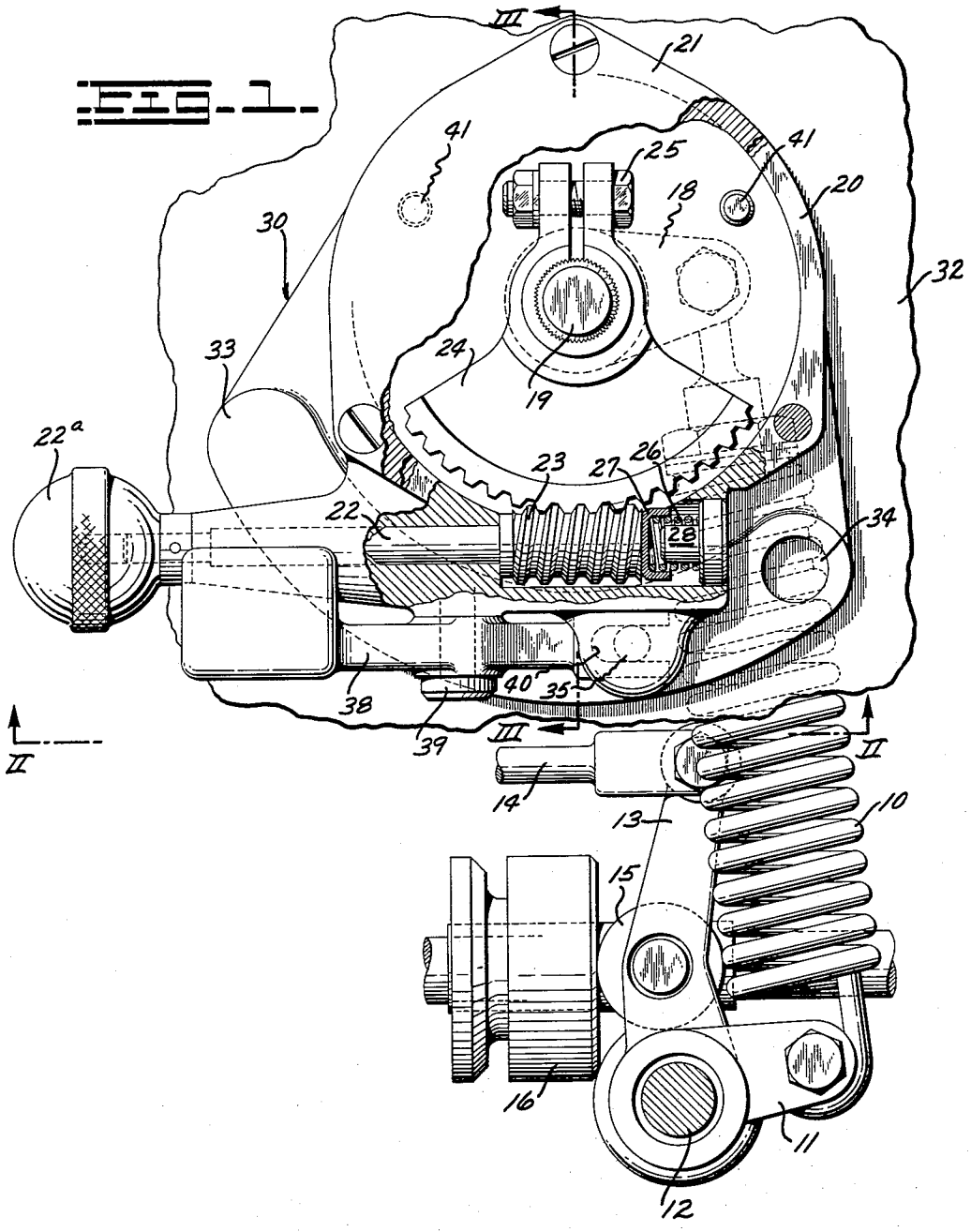
May 29, 1956 R. R. ROBINSON 2,747,426

ENGINE SPEED CONTROL MECHANISM

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Fig. 1



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FIG. 2

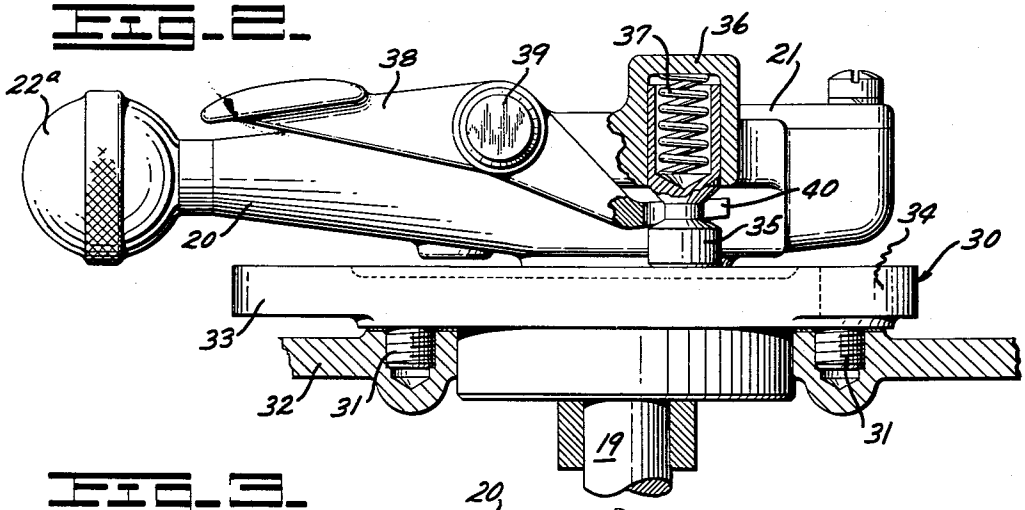
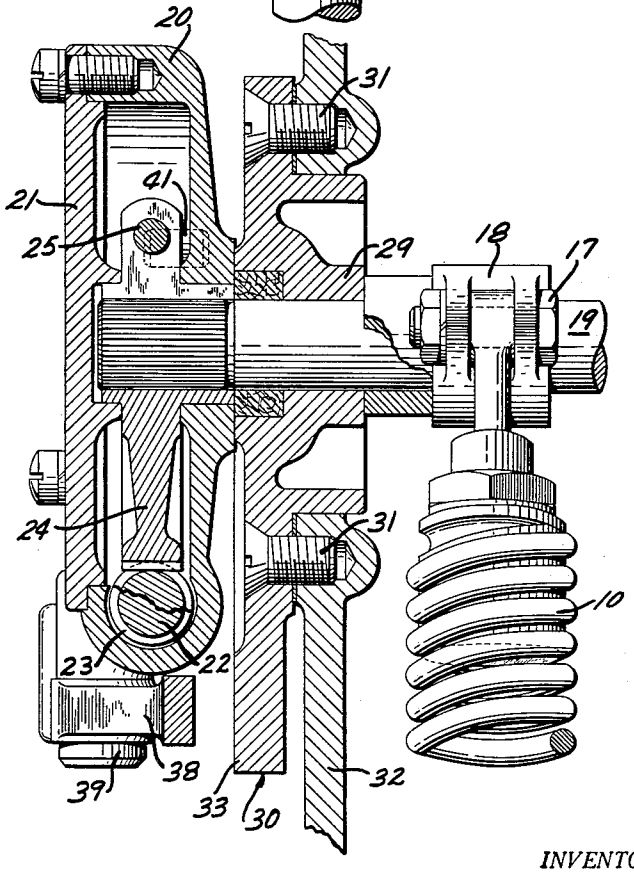


FIG. 3



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ENGINE SPEED CONTROL MECHANISM

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2 Claims. (Cl. 74—507)

This invention relates to control means for use on engine governors and the like and is disclosed herein in its application to a spring balanced governor of the kind generally employed in connection with engines of the compression ignition type.

There are various applications of engines in which a certain operating speed is determined as ideal and there is little or no requirement for operation at any other speed. For example, an engine employed for driving a pump or electric generator set must operate at a given speed which is critical in that it is required for an exact output of fluid pumped or electrical energy generated. This speed is usually somewhat less than the maximum rated speed of the engine and for convenience may be referred to as operating speed.

The present invention contemplates the provision of governor or speed control mechanism for an engine in which a manual control lever may be accurately set at a certain operating speed then moved to shut down position and thereafter quickly returned to precisely the same operating position for which it was originally set.

It is the object of the invention to provide a control for a governor or the like with a manual control element having means for holding it in a fixed position and with a vernier adjustment for varying the speed of operation of the engine while the lever occupies said fixed position. A further object is to provide such means in a structure which will enable convenient adjustment and will permit the control element to be freely moved between its engine shut down position and the adjusted operating position. Further and more specific objects and advantages of the invention are made apparent in the following description wherein the invention is described in detail by reference to the accompanying drawings.

In the drawings:

Fig. 1 is a view in front elevation of an engine governor control and a portion of the governor mechanism controlled thereby with parts broken away to disclose certain features of construction,

Fig. 2 is a bottom plan view of the governor control mechanism illustrated in Fig. 1 as viewed from the line II—II in Fig. 1 and with parts broken away, and

Fig. 3 is a sectional view of the governor control mechanism taken on the line III—III of Fig. 1 but with a portion of the governor spring and upper anchor therefore added.

