(No Model.)

2 Sheets—Sheet 1.

G. VYNE.

STEAM ENGINE.

No. 514,396. Patented Feb. 6, 1894.

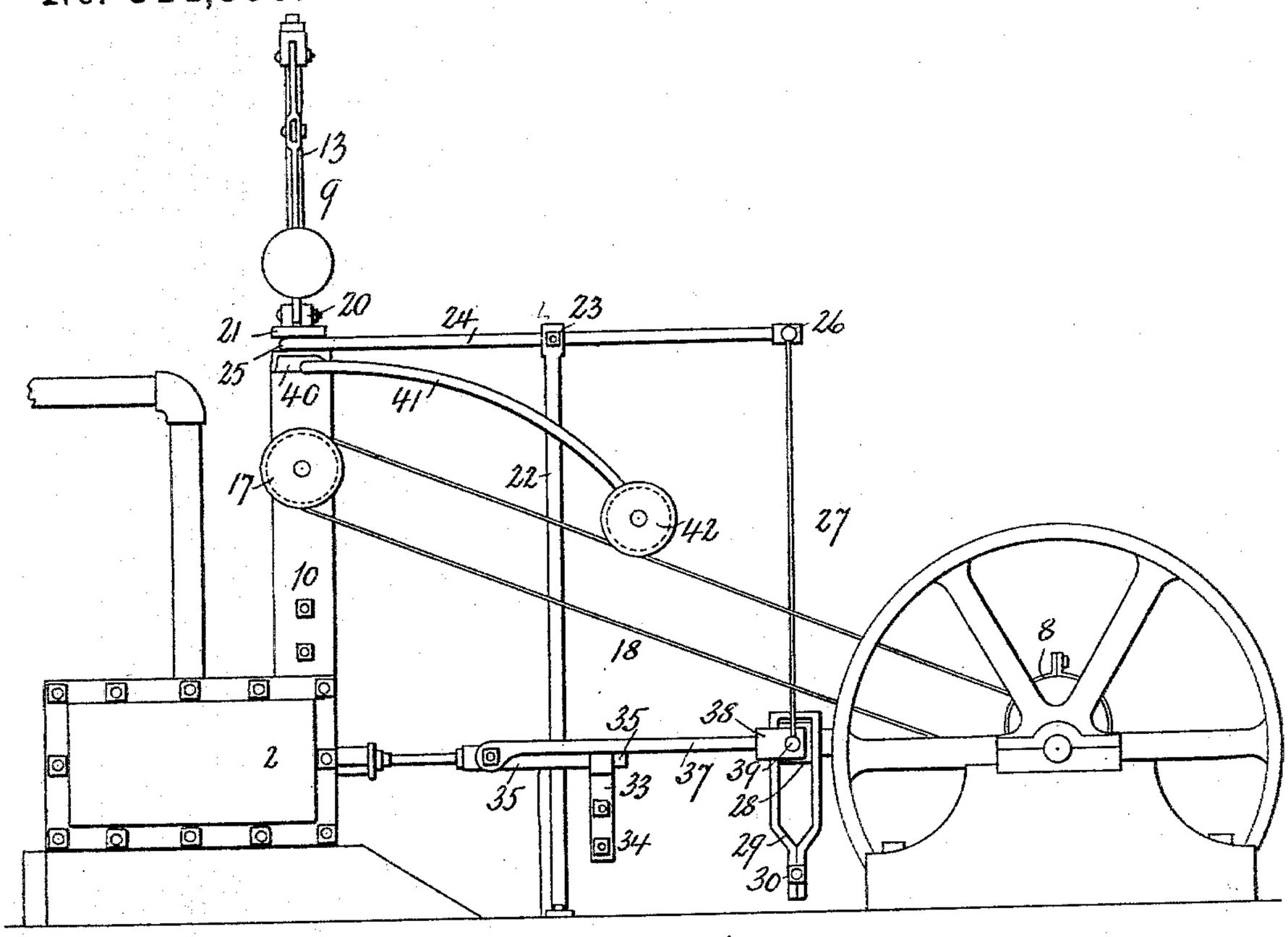

Fig. 1.

