Feb. 6, 1951 R. REGER 2,540,910

GOVERNOR SHAFT AND YOKE ASSEMBLY

Filed June 28, 1946

FIG. 1

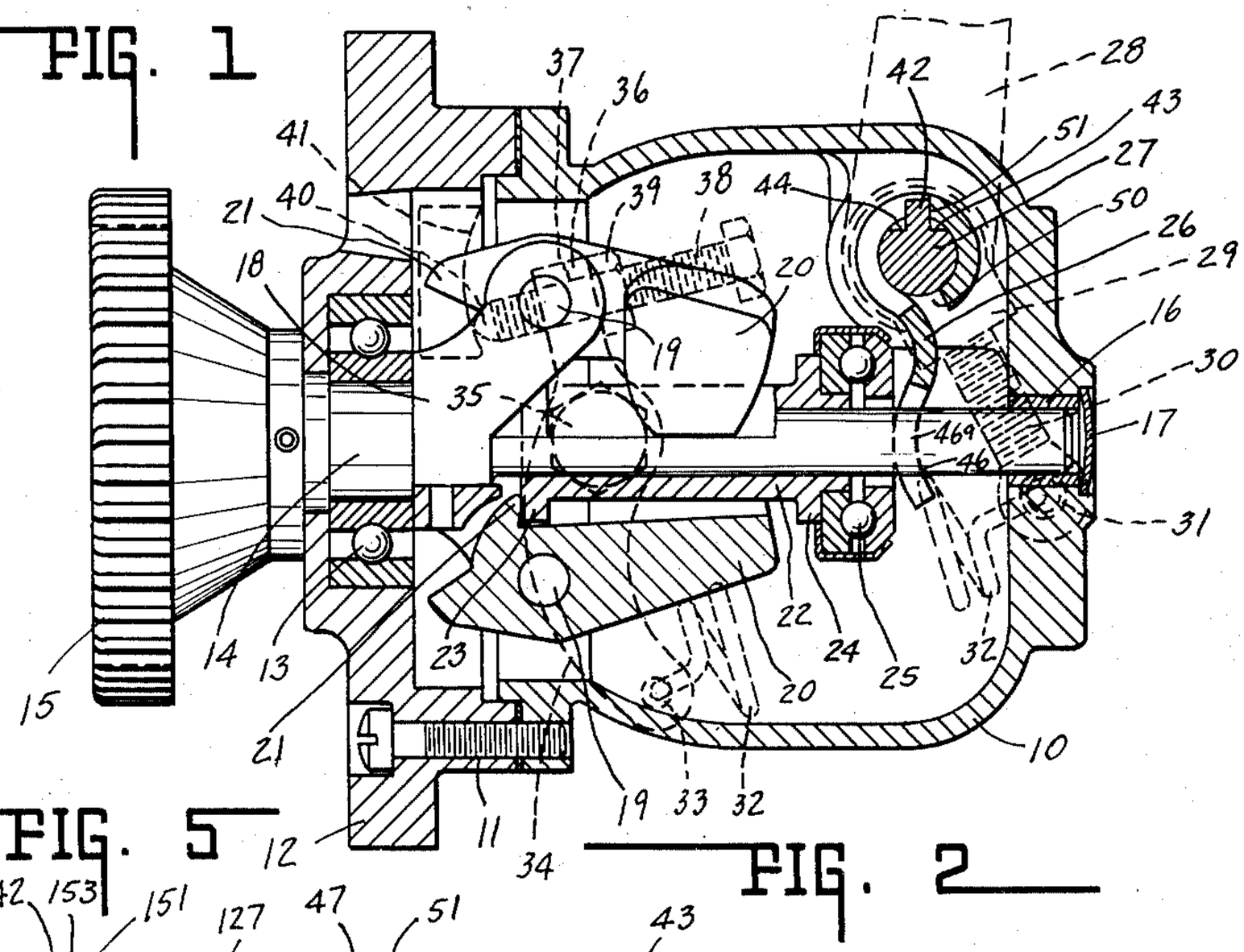


FIG. 5

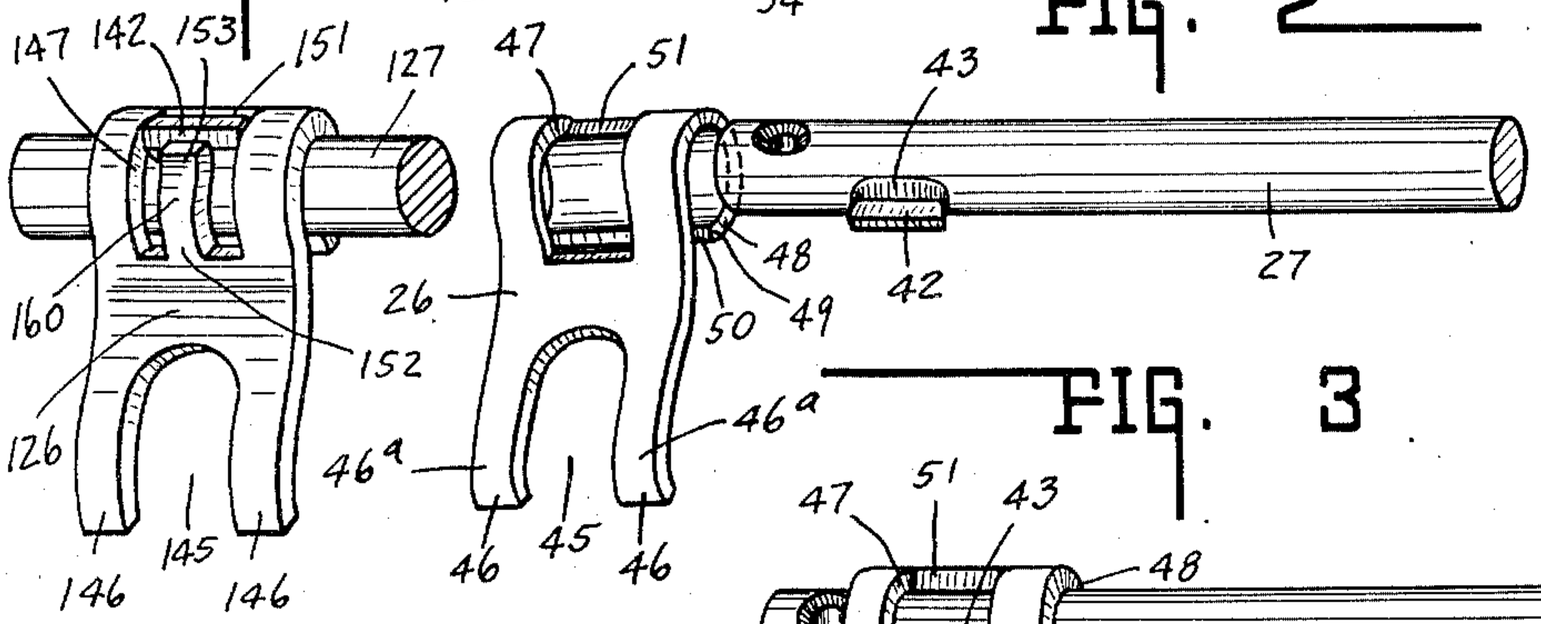


FIG. 2

FIG. 3

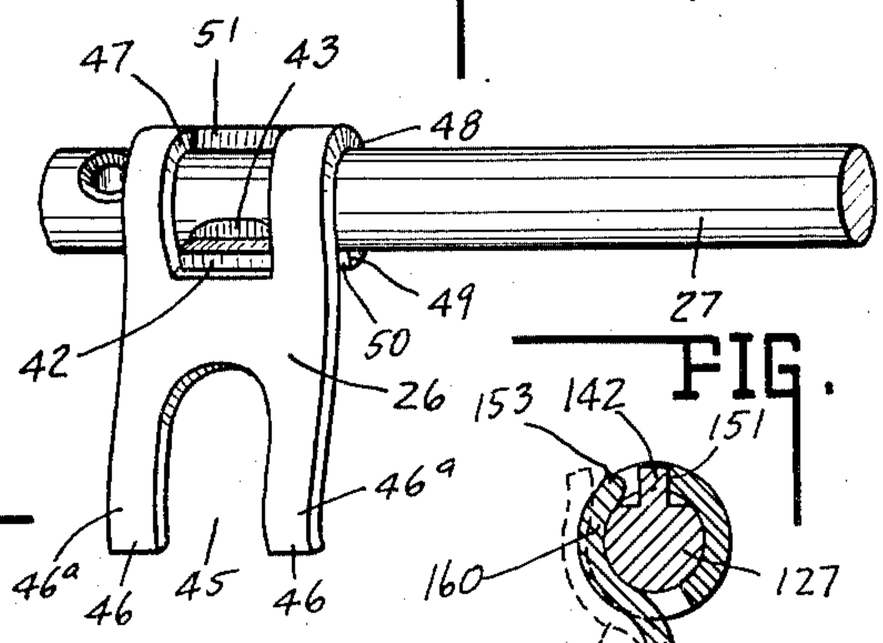


FIG. 6

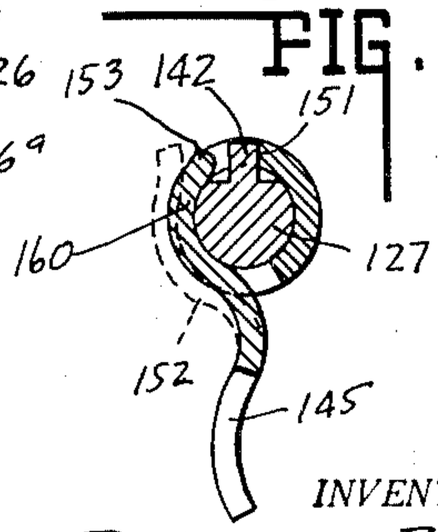
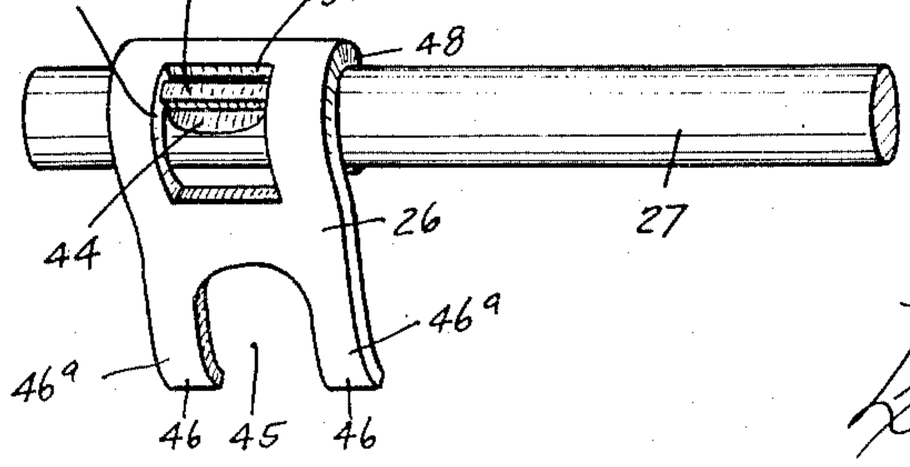


FIG. 4



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GOVERNOR SHAFT AND YOKE ASSEMBLY

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2 Claims. (Cl. 287—52.02)

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This invention relates to a centrifugal governor and more particularly to the yoke and rocker shaft.

One chief object of this invention is to provide in a centrifugal governor a yoke and rocker shaft assembly that is of simple character and not only positive in association but readily associated together and disassociated from each other.

Another chief object of the invention resides in the method of forming the rocker shaft and the yoke of a centrifugal governor.

One chief feature of the invention resides in the formation of a yoke from strap material by punching and bending and the formation of the rocker shaft by a heading operation.

