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L. KAMENAROVIC
CENTRIFUGAL GOVERNOR

2,196,360

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FIG. 1

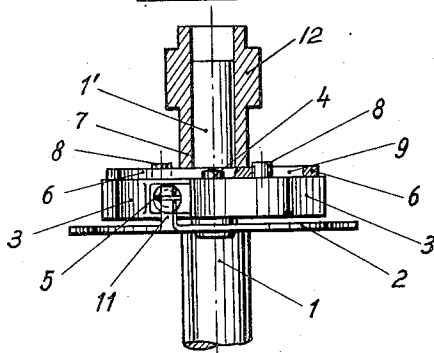


FIG. 2

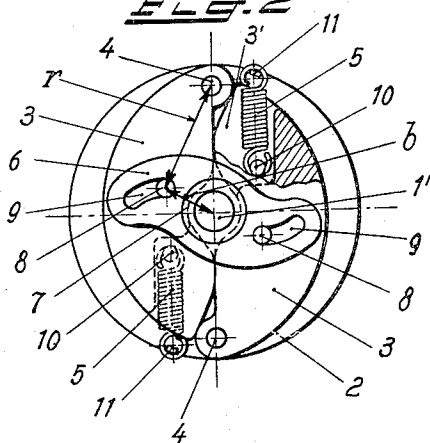


FIG. 3

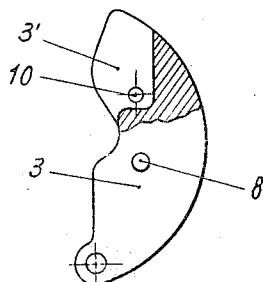
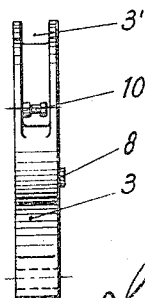


FIG. 4



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UNITED STATES PATENT OFFICE

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CENTRIFUGAL GOVERNOR

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In Italy October 8, 1937

1 Claim. (Cl. 64—25)

This invention relates to centrifugal governors and more particularly to the governors devoted to the control of the ignition point or generally of the operative rate of internal combustion engines and it has for its object a governor of said class in which the objections depending upon mutual frictional actions of the several parts of the governor are removed and particularly useful conditions of operation are secured.

An embodiment of the present invention is illustrated by way of example on the annexed drawing and

Fig. 1 is a side view thereof,

Fig. 2 is a top plan view with a portion removed,

Fig. 3 illustrates separately a centrifugal mass of the governor in plan view with a portion removed, and

Fig. 4 is a side view of said mass from left hand as seen in Fig. 3.

The governor of this invention includes a driving shaft 1 having a disk plate 2 fast therewith; centrifugal masses 3 are pivoted on the disk 2 by means of pivot studs 4 fast on said disk and respective return springs 5 arranged in the hereinafter described manner tend to restore said masses and cooperating parts against the centrifugal force.

The shaft 1 has an extension 1' having a reduced diameter and a governed cross member 6 is loose on said extension 1'; a sleeve 7 is fast with the cross member 6 and carries a cam member 12 which is assumed to operate a circuit breaker in the circuit of an electric ignition device of an internal combustion engine, not shown.

The centrifugal masses 3 have fingers 8 cooperating with the governed member 6 to move it with the sleeve 7 and cam 12 angularly with respect to the driving shaft 1, 1', said fingers 8 engaging respective slots 9 which are provided in the governed member 6 and have a suitable configuration and direction.

As apparent, due to the described arrangement at each given rotary speed of the shaft 1, the angular position of the sleeve 7 with respect to the shaft 1 depends upon the position taken up by the masses 3 under the combined actions of the centrifugal force and return spring 5 operative thereon, and also upon the shape or configuration of the profile of the slots 9 engaged by fingers 8 carried by said masses.

Each of the mass return springs 5 is connected directly with a stud 10 of the cooperating mass and with a lug 11 of the disk 2; each of said masses 3 has an intermediate recess 3' in which

the stud 10 extends and the cooperating spring 5 is located, the action of each spring 5 on the respective mass being thus operative in the middle plane of the concerned mass 3.

Further the finger 8 of each mass 3 intended to engage a slot 9 of the governed member 6 has such a location on said mass and said slot 9 has such a shape that when the concerned mass 3 is in its normal low speed or inoperative position, the line of the possible action the governed member 6 may impart to the cooperating finger 8 and mass 3 extends through the center of the pivot 4 of said mass on the driving disk 2; such a condition is shown on the drawing. In Fig. 2 the line *b* which connects the center of the finger 8 with the axis of rotation of the controlled member 6 is perpendicular to the line *r* which extends from the center of the finger 8 of said mass to the center of the pivot stud 4 of said mass on the driving disk 2, and the surface confining the slot 9 provides for cooperation with the finger 8 in the illustrated location the parts have in low-speed operation, an engaging region which develops on said finger a reaction operative on a line substantially coincident with said line *r*.

Owing to the described arrangement of the return springs 5 each of which has one end engaged with the disk 2 and acts directly on the respective mass 3 instead of operating on the governed member 6, 7 as in usual devices, the frictional actions between the side faces of the slots 9 of the governed member 6 and the fingers 8 of the masses as due to the load developed by the springs 5 are nullified and accordingly no deformation is imparted to the characteristic line of the governor; as a matter of fact owing to the arrangement of this invention the fingers 8 of the masses 3 operate substantially without friction on the sides of the slots 9 of the governed member 6 which is thus made able to follow very small variations in the position of the masses 3 during the governor operation without any appreciable resistance.

Further, the return springs 5 of the masses 3 act in the middle plane of the respective masses and accordingly they do not develop torques on said masses nor frictional actions thereof on the respective pivot studs 4 which could cause them to bind on the respective pivotal studs 4 or also on the disk 2 carrying them.

Finally due to the above defined location of the fingers 8 on the masses 3 and shape of the slot 9 for the connection of said masses with the governed member 6, the advantage is secured that at the time the governor is driven at low speeds

the vibrations the governed member 6 may be subject to owing to the engine operation cannot cause a creeping motion of the masses 3 and a consequent undue variation in the respective angular position of the governed member 6 with respect to the driving shaft 1.

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

A centrifugal governor comprising a driving member, a centrifugal force responsive mass pivoted on said driving member, a return spring connected with said mass and said driving member, a governed member aligned with said driving member and having a shaped slot and a finger

on said mass operatively engaging said slot, said finger having such a location on said mass that, when said mass and governed member are in their normal low speed position, said finger lies substantially on a radius extending through the axis of rotation of said governed member in a direction perpendicular to the line extending through the center of said finger and the pivotal center of said mass on said driving member, the line of coaction of the slot confining surface and of said finger in said low speed position being substantially coincident with the above defined line.

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