

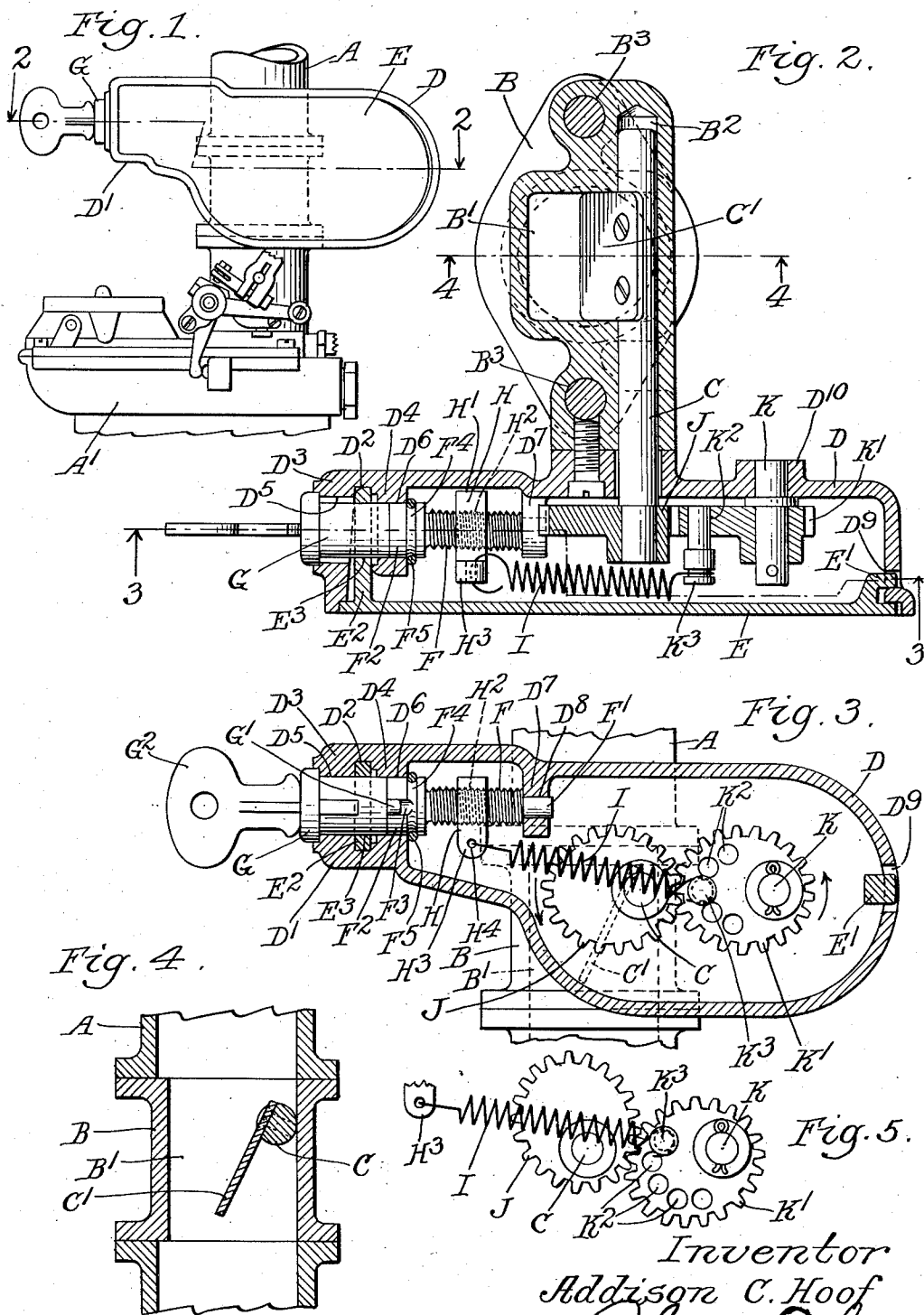
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A. C. HOOF

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GOVERNOR

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Inventor
Addison C. Hoof
by *Carke + Carke*
Attorneys.

UNITED STATES PATENT OFFICE

ADDISON C. HOOF, OF HINSDALE, ILLINOIS, ASSIGNOR TO THE CONTINENTAL ILLINOIS BANK AND TRUST COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

GOVERNOR

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This invention relates to a governor and has for one object to provide a governor adapted particularly for use in connection with internal combustion engines in which the governor is located somewhere in the intake line, so that the governor is affected in its operation by the air which is drawn into the engine.

One object is to provide a device in which
 10 a member is used which is moved by the movement of air into the engine and in which a resistance is provided against movement of the member, this resistance being progressively increased as the movement increases.
 15 Another object is to provide in connection with a governor of this general type a locking mechanism. A further object is to provide an adjusting means whereby the original resistance to motion of the governor may be adjusted. Other objects will appear from time to time in the specification and claims.

