Aug. 31, 1926. 1,597,970

A. J. HARTLEY

GOVERNOR

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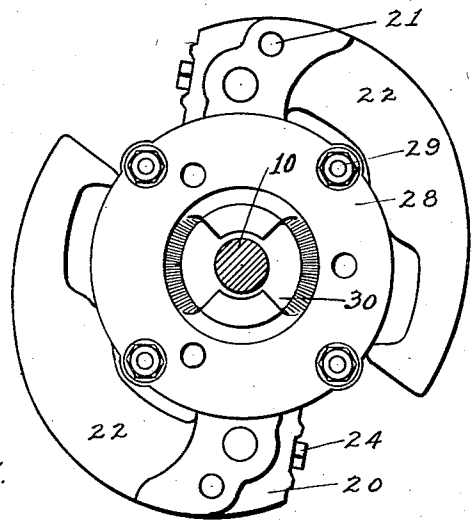



Fig. 1.

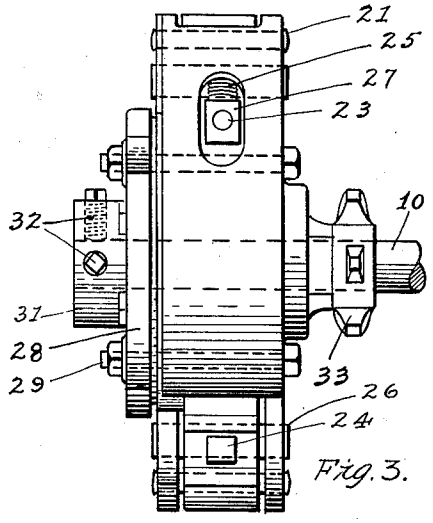



Fig. 3.

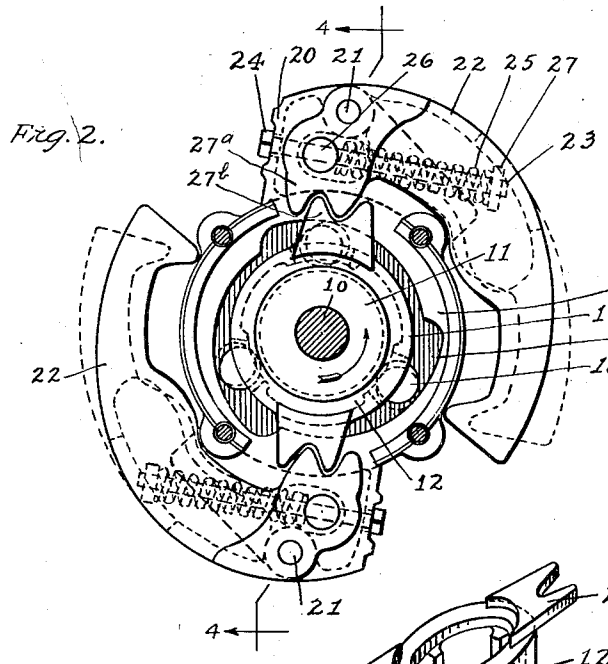



Fig. 2.

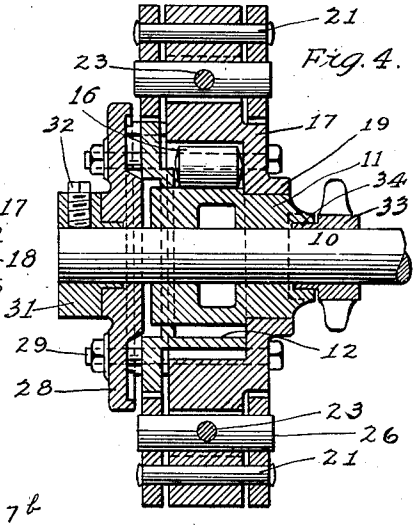



Fig. 4.

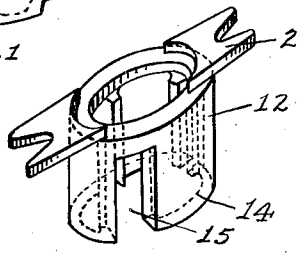



Fig. 5.

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# UNITED STATES PATENT OFFICE.

ARTHUR J. HARTLEY, OF PEORIA, ILLINOIS.

## GOVERNOR.

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My invention relates to governors.

The object of my invention is in the provision of governor mechanism comprising means for effectively and instantly operating a clutching mechanism when a determined speed has been attained.

Another object of my invention is in the provision of a governor wherein a roller clutch mechanism is controlled by a variable speed mechanism.

A further object of my invention is in the provision of a governor mechanism utilizing a special clutch member that becomes more positive with increased load, irrespective of the speed of the machine upon which it is used.

Other objects of my invention will appear in the following specification taken in connection with the annexed drawings in which:

Fig. 1 is an end elevation of my device.

Fig. 2 is a partial cross sectional view of Figure 1.

Fig. 3 is an end elevation of the governor.

Fig. 4 is a longitudinal sectional view taken on the line 4—4 of Figure 2, and:

Fig. 5 is a perspective of the roller cage member.