Another chief feature of the invention resides in the specific formation of the yoke where shaft associated and the key on the shaft for such association and providing therebetween what might be termed a bayonet slot type connection. As a corollary of the aforesaid, no screws or pins are required for connecting the yoke to the shaft or vice versa and the association is of such character that there is an equalization of pressures of the two fingers of the yoke associated with the conventional thrust bearing member of a centrifugal governor.

A further feature of the invention resides in providing an integral locking tongue to prevent accidental separation of the yoke and rocker shaft.

Other objects and features of of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

In the drawings:

Fig. 1 is substantially a central sectional view through a centrifugal governor embodying the invention.

Fig. 2 is a disassociated or exploded perspective view of the yoke and shaft shown in Fig. 1.

Fig. 3 is a perspective view of the yoke and shaft shown in Fig. 1 associated together in a position preliminary to final positioning of said parts.

Fig. 4 is a similar view of the same parts in a final and operatively associated position.

Fig. 5 is a view similar to Fig. 4 and of a modified (positive lock) form of the invention.

Fig. 6 is a central sectional view of that form, dotted lines indicating the initial position of the locking tongue.

For a complete understanding of the invention, it appears highly desirable to briefly describe a centrifugal governor, as illustrated in Fig. 1 to which reference is now had.

Therein, 10 indicates a governor housing with which is detachably associated as at 11, a closure and maintaining plate 12 which supports an antifrictional construction 13 that rotatably supports

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a speed responsive shaft 14 that, externally of the governor housing, mounts a suitable drive element such as a gear 15, same meshing with some gear on an engine, the latter to be controlled by a governor as illustrated.

The other end of the shaft 14 is rotatably supported as at 16 in the end of the housing 10, the latter being suitably sealed as at 17, and provided with any type of shaft bearing structure. This shaft within the governor housing mounts a spider 18 or comparable support upon which is pivotally mounted as at 19 the governor weights 20 having the noses 21.

Fig. 1 shows the weights collapsed and in Fig. 1 two weights are illustrated by way of example, same being diametrically positioned and one being shown in central section and the other being shown in elevation.

Slidably mounted upon said shaft is a sleeve 22 having at one end the flange portion 23 juxtapositioned to the noses 21. The other end of the sleeve is also flanged as at 24 and associated therewith is a conventional thrust bearing structure generally indicated by the numeral 25.

A centrifugal governor insofar as previously described usually has associated with it a yoke carried by a rocker shaft of suitable form and extending transversely of the speed responsive shaft. Herein, 26 generally indicates the yoke and 27 the rocker shaft. This rocker shaft has at least one end extending through and beyond the housing 10. It is usually supported at the opposite side of the housing as well as by the aperture in the housing through which it extends.

On the exposed end of the shaft there is secured a lever 28, the same being suitably connected to a fuel control not shown whereby the speed of the engine may be governed in the conventional manner.

The exposed end of the rocker shaft also has secured to it an arm 29 and usually said arms has adjustably associated therewith a screw eye element 30 or the like providing an anchorage 31 for a load spring 32, the opposite end of said spring being anchored at 33 to a suitable anchorage Herein such anchorage comprises an arm 34 rigidly supported at 35 and extended at 36 and the extension 36 is apertured at 37 to adjustably mount a stop bolt 38 locked in the adjusted position by lock 39.

The stop bolt 38 has the bearing end 40 operatively associated with the abutment 41. Thus, as the bolt is threaded through the arm 36 toward the left in Fig. 1 the anchorage 33 is similarly moved to the left to increase the imposed force of spring 32. When the desired spring force is imposed upon the rocker shaft, through the arrangement just described, the adjustment is locked by the nut 39. The aforesaid is also conventional to the centrifugal governor art.

Reference will now be had to Figs. 1 to 4 of the

drawings wherein the shaft 27 is shown provided with an elongated key 42 formed by a heading tool taking stock from the shaft as at 43 and 44.

The yoke comprises a strap initially flat and cut to length and notched as at 45 to provide the space fingers as at 46 which straddle the speed responsive shaft and these fingers are arched slightly as at 46*a*, see in particular Fig. 1. The other end of the strap is recessed as at 47 and the recessed end is then curled as at 48 to cylindrical form having an internal diameter slightly greater than the external cylindrical surface of the shaft 27. The cylindrical socket 48 thus formed is not complete, the end 49 thereof terminating in spaced relation to the body portion of the strap to provide a slot 50 therebetween.

