam, of an element rotatably mounted on said shaft and operatively connected to said cam, and means for retarding rotative movement of said element by a force that is proportional to the speed of said shaft.

7. In an ignition device, the combination with an interrupter mechanism comprising a cam, and a shaft for rotatably supporting said cam, of an element rotatably mounted on said shaft and operatively connected to said cam, and stationary magnets for retarding rotative movement of said element by a force that is proportional to the speed of said shaft.

8. In an ignition device, the combination with an interrupter mechanism comprising a cam, and a shaft for rotatably supporting said cam, of a disk rotatably mounted on said shaft and operatively connected to said cam, and drag magnets adjacent to said disk for retarding rotative movement of said disk.

9. In an ignition device, the combination with an interrupter mechanism comprising a cam, and a shaft for rotatably supporting said cam, of a disk rotatably mounted on said shaft and operatively connected to said cam, and drag magnets adjacent to said disk for retarding rotative movement of said disk, and means for yieldingly retaining said cam and said disk in one position relatively to said shaft.

In testimony whereof, I have hereunto subscribed my name this 28th day of November 1914.

HORACE V. S. TAYLOR.

Witnesses:

W. L. WRIGHT,
B. B. HINES.