Referring to the drawings, I have shown a drive shaft 10, upon which is located a governor member to be later described. Surrounding the drive shaft 10, is a drum 11, said drum being loosely mounted upon the drive shaft. Encircling the drum 11, is a cage 12, shown in detail in Figure 5 of the drawings. This cage 12, has its hub portion 14 recessed as at 15 at three equi-distant points thereon, said cut out portions 15 adapted to house therein the roller members 16. A housing portion 17 surrounds the roller cage in a manner to provide roller or cam ways 18. As shown in Figure 4 the hub portion 19 of the housing member bears upon the drum 11. Projecting portions 20 of the housing have pivotally attached thereto at 21 the weight members 22. Means for relating the weight members to the housing 17 in a tensioned manner is provided in the bolts 23, which engage the supports 20 by means of their head portions 24, coil tensioning springs 25, and cross lugs 26, said lugs engaging at their outer ends the bifurcated ends of the weight members and also providing an abutment intermediate their ends, for the ends of the tensioning springs. The coil springs naturally retard the outward movement of the weight members caused by centrifugal action. Nuts 27 are screw threaded upon the outer ends of the bolt members and provide means for adjusting the tension of the weight members. The inner ends $27^a$ of the weight members 22 are fashioned to engage in an operative manner similar claw shaped projections $27^b$ on the cage member 12. The governor housing 17 is positively connected to the drive shaft 10 by the following mechanism. A plate 28 is bolted at the points 29 to the housing, said plate having a clutch face 30 adapted to engage a similar clutch portion upon the member 31 which is keyed positively to the shaft 10 by means of a set screw 32.

The above described means for positively connecting the governor housing to the drive shaft has been utilized, in that it makes a structure practicable for manufacture, but any means for directly or otherwise connecting the housing positively to the drive shaft might well be used.

A sprocket 33 loosely mounted upon the shaft 10 has a clutch face 34 adapted to engage a similar clutch face on the loosely mounted drum 11.

The operation of my device is as follows:

As described in the objects of my invention, the present structure was devised to permit a quickly acting clutch operation, said clutch operation controlled directly and entirely by variations in the speed of the driving element which controls the clutch.

Excess loads upon any structure in which the present governor might be used would not result in slippage, so common in the friction type, inasmuch as the present governor after once being clutched, due to the form or shape of the cam members, becomes more positive with increased load. The governor housing and portions connected thereto including the cage member, rollers and weight members are positively connected to the drive shaft 10 through the plate 28 and portion 31, thus movement of the shaft 10 rotates the above mentioned portions about the drum 11 which is loosely mounted upon the shaft 10.

It is desirable of course upon the governor having reached a predetermined speed that the drum which has a sprocket 33 in connection therewith, be rotated also. This clutching of the drum 11 is accomplished in the following manner:

Centrifugal action due to the rotation of the governor throws weight members 22 out-

wardly in the manner shown in the dotted line figure in Figure 2. This outward movement of the weight members through the action of the claws 27ª and 27ᵇ, moves simultaneously the cage 12 in a clockwise manner as well as the rollers contained in the recesses therein. This clock-wise movement of the cage forces the rollers between the periphery of the drum 11 and the cam like surfaces 18 on the inside of the housing 17 with the result that a clutching of the drum to the housing is effected and the drum consequently moves therewith.

It may be seen that with increased speed the weight members will be thrown outwardly to an even greater extent, with a consequent tightening or forcing of the rollers between the drum and housing.

It may thus be seen that increasing speed of the governor merely augments the clutching operation, said clutching operation having taken place almost instantly and with no perceptible slippage when the rollers were moved to points where they engaged both the drum and the housing member.

It may also be seen that immediately the cam engages the rollers with the drum and thus starts to drive the drum member, the tendency of the drum is to run backward which tends to roll the rollers into firmer engagement between the cam and the drum. The greater the driving load placed on the drum, the greater this tendency becomes.

Thus it will be seen that the clutch once engaged, the greater the load, the greater the driving power, irrespective of the increase of the speed of the mechanism. As soon however as the speed drops below the predetermined engagement speed the weights are drawn back by the springs and the motion of the roller cage is reversed and the rollers thrown out of engagement with the drum and the cams.

What I claim is:

1. In a device of the class described, in combination, a drive shaft, a driven member, a governor housing connected to said drive shaft and adapted to rotate therewith, tensioned weight members pivoted upon said housing and means for clutching the driven member to the drive shaft when said shaft has attained a pre-determined speed including a cage member controlled by the movement of said weight members and roller members retained by said cage member and adapted to engage the driven member and the inside of the governor housing when moved to such position by said cage member.

2. In a device of the class described, in combination, a drive shaft, a governor housing connected to said drive shaft, and adapted to rotate therewith, tensioned weight members pivoted upon said housing, a driven member and means for clutching the driven member to the drive shaft, when said shaft has attained a predetermined speed, including a cage member controlled by the movement of said weight members and located between the governor housing and the driven member, said cage member having roller members therein, adapted to engage the driven member and the inside of the governor housing when moved to such position.

3. In a device of the class described, in combination, a drive shaft, a driven member, a governor housing connected to said drive shaft and adapted to rotate therewith, said governor housing having a cam shaped inner surface and surrounding the driven member, tensioned weight members pivoted upon said housing and means for clutching the driven member to the drive shaft when said shaft has attained a predetermined speed, including roller mechanism adapted to engage the driven member and the cam shaped governor housing, when moved to such position by said weight members.

4. In a device of the class described, in combination, a drive shaft, a driven member, a governor housing connected to said drive shaft, and adapted to rotate therewith, tensioned weight members, pivoted upon said housing, and means for clutching the driven member to the drive shaft, when said shaft has attained a predetermined speed including a roller clutch adapted to engage the driven member and the inside of the governor housing when moved to such position by the weight members.

5. In a device of the class described, in combination, a drive shaft, a driven member, a governor housing connected to said drive shaft and adapted to rotate therewith, tensioned weight members pivoted upon said housing and means for clutching the driven shaft to the drive shaft when said shaft has attained a predetermined speed and to increase the clutching action in direct proportion to the load upon the driven member, including a roller clutch member located between the driven member and the governor housing and adapted to be thrown into engagement with both of said members by the outward movement of the weight members.

In testimony whereof I affix my signature.

ARTHUR J. HARTLEY.