

Patented Nov. 14, 1911.



UNITED STATES PATENT OFFICE.

ALBERT GUENTHER, OF MOUNT HOREB, WISCONSIN.

AUTOMATIC CUT-OFF GOVERNOR.

1,008,642.

Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed June 9, 1910. Serial No. 565,963.

To all whom it may concern:

Be it known that I, ALBERT GUENTHER, a citizen of the United States, residing at Mount Horeb, in the county of Dane and State of Wisconsin, have invented a new and useful Automatic Cut-Off Governor, of which the following is a specification.

This invention relates to that class of steam engines in which the cut off is effected by a governor which is so connected to the valve gear as to vary the throw of the valve rod, and thus reduce or increase the steam supply according to the speed of the engine, an acceleration of speed resulting in a reduction of the steam supply, and a drop in the speed increasing the steam supply.

It is the object of the invention to provide a simple and improved mechanism for effecting the above described operation, and to this end, the invention consists in a novel construction and arrangement of parts to be hereinafter described and claimed.

The invention is illustrated in the accompanying drawing forming a part of this specification, in which drawing—

Figure 1 is an elevation of the mechanism. Fig. 2 is a vertical section on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 1. Fig. 4 is an elevation of a modification.

Referring more particularly to the drawing, 5 denotes a valve chest containing an ordinary slide valve which controls the steam supply to the cylinder of the engine (not shown). The crank shaft of the engine is shown at 6, and on said shaft is mounted an eccentric 7 for operating the valve gear. To the strap of the eccentric is connected a reach rod 8. On the valve chest is rigidly secured a bracket 9 to which is pivoted at 10, to swing in a vertical plane, one end of an arm 11 which is pivotally connected at its opposite end, as indicated at 12, to a link block 13. This block is slidably mounted in a link which is formed of two arcuate bars 14 which are spaced apart to receive the block, said block being free to slide therebetween. The curvature of the link bars is an arm the center of which is the pivot 10. At 15 is indicated the valve rod of the engine. To the outer end of this rod is connected an A-shaped frame 16 to the apex of which the link is connected. Between the two bars forming the link, at the upper end thereof, is mounted a block 17, from one side of which block projects a pin 18 which

extends into an eye at the apex of the frame 16. Between the link bars 14, at their lower ends, is secured an arm 19, said arm depending from the link a suitable distance, and being connected at its lower end to the outer end of the reach rod 8. The block 17, and the arm 19, serve to space the bars 14, and bolts or other fastening means passing through said parts securely connect the same. Mounted on the bed or frame of the engine, in any suitable manner, is an upright tubular post 20 in which is rotatably mounted a sleeve 21. The lower end of this sleeve projects from the lower end of the post, and on said projecting end is fixed a bevel gear 22 which is in mesh with a similar gear 23 on a shaft 24 carrying a belt pulley 25, said pulley being belted to any moving part of the engine. The post 20 is formed with an arm 26 carrying a bearing sleeve 27 which supports the shaft 24. The sleeve 21 extends from the top of the post 20, and carries at its upper end a pair of diametrically opposite, outwardly extending arms 28, to the extremities of which are pivoted, as indicated at 29, bell crank levers. One of the arms 30 of each of said levers carries governor balls or weights 31, and the other arms 32 of said levers are connected to one end of links 33, the other ends of which links are connected to a collar 34 mounted on a rod 35 extending through the sleeve 21, and slidably mounted therein. By this connection between the levers carrying the governor balls, and the rod, the latter is made to slide upwardly and downwardly in the sleeve when the governor balls move outwardly or inwardly. The arms of the bell crank levers which carry the governor balls are connected by a coiled spring 36 which opposes their outward movement. The lower end of the rod 35 depends from the sleeve 21 a suitable distance, and is threaded through a lug 37 carried by the arm 11 on one side thereof, whereby a connection between said arm and the rod is made. This connection is adjustable as the rod screws through the lug. A lock nut 38 is provided for locking the parts after the adjustment has been made. To the lower end of the rod is fitted a hand crank 39 to facilitate its adjustment.

In operation, the link is oscillated through the connection between the same and the eccentric 7, the center of oscillation being the pivot 12, and as this pivot is carried by

the block 13, it will be noted that the center of oscillation may be shifted by swinging the arm 11 which carries the block 13. By reason of the connection of said arm with the rod 35, the shifting of the block in the link is automatically effected by the governor mechanism. Thus, when the governor balls 31 spread by reason of an increase in the speed of the engine, the arm 11 is swung upwardly, and the block 13 is elevated in the link, thus elevating the center of oscillation of the link, and thereby decreasing the throw of the valve stem 15, and consequently reducing the steam supply. If the speed of the engine decreases, the governor balls are swung inwardly by the spring 36, and the arm 11 is swung downwardly, thus lowering the center of oscillation of the link, and increasing the throw of the valve stem to increase the steam supply. The closer the center of oscillation approaches the point of connection between the link and the frame 16, the shorter will be the throw of the valve stem, and, the greater the distance between the center of oscillation and the point of attachment, the greater will be the throw of the valve stem. The link and the arm 19 constitute a lever, the fulcrum of which is the pivot 12, this fulcrum being adjustable as already described for the purpose of varying the length of the swing of that end of the lever to which the frame 16 is connected.

The mechanism herein described can be applied to reversing engines, and it operates equally as well when the engine is running forward as when it is running backward. The speed can be changed while the engine

is in motion or under load by loosening the lock nut 37, and raising or lowering the block 13 by turning the rod 35 manually. The mechanism can also be applied to any steam engine, either traction or stationary, having a slide cut off valve, the supporting frames being suitably modified to fit the particular engine to which the mechanism is to be applied.

In the modified form of mechanism illustrated in Fig. 4 the frame 16 is rigidly mounted on the engine bed or frame, and has pivoted at its apex as indicated at 38, a lever 39, said lever being pivoted intermediate its ends. One end of the lever is pivotally connected to the block 17 of the link 14, and the other end of the lever is connected to the valve rod 15. The link is operated by the eccentric 7 as in the first instance, and the link block is also retained.

What is claimed is:

In combination with a valve rod, a frame attached thereto, a link pivoted to the frame at a fixed point upon the frame, means for swinging the link, an arm pivotally supported, a block pivoted to said arm and slidably mounted in the link, a shaft adjustably attached to the arm, and an automatic governor connected with the arm through the shaft and resiliently supporting the block in the link.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALBERT GUENTHER.

Witnesses:

I. FOSSHAGE,
NORA EVANS.