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GOVERNING MEANS FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JULY 30, 1910.

1,202,463. Patented Oct. 24, 1916.

2 SHEETS—SHEET 1.

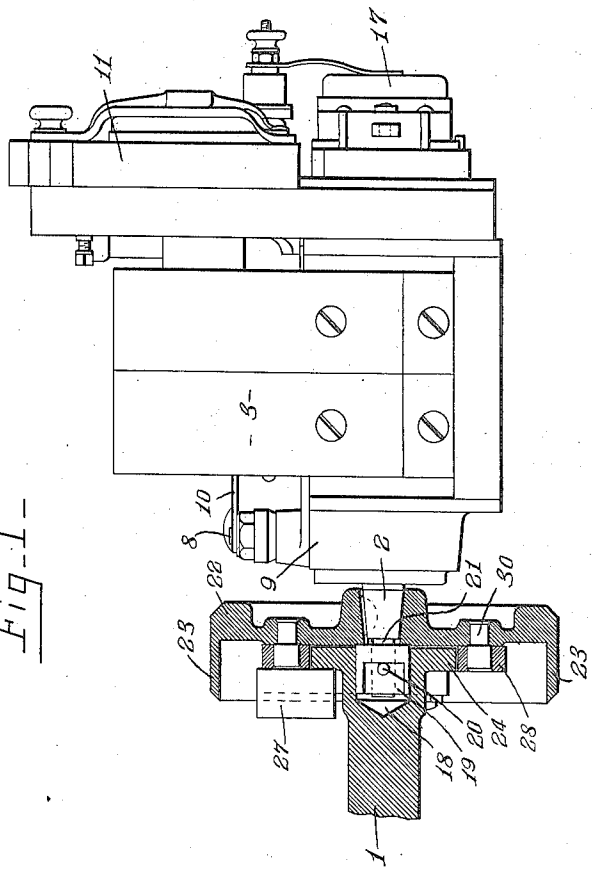


Fig. 1.

WITNESSES:

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S. Davis.

INVENTOR

John Wilkinson

BY

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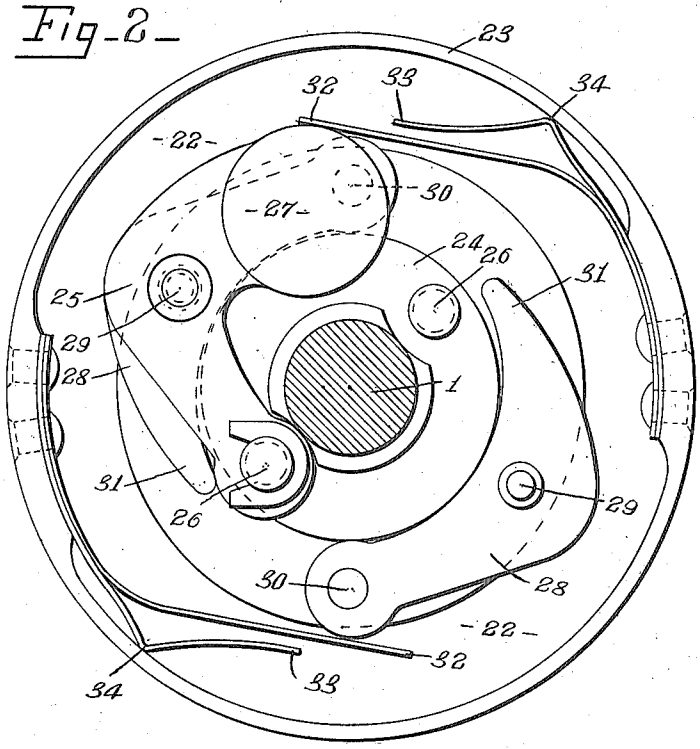
GOVERNING MEANS FOR INTERNAL COMBUSTION ENGINES.

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2 SHEETS—SHEET 2.

Fig-2-



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UNITED STATES PATENT OFFICE.

JOHN WILKINSON, OF SYRACUSE, NEW YORK, ASSIGNOR TO H. H. FRANKLIN MANUFACTURING COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

GOVERNING MEANS FOR INTERNAL-COMBUSTION ENGINES.

1,202,463. Specification of Letters Patent. Patented Oct. 24, 1916.

Application filed July 30, 1910. Serial No. 574,629.

To all whom it may concern:

Be it known that I, JOHN WILKINSON, of Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Governing Means for Internal-Combustion Engines, of which the following is a specification.