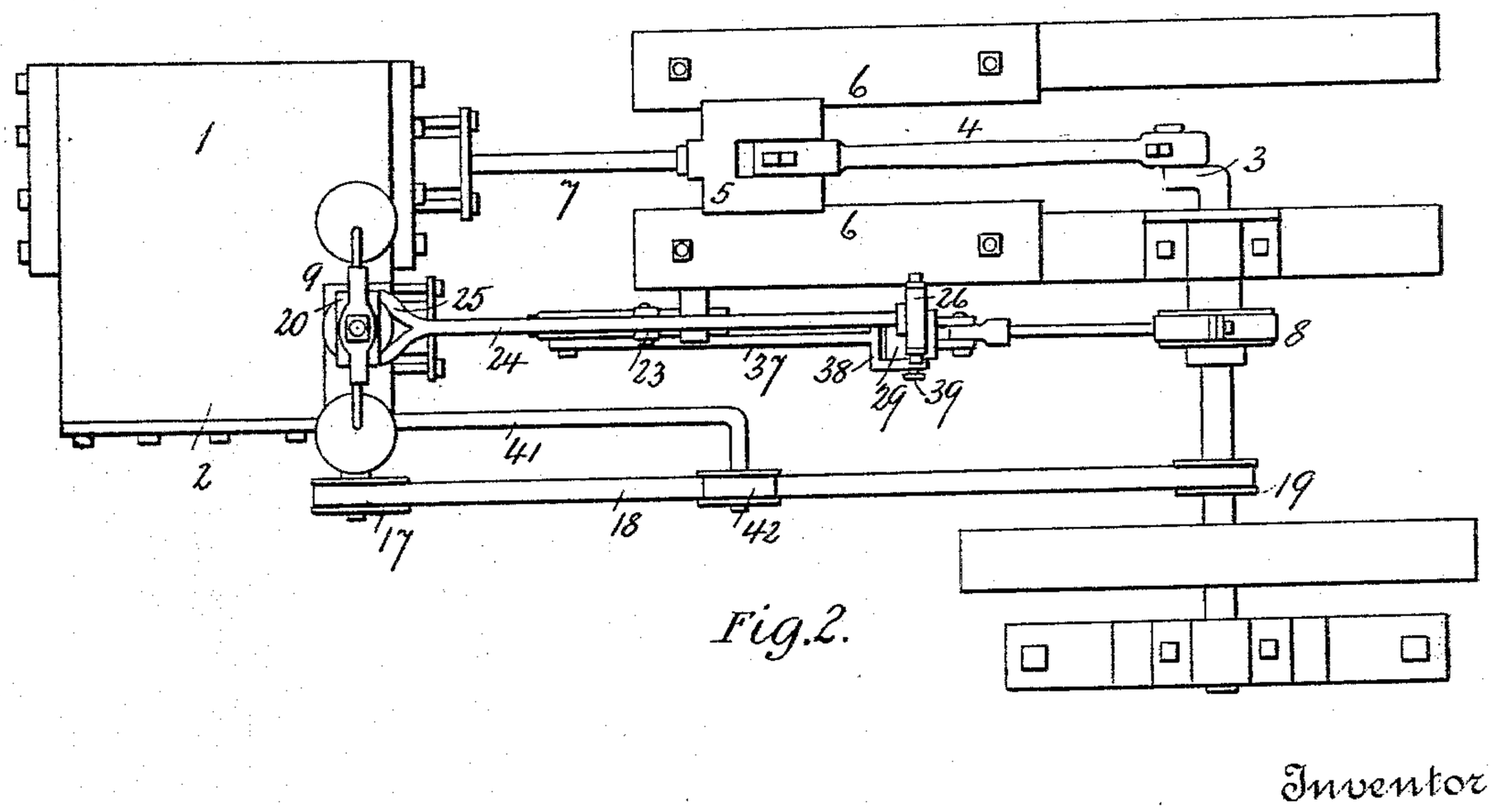

Fig. 2.

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(No Model.)