To illustrate the invention, a conventional governor spring is shown at **10** as connected in tension to a lever **11** fixed to a shaft **12**. Also fixed to the shaft is a lever **13** connected at its end with a fuel supply control member **14**, such, for example, as the rack bar which adjusts fuel pumps to vary the volume of fuel directed to an engine. The lever **13** carries a roller **15** engageable by a sliding thrust collar **16** which is influenced by conventional fly weights (not shown) to swing the lever **13** and rack bar **14** toward engine shut down position as the fly weights swing outwardly in response to operating speed. The tension of the spring **10** tends in the conventional manner to oppose the action of the fly weights and maintain the engine in operation. Therefore, the engine speed is controlled by varying the tension of the main governor spring **10**. To vary this tension, the upper end of the spring is anchored as by a bolt **17** to a lever **18** fixed against rotation by means (not shown) on a shaft **19**.

The shaft **19** may be rocked to vary the tension of the spring **10** by means of a control lever which is connected with the shaft through the medium of a case **20** having a cover **21** thereon and also through vernier adjusting mechanism in the case. The control lever comprises a shaft **22** rotatable in a suitable bore in the case and having a knurled knob **22***a* at one end so that it may be rotated by hand. At its inner end, the shaft **22** carries a worm **23** meshing with a worm gear segment **24** fixed against rotation on the shaft **19** by a spline connection and a clamping screw **25**. Back lash between the worm and worm gear is taken up by a spring **26** and thrust cup **27** which bears against the end of the worm **23**. The spring is seated against a plug **28** tightly fitted in the end of the bore which releases the worm.

As best shown in Fig. 3, the case **20** is mounted for rotation about the hub of the worm gear segment **24** but is held against such rotation by the meshed engagement of the segment **24** with the worm **23**. The shaft **19** is carried for rocking movement in a bearing **29** formed in a plate **30** secured, as by cap screws **31**, to a wall **32** partially shown and which is a part of the housing enclosing the governor mechanism.

With the mechanism thus far described, the tension of the governor spring **10** may be varied by swinging the knob **22***a* about the axis of the shaft **19** to rock the shaft. An arcuate track **33** is formed as a part of the plate **30** and has a latch socket **34** adjacent one of its ends. A spring pressed latch pin **35** is mounted in a boss **36** on the case and is urged by a spring **37** into frictional contact with the track **33** over which it slides as the control lever is manipulated. When the control lever reaches the position corresponding to maximum rated engine speed, that is counterclockwise of the position illustrated in Fig. 1, the latch pin enters the rocket **34** and the lever is thereby locked against further rocking movement in either direction. Retraction of the latch pin is accomplished by a retracting lever best shown in Figs. 1 and 2 at **38**. This lever is pivoted to the case as by a pin **39** and has a bifurcated end **40** embracing the latch pin for retracting it when the end of the lever is depressed. The end of the lever is conveniently arranged for operation by the thumb of the hand which grasps the knob **22***a*.

In the operation of the device thus far described to establish a locking position for the governor setting the engine is first started and the control mechanism is moved to maximum rated speed position with the latch pin **35** engaged in its socket **34**. The speed of the engine is then reduced by rotation of the knob **22***a* which, through the vernier control afforded by the worm and quadrant, rocks the shaft **19** and adjusts the tension of the governor spring **10** without varying the position of the case **20** which is latched against movement. Suitably positioned pins **41** in the case **20** limit the movement of the segment **24** so that it cannot move beyond the position where it meshes with the worm. Now with the required engine speed established, the case **20** is latched in the correct position for producing that speed. Consequently the latch pin may be released and the engine shut down and, so long as the knob **22***a* is not rotated, the case may be returned to the same position without difficulty. When the engine is again started, it is simply necessary to swing the governor control lever to the position where it is automatically latched for the desired operating speed.

The use of this invention obviates the necessity of re-establishing an operating position which is frequently a tedious procedure each time the engine is started and also provides a vernier adjustment to be used in the original establishment of the operating position.

I claim:

1. In an engine speed control mechanism which includes a shaft to vary engine speed upon rocking motion, a worm and gear assembly associated with the shaft, a control lever to rock the shaft by swinging said assembly as a unit, means on the control lever to rotate the worm to rock the shaft while the unit is stationary, and means to latch the assembly against swinging movement during such rotation of the worm whereby a required engine speed may be established by rotation of the worm and reestablished by subsequent return of the assembly to its latched position.

2. In an engine speed control mechanism which includes a shaft to vary engine speed upon rocking motion, a worm gear fixed to said shaft, a case enclosing said gear and rotatable about the axis of said shaft, a lever rotatably mounted in said case, a worm on the lever meshing with said gear, and a releasable latch to hold the case against rotation whereby said shaft may be rocked by rotating said lever while the case is latched and rocked by swinging said lever and case when the case is released.

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