My invention has for its object the production of a particularly simple and efficient ignition governing means for internal combustion engines; and it consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawing in which like characters designate corresponding parts in all the views.

Figure 1 is an elevation, partly in section, of one embodiment of my invention. Fig. 2 is an end elevation of parts seen in Fig. 1, parts being omitted.

This ignition governing means for internal combustion engines comprises a driving element, a driven element, a source of electric energy, as a magneto having the usual rotating part and a non-rotating part, one of which parts is shiftable relatively to the other to change the time of the breaking of the circuit at said terminals, a centrifugal member movable with the driving element, and connections between said member and the shiftable part of the make-and-break device of the magneto for transmitting the movement of said member to the shiftable part of said device.

1 is the driving element as a shaft; 2 is the driven element, usually arranged in axial alinement with the driving shaft. The driving shaft is usually actuated by the crank shaft of the engine with which my invention is associated, and the driven shaft is the armature of the magneto 3.

By shifting either the armature shaft 2 or the part or ring of the magneto carrying the fixed contacts through which current is distributed from the movable contact or wiper, the time of the separation of the terminals of the make-and-break device of the magneto may be varied with respect to the positions of the pistons in the engine from which the magneto shaft is driven. Heretofore the part or ring carrying the fixed contacts of the timer of the magneto, to which contacts the current is distributed by the wiper on the magneto shaft has been shifted by hand but in this invention the shiftable part, which in this embodiment of my invention is the magneto shaft 2, is shiftable automatically a part of a revolution. The construction of the magneto and parts associated therewith forms no part of my invention and the magneto may be dispensed with and any other source of electric energy employed, and any other form of make-and-break device or timer may be used. The end of the armature shaft carrying the terminals of the make-and-break device and the timer construction are inclosed by a cap 17 (Fig. 1).

One of the shafts as the driving shaft 1, Fig. 1, is usually formed with an axial socket 18 for receiving a nut 19 turning on, and locked by a pin 20, to a threaded extension 21 of the driven shaft 2, the nut fitting the socket and thereby serving to hold the shafts 1 and 2 in axial alinement.

22 is a rotatable member or balance wheel mounted on and keyed to the end of the driven shaft 2 abutting against the driving shaft, the balance wheel being formed with a circular flange 23 overhanging the driving shaft 1. As here shown the driving shaft 1 is formed with an annular flange 24 one side of which abuts against the balance wheel 22.

The driven shaft 2 is shifted about its axis or advanced a part of a revolution relatively to the driving shaft as the speed of the driving shaft 1 increases in order to shift the lever 13 relatively to the cams 16, such advance being effected by means including the balance wheel 22 and a centrifugal member comprising an angular lever 25 pivoted at one end at 26 to the flange 24 of the driving shaft 1 near the axis thereof, and having a weight 27 at its opposite end and being pivotally connected intermediate of its ends to the wheel 22 in order to transmit its movement due to the centrifugal action of the weight 27 to the balance wheel 22. In the illustrated embodiment of my invention, the lever is not pivoted directly to the wheel 22 but the relative movement is transmitted from the lever 25 to the balance wheel 22 by means of a link 28 pivoted at 29 to the lever 25 intermediate of the ends of said lever and at the angle thereof, the link being also pivoted at one end at 30 to the balance wheel eccentric to the axis of said wheel. Said link 28 is also provided with an extension 31 projecting beyond the pivot 29. The

balance wheel 22 steadies the magneto shaft 2 in its rotation as the movable wiper or other contact thereof engages the fixed contacts of the magneto by the balance wheel 22.

There are usually two levers 25 and 28 arranged to balance each other on diametrically opposite sides of the driving shaft 1, one of the levers 25 being omitted in Fig. 2.

The outward throw of each centrifugal member 25 is retarded, in order that the driven shaft 2 will not be advanced too rapidly, by means of a spring carried by the circular flange 23 of the rotatable member or balance wheel 22 and acting on the weighted end 27 of the lever 25.

Usually two springs 32 and 33 are employed for each lever 25 and these springs are arranged to come in action successively, the second spring 33 acting supplemental to the first spring 32. As here illustrated the springs 32 and 33 are leaves fixed at corresponding ends to the inner face of the circular flange 23 of the balance wheel 22 and having their free ends arranged to act on the weight 27 of the contiguous lever 25, the free end of the spring 33 being arranged to the outward of the free end of the spring 32, and arranged to engage the spring 32 some distance from its end so that the spring 32 fulcrums on the end of the spring 33, and only the resiliency of the short section of the spring 32 in front of the fulcrum point acts on the weight 27. As here illustrated each spring 33 is formed with an elbow 34 which engages the inner face of the circular flange 23, and the front section of the spring 33 inclines at an oblique angle toward the spring 32. The springs 32 and 33 are thus of different leverages. This arrangement of springs causes the proper advance or retarding of the spark as the speed of the engine varies.