2 Sheets—Sheet 2.

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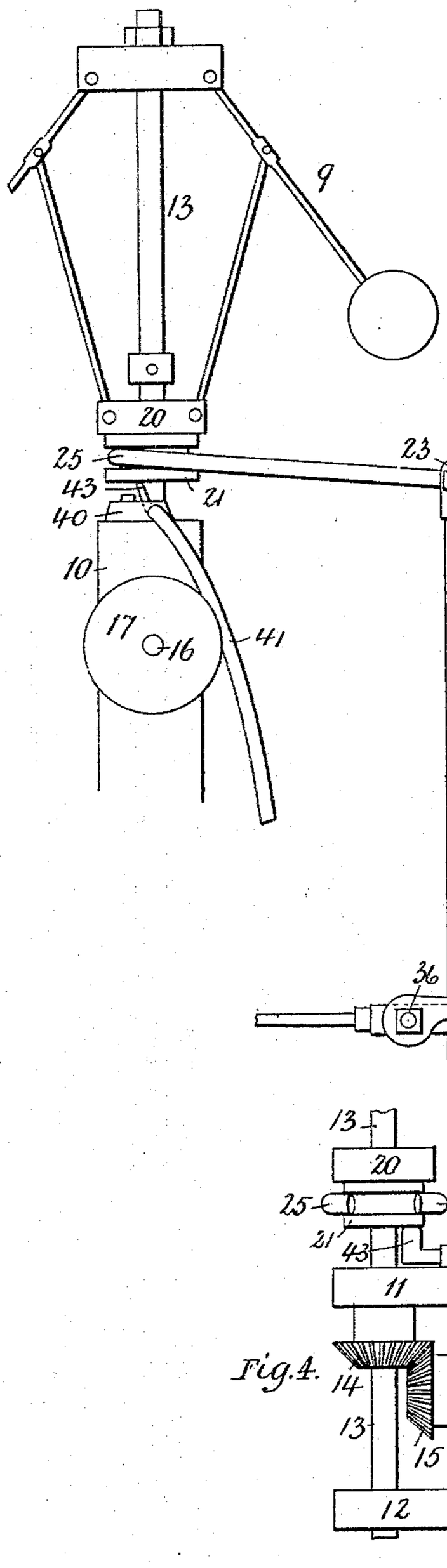

Fig. 3.

Fig. 4.

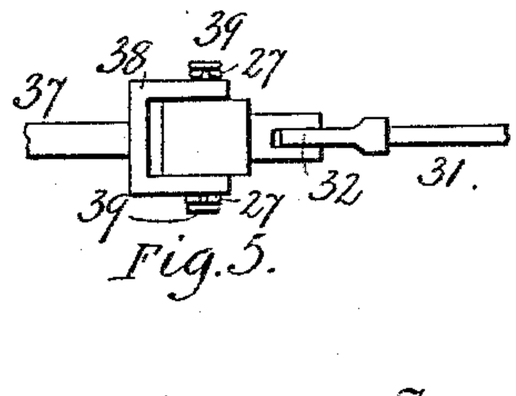

Fig. 5.

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UNITED STATES PATENT OFFICE.

GERRIT VYNE, OF WILKESBOROUGH, NORTH CAROLINA.

STEAM-ENGINE.

SPECIFICATION forming part of Letters Patent No. 514,396, dated February 6, 1894.

Application filed May 12, 1893. Serial No. 473,990. (No model.)

To all whom it may concern:

Be it known that I, GERRIT VYNE, a citizen of the United States, residing at Wilkesborough, in the county of Wilkes and State of North Carolina, have invented certain new and useful Improvements in Steam-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to steam engines, and has for its object to provide new and improved mechanism for automatically regulating the supply of steam to the engine to suit the work that is being performed; and auxiliary mechanism which will operate to keep the engine under regular speed, when from any cause the governor belt becomes broken or unshipped from its pulley.

My invention also has for its object to dispense with the valves ordinarily employed in connection with the governor, and to simplify the construction and operation of the above mentioned devices employed for such regulation.

To these ends my invention consists in the construction, relative arrangement and operation of the several parts constituting my invention, all of which will hereinafter fully and clearly appear from a reading of the following description, taken in connection with the accompanying drawings, in which—

Figure 1 illustrates in elevation a horizontal steam engine with my improvements applied thereto; Fig. 2 a plan view of the same; Fig. 3 a detail view enlarged showing in elevation the governor, eccentric and valve rods with my improvements thereon; and Figs. 4 and 5 are detail views enlarged of portions of the mechanism.

Like numerals of reference denote like parts in the several figures of the drawings.