My invention is illustrated more or less diagrammatically in the accompanying
 25 drawing, wherein:

Figure 1 is a side elevation of a portion of the intake passage of an internal combustion engine showing my governor in position;

Figure 2 is a transverse cross section taken on line 2—2 of Figure 1;

Figure 3 is a cross section taken on line 3—3 of Figure 2;

Figure 4 is a cross section taken at line
 35 4—4 of Figure 2.

Fig. 5 is a diagram showing a modified initial position of the gears.

Like parts are designated by like characters throughout the specification and drawing.
 40 ing.

A is a portion of the intake passage of an internal combustion engine. The carburetor A¹ may be situated so as to discharge into this passage. The governor is located
 45 in the intake line of the engine and preferably between the carburetor and the combustion chamber.

The governor includes a housing B which is provided with a more or less rectangular
 50 bore or passage B¹. B² is a cylindrical bear-

ing cavity formed in the chamber B. B³ B³ are holes formed in the member B by means of which it may be attached in any suitable manner in connection with the intake passage A.

A shaft C is journaled in the cavity B² and it has fastened to it a valve member C¹ which approximates the shape and size of the passage B¹. 55

Fastened to the casting B is a governor housing D, which may be irregularly shaped
 60 as shown. At one end, as at D¹, it is preferably of reduced size. In the inside of the reduced portion D¹ is formed an enlargement D². On either side of the enlarge-
 65 ment D² which takes the form of a groove, there remain members D³ D⁴, which are provided with bores D⁵ D⁶ respectively. D⁷ is a projection extending into the interior of the housing D. It is provided with
 70 a perforation or bore D⁸. D⁹ is a notch formed in one end of the interior of the housing D. D¹⁰ is a bearing boss.

E is a cover plate. At one end it is provided with a lug E¹ which may fit into the
 75 notch D⁹. At its opposite end it is provided with a projection E² which is perforated as at E³. This projection fits into the enlargement D² when the cover plate is in position.

F is an adjusting screw provided with a
 80 reduced portion F¹ at one end, which portion is adapted to be inserted into the perforation D⁸ in the member D⁷. At its opposite end the screw is provided with an enlarged head F² which is notched as at F³.
 85 The screw may have in the sides of the head F² a groove F⁴, within which a locking ring F⁵ may be removably positioned to hold the screw in place.

G is a lock. It is provided with a down-
 90 wardly projecting member G¹ which, when the lock is in position, fits into the notch F³ so that rotation of this member will rotate the adjusting screw. G² is a key by means of which the lock may be locked and unlocked
 95 and rotation effected. The details of the locking mechanism are not shown as they form no particular part of the present invention. It is sufficient that a locking means is provided and that the adjusting
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screw can be locked against movement and can be unlocked to permit movement.

H is an adjusting screw nut. It is provided with a flat side H^1 adapted to bear against the interior of the wall of the housing, in the reduced portion D^1 . It is provided with a threaded perforation H^2 within which the shaft of the screw F is threaded. Rotation of the screw causes longitudinal movement of the nut. Extending from one side of the nut is a projection H^3 provided with a perforation H^4 .

A spring I is fastened at one end in the perforation H^4 of the projection H^3 .

The shaft C projects at one end into the housing D. At that end and within the housing, it has eccentrically mounted upon it an elliptical gear J.

Mounted in the boss D^{10} , which is provided with a perforation, is a short shaft K. Eccentrically supported on this shaft is a second elliptical gear K^1 which is in mesh with the first mentioned elliptical gear J. The gear K^1 may have a plurality of perforations or other positions of attachment K^2 formed in it. In one of these a pin K^3 is positioned. One end of the spring I is fastened on the pin K^3 .

It will be realized that while I have shown and described a practical operative device, nevertheless many changes might be made in the size, shape, number and disposition of parts without departing materially from the spirit of my invention and I wish, therefore, that my showing be taken as in a sense diagrammatic. In particular, the initial position of the gears before movement of the butterfly valve takes place might be altered. As here shown, the longest radius of the gear K^1 is opposite the shortest radius of the gear J. This might be the arrangement but is not necessarily the arrangement. The gears might in their initial position be arranged in almost any other manner, as for example, the position indicated in Figure 5. The initial position of the gears might thus be almost infinitely varied to suit the varying requirements of a very wide range of engines. The gears might be of different sizes and for some purposes it would be satisfactory to have the attachment of the spring on the gear carried by an extension which might project radially or axially beyond the gear.