In operation, upon the starting of the engine, the sparking is delayed relatively to the position of the pistons in the cylinders and as the speed of the driving shaft increases the weighted ends 27 of the levers 25 are thrown outwardly and the outward movement is transmitted through the links 28 to the balance wheel and the magneto shaft 2, thus shifting the magneto shaft 2 about its axis a part of a revolution relatively to the driving shaft 1 and thereby shifting the terminal-carrying lever 13 relatively to the non-shiftable cams 16. When the spark approaches its highest point in the cylinders of the engine, with respect to the positions of the pistons in the cylinders, the outward throw of the centrifugal levers 25 is gradually restrained by the springs 32 and 33 and hence owing to the leverages of the springs the advance of the spark is gradually cut down.

What I claim is:—

1. In a governing means, driving and driven shafts arranged in axial alinement, and mechanism for coupling the shafts including a member mounted on, and fixed to, the driven shaft, a lever pivoted to the driving shaft eccentric to the axis thereof and having a weight at its outer end, and a link pivoted to the lever and being pivoted directly to said member on the driven shaft eccentric to the axis thereof, substantially as and for the purpose described.

2. In a governing means, driving and driven shafts arranged in axial alinement, and mechanism for coupling the shafts including a balance wheel mounted on, and fixed to, the driven shaft, a lever pivoted to the driving shaft eccentric to the axis thereof and having a weight at its outer end, and a link pivoted to the lever between the ends of said lever and at the end of said link directly to the balance wheel eccentric to the axis thereof, substantially as and for the purpose specified.

3. In a governing means, a driving element, a driven element, and mechanism for coupling said elements including centrifugal means for shifting the driven element about its axis relatively to the driving element as the speed of the driving element varies, and springs arranged to come into action successively for retarding the advance of the driving element, substantially as and for the purpose set forth.

4. In a governing means, a driving element, a driven element, and mechanism connected to said elements including a rotatable member movable with one of said elements, a centrifugal member pivotally connected to the other of said elements and to the rotatable member, and springs carried by the rotatable member and arranged to act on the centrifugal member to retard the outward throw thereof, the springs being arranged to come into action successively as the centrifugal member throws outwardly, and one spring being arranged to act supplemental to the other spring, substantially as and for the purpose described.

5. In a governing means, a driving shaft and a driven shaft arranged in axial alinement and mechanism for coupling the shafts including a balance wheel mounted on and fixed to the driven shaft and having a circular flange, a lever located within the flange and pivoted at one end to the driving shaft eccentric to the axis thereof, and having a weight at its opposite end, means connecting the lever and the balance wheel, and a spring carried by the circular flange on the inner face thereof and arranged to engage the weighted end of the lever as the lever throws outwardly, substantially as and for the purpose specified.

6. In a governing means, a driving shaft and a driven shaft arranged in axial alinement and mechanism for coupling the shafts

including a balance wheel mounted on and fixed to the driven shaft and having a circular flange, a lever located within the flange and pivoted at one end to the driving shaft eccentric to the axis thereof, and having a weight at its opposite end, means connecting the lever and the balance wheel, and leaf springs fixed at corresponding ends to the circumferential flange, one being arranged to the outward of the other, the inner spring being arranged in the path of the weighted end of the lever and the outer spring, substantially as and for the purpose set forth.

7. In a governing means, a driving shaft and a driven shaft arranged in axial alinement and mechanism for coupling the shafts including a balance wheel mounted on and fixed to the driven shaft and having a circular flange, a lever located within the flange and pivoted at one end to the driving shaft eccentric to the axis thereof, and having a weight at its opposite end, means connecting the lever and the balance wheel, and leaf springs fixed at corresponding ends of the circumferential flange, one being arranged to the outward of the other, the inner spring being arranged in the path of the weighted end of the lever, and the outer spring being formed with an elbow engaging the inner face of the flange, the portion of the outer spring in advance of the elbow extending toward the free end of the inner spring and the free end of the outer spring being arranged to engage the inner spring, substantially as and for the purpose described.

In testimony whereof, I have hereunto signed my name in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 27th day of June 1910.

JOHN WILKINSON.

Witnesses:

G. H. STILWELL,

R. L. STILWELL.