The reference numeral 1 denotes the cylinder, 2 the steam chest, 3 the crank, 4, the connecting rod, 5 the head, 6 the guides for said head, 7 the piston rod, 8 the eccentric and 9 the governor: these parts being of common construction. To the top of the steam chest 3, is secured a standard 10, having arms 11, 12, in which is journaled the vertical spindle 13 of the governor, which is of the ball type, and rotated by means of a gear 14 on the spindle 13 which meshes with a gear 15 on a horizontal shaft 16 journaled in the standard 10: said shaft having on its outer end a sheave 17 which is connected by means of a belt 18 with another sheave 19 on the main shaft. Below the sliding cross-head 20 of the governor is arranged a grooved circular block 21 which is secured to said cross-head and is movable on the spindle.

22 is a standard or post secured to the bed of the engine, and provided with a fork 23 at its upper end in which is pivotally mounted a lever bar 24. This bar terminates at one end in two jaws 25 which are seated in the groove of the block 21 by which latter the said lever bar is actuated as will be presently explained. On the other end of the bar 24 is a cross-head 26, at each side of which are pivotally secured two depending rods 27. These rods are pivotally secured at their lower ends to a head 28 movably mounted in a guide frame 29 which is pivoted at its lower end at 30 to the side of the guide bed as shown, and the upper end of the frame has in consequence a rocking motion imparted by the action of the eccentric rod 31 which is pivotally secured at 32 to said frame and at its other end to the eccentric 8.

33 is a guide standard secured to the guide bed at 34 having a square opening to receive the outer end of the valve rod 35 which is made square to fit said guide standard to prevent the turning of the valve. Pivotally connected at 36 to said valve rod is a connecting rod 37 which has at its outer end a yoke 38 which spans the guide frame 29 and is pivotally connected to the block 28 by means of pins 39 to which are also secured the lower ends of the rods 27.

On the top of the standard 10 is secured a box 40 which serves as a bearing for the inner end of an arm 41 which carries at its outer end a friction pulley 42 having contact with the governor belt. The journal of the arm 41 extends beyond the inner side of the box and is laterally bent to form a trip 43 which engages the under side of the block 21, and operates in a manner to be presently explained.

The operation is as follows: The steam is turned on and the engine set in motion, and the centrifugal action causes the governor balls to move outward and raise the block,

which latter carries upward therewith the inner end of the lever arm. The other end of said arm is thereby depressed and operates through the rods 27, to move the head 28 downward in its guide, which carries therewith the outer end of the valve connecting rod and shortens the leverage between it and the eccentric rod as will be understood by reference to Fig. 3 of the drawings. The stroke of the valve rod is thus shortened, and in consequence thereof the slide valve will operate to partly open the ports and the entrance of steam into the cylinder is thereby regulated, and the movement of the engine governed.

In the event of the pulley 42 becoming unshipped from the governor belt or in the event of the breakage of the latter the arm 41 will drop and raise the trip 43 which will in turn raise the block 21 and consequently the lever arm, which latter will operate the mechanism to regulate the supply of steam as above stated.

By my invention the movement of the slide valve is increased or diminished, causing its own automatic cut off and thereby causing the engine to run steady under all stages of labor; and having no obstruction between the boiler and the engine, the power will increase by reason of a steady flow of steam, thereby lessening the cost of fuel. In the event of the breakage of the governor belt, the governor balls are kept distended as will be readily understood and the engine will be prevented from "running away."

I claim—

1. In a steam engine, the combination of an eccentric and its rod, a pivoted guide frame secured to said rod, a block movable in said frame, a connecting rod between said block and the guided slide valve rod, a governor, a lever bar centrally pivoted and loosely connected at one end to said governor, and at its other end to the block, all substantially as and for the purposes set forth.

2. In a steam engine, the combination of an eccentric and its rod, a guide frame connected to said rod, the valve rod having at its inner end a block moving in said guide, a governor, intermediate mechanism between said governor and block, a governor belt, a friction pulley normally resting on said belt and having an arm provided with a trip for distending the governor balls, substantially as and for the purposes set forth.

3. In a steam engine, the combination of an eccentric and its rod, a pivoted frame secured to said rod, a block movable in said frame, the slide valve and its rod, a connecting rod between said slide valve rod and block, a ball governor having a grooved block thereon, a centrally pivoted lever having jaws at one end which engage said grooved block, and at the other end rods connecting with the slide block, a governor belt, a pulley normally resting thereon and connected with a pivoted arm, and a trip on the said arm adapted to engage the under side of the grooved block, all substantially as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GERRIT VYNE.

Witnesses:

D. R. EDWARDS,

CALVIN J. COWLES.