The use and operation of my invention are as follows:

The invention may be embodied in any mechanism in which the movement of a fluid through a passage is to be controlled. In the form illustrated it is applied to control an internal combustion engine. It thus acts as a speed governor for the engine. The spring tension being adjustable is originally set or adjusted so that the force acting upon the butterfly valve as the result of the move-

ment of the fluid past it will be balanced by the resistance to movement caused by the spring and thus the governor acts to control the size of the passageway through which fuel may move into the engine and by reason of this control, it controls the speed of the engine. As fluid causes the butterfly valve to move, the shaft upon which it is mounted rotates and the elliptical gear which that shaft carries rotates with it, thus rotating the second elliptical gear with which it meshes. One end of the tension spring is attached to this second elliptical gear. As the gears move in the direction indicated by the arrows in Figure 3, the tension spring is constantly stretched further and as the gear to which it is mounted continues to move, the radius of motion is increased and thus the power required to stretch the spring further increases in proportion as the movement of the butterfly valve continues and thus with each added increment of movement of the valve, the resistance to further movement increases in an increasing proportion.

I claim:

1. In combination in a mixture flow governor for an internal combustion engine, a housing provided with a portion adapted to be inserted in the fuel supply line of the engine, and a portion attached thereto, adapted to include a resistance mechanism, comprising a movably mounted shaft positioned partly in each of the housing parts, a member fixed to said shaft projecting within the fuel supply line, an elliptical gear at the opposite end of said shaft, a second elliptical gear meshing with said first gear, a spring positioned at one end upon said second gear, and at the other end upon a mounting.

2. In combination in a mixture flow governor for an internal combustion engine, a housing provided with a portion adapted to be inserted in the fuel supply line of the engine, and a portion attached thereto, adapted to include a resistance mechanism, comprising a movably mounted shaft positioned partly in each of the housing parts, a member fixed to said shaft projecting within the fuel supply line, an elliptical gear at the opposite end of said shaft, a second elliptical gear meshing with said first gear, a spring adjustably positioned at one end upon said second gear, and at the other end upon a mounting.

3. In combination in a mixture flow governor for an internal combustion engine, a housing provided with a portion adapted to be inserted in the fuel supply line of the engine, and a portion removably attached thereto, adapted to include a resistance mechanism, comprising a movably mounted shaft positioned partly in each of the housing parts, a member fixed to said shaft projecting within the fuel supply line, an ellip-

tical gear at the opposite end of said shaft, a second elliptical gear meshing with said first gear, a coil spring adjustably positioned at one end upon said second gear, and
 5 at the other end upon a mounting, a lock controlled means for varying the position of said adjustable mounting.

4. In a fluid flow governor for internal combustion engines, a member movably positioned in the intake passage of the engine, adapted to be moved by the flow of fluid toward the engine, in combination with a pair of elliptical gears in mesh with each other, means for causing one of them to rotate in response to movement of said first mentioned member, said elliptical gears being so positioned that before movement a longer radius of one gear is opposite a shorter radius of the other.

20 5. In a fluid flow governor for internal combustion engines, a member movably positioned in the intake passage of the engine, adapted to be moved by the flow of fluid toward the engine, in combination with a pair of elliptical gears in mesh with each other, means for causing one of them to rotate in response to movement of said first mentioned member, a spring adjustably attached at one end to one of said gears, said elliptical gears being so positioned that before movement a longer radius of one gear is opposite a shorter radius of the other.

35 6. In a fluid flow governor for internal combustion engines, a member movably positioned in the intake passage of the engine, adapted to be moved by the flow of fluid toward the engine, in combination with a pair of elliptical gears in mesh with each other, means for causing one of them to rotate in response to movement of said first mentioned member, a spring adjustably attached at one end to one of said gears, said elliptical gears being so positioned that before movement a longer radius of one gear is opposite a shorter radius of the other, the spring so proportioned and positioned that during all positions of movement of the gears its full length is uninterrupted and effective.

50 7. In a fluid flow governor for internal combustion engines, a member movably positioned in the intake passage of the engine, adapted to be moved by the flow of fluid toward the engine, in combination with a pair of elliptical gears in mesh with each other, means for causing one of them to rotate in response to movement of said first mentioned member, a spring adjustably attached at one end to one of said gears, and mounted at its other end on an adjustable mounting, said elliptical gears being so positioned that before movement a longer radius of one gear is opposite a shorter radius of the other.

35 8. In a fluid flow governor for internal combustion engines, a member movably po-

sitioned in the intake passage of the engine, adapted to be moved by the flow of fluid toward the engine, in combination with a pair of elliptical gears in mesh with each other, means for causing one of them to rotate in response to movement of said first mentioned member, a spring adjustably attached at one end to one of said gears, and mounted at its other end on an adjustable mounting, said elliptical gears being so positioned that before movement a longer radius of one gear is opposite a shorter radius of the other, the spring so proportioned and positioned that during all positions of movement of the gears its full length is uninterrupted and effective.

Signed at Chicago, county of Cook and State of Illinois, this 4th day of April, 1930.

ADDISON C. HOOF. 85

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