The method of assembly is as follows:

The yoke and shaft are initially positioned as shown in Fig. 2 and then the two are telescopically associated together, the throat 50 passing the key 42 until said key registers with recess 47 which position is shown in Fig. 3. Thereupon the two members are relatively rotated so that the rocker shaft and yoke are connected together and prevented from axial escape. This is the bayonet type association referred to.

This type of mounting is usually effected prior to the connection of the closure 12 with the housing 10 and with the shaft mounted in the housing 10. Thereupon the speed shaft, the sleeve, thrust bearing, spider and weights together with the closure 12 are operatively associated together as shown. Thereafter, the arms 28 and 29 are applied to the housing exposed shaft end and then the load spring is applied to the aforesaid as illustrated. Thereupon the spring force adjustment is effected.

As shown in Fig. 1, the weights are in the collapsed position and the speed shaft is either idle or rotating at a speed below which the centrifugal force is insufficient to overcome the force of the load spring. When centrifugal force is of such value that it initially overcomes the force of the load spring the sleeve 22 moves to the right and the thrust bearing 25, engaging the fingers 46 at the curved positions 46*a*, rotates the yoke counter-clockwise in Fig. 1. The shaft rotates therewith for the key 42 now engages the face 51 of the recess 47 and this movement of the shaft is opposed by the load spring and the effective movement resulting is translated by the arm 28 to the fuel control as previously mentioned.

It will be noted that the load spring 32 always tends to rotate the rocker shaft clockwise in Fig. 1, and this is for a limited movement of the shaft. While the engine is running the key 42 will always be engaged with the face 51 of the yoke. When it is desired to disassemble the structure the preceding operation of the assembly is reversed and sufficient relative movement, when the load spring is detached from the rocker shaft, will be permitted so that the yoke and rocker shaft may be disassociated by following through the steps illustrated in Figs. 1, 4, 3 and 2 respectively.

In Figs. 5 and 6 a positive lock type structure is shown. Herein shaft 127 includes integral tongue 142 as before. The yoke 126 includes recess 147 with face 151 as before. Herein, however, stock 160 is left projecting into recess 147 in the form of a tongue, and it is initially directed outwardly as at 152 and thence arcuately and terminates in free end 153 which terminates, when recess seated, in spaced relation to face 151.

After the yoke and shaft are assembled, as previously described, the outwardly directed tongue 160 is struck to position the free end 153, as shown, which locks the two members together. Insertion of a screw driver, etc., to elevate the free end 153 will permit tongue 142 to move longitudinally of the recess for member disassociation.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein, as well as others which will readily suggest themselves to persons skilled in this art, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In a yoke and rocker shaft structure for centrifugal governors, the combination of a strap member bifurcated at one end to form an actuable yoke and curled at the other end for socket formation, the said other end terminating short of engagement to form a restricted throat, the socket having an arcuate recess therein communicating at one end with the throat, a rocker shaft mounted in said socket and having a rotational movement therein and key means carried by the shaft and having a cross-sectional dimension smaller than said throat to permit the key means to longitudinally slide into the operative position in said recess, said key means being rotatable in said recess when registered therein and engaging one end of said recess for conjoint movement of the yoke and shaft.

2. In a yoke and rocker shaft structure for centrifugal governors, the combination with a strap member bifurcated at one end to form a yoke and having said bifurcated end arcuately formed to provide a bearing portion and curled at the other end for socket formation, the said opposite end terminating short of engagement to form a restricted throat, the socket having an arcuate recess therein communicating at one end with the throat, a rocker shaft mounted in said socket and having rotatable movement therein, and key means carried by the shaft and having a cross sectional diameter smaller than the throat to permit said key means to longitudinally slide into operative position in said throat and rotatable in the recess when registered therein, said key engaging one end of said recess for conjoint movement of the strap and shaft.

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