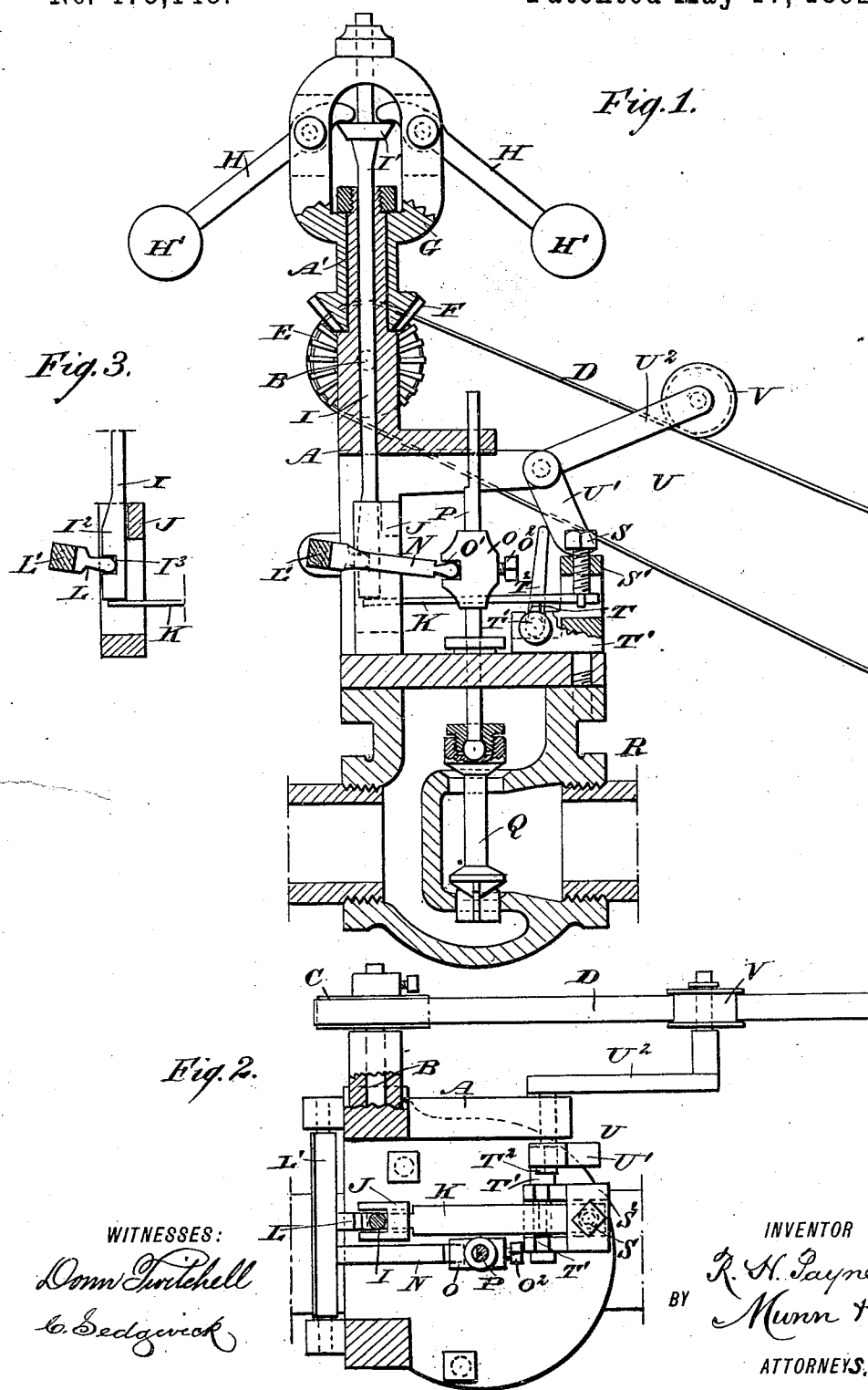


(No Model.)

R. H. PAYNE.
STEAM ENGINE GOVERNOR.

No. 475,148.

Patented May 17, 1892.



WITNESSES:

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RICHARD H. PAYNE, OF AQUONE, NORTH CAROLINA.

STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 475,148, dated May 17, 1892.

Application filed July 30, 1891. Serial No. 401,133. (No model.)

To all whom it may concern:

Be it known that I, RICHARD H. PAYNE, of Aquone, in the county of Macon and State of North Carolina, have invented a new and Improved Steam-Engine Governor, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved steam-engine governor which is simple and durable in construction, very effective in operation, and arranged to actuate the valve at the slightest variation of speed, according to an increasing or diminishing load or steam-pressure.

The invention consists of a governor-stem controlled by balls and connected with a pivoted arm carrying the valve-stem.

The invention further consists of a bell-crank lever carrying at one end a pulley resting on the driving-belt, the other arm of the lever being adapted to engage an arm held on a rocking shaft controlling a spring supporting the governor-stem.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter fully described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement. Fig. 2 is a sectional plan view of the same, and Fig. 3 is a sectional side elevation of the governor-stem and its connection with the rocking arm.

The improved steam-engine governor is provided with a suitably constructed frame A, in which is mounted to turn in suitable bearings the driving-shaft B, carrying on its outer end the pulley C, over which passes the usual driving-belt D, operated from the main driving-shaft of the engine.

On the inner end of the governor driving-shaft B is secured a bevel gear-wheel E in mesh with a like gear-wheel F, secured on the ball-frame G, mounted to turn on the hollow spindle A', formed or secured on the main frame A. The ball-frame G contains the usual pivoted arms H, carrying at their outer ends the balls H', and pressing with their in-

ner ends onto a disk I', secured on the governor-stem I. The latter passes through the hollow spindle A' and part of the frame A, and has its lower square end I² fitted to slide in a bearing J, secured on the governor-frame A.

The extreme lower end of the governor-stem I is supported on the free end of the spring K, which holds the stem in the proper position and permits the stem to slide up and down, according to the action of the balls. In the square part I² of the stem I is formed a transverse recess I³, (see Fig. 3,) engaged by a short arm L, projecting from a rock-shaft L', extending transversely and mounted to turn in suitable bearings on the governor-frame A. On the rock-shaft L' is secured a longer arm N, engaging with its free end a transverse recess O', formed in a collar O, held adjustably by means of a set-screw O² on the valve-stem P, carrying the valve Q, adapted to be seated in the valve-casing R. The outer end of the spring K is engaged by a screw S, screwing in a frame S', supported on the governor-frame A opposite the bearing J, and the under side of the spring K is engaged between its free end and the screw S by a projection or lug T, formed on a shaft T', extending transversely and mounted to turn in suitable bearings in the frame S'.

On the outer end of the shaft T' is secured an upwardly-projecting arm T², adapted to be engaged by the arm U' of a bell-crank lever U, pivoted on the governor-frame A. The other arm U² of the bell-crank lever U carries on its outer end a pulley V, resting on the governor driving-belt D, as is plainly shown in Fig. 1.

The operation is as follows: When the several parts are in the position illustrated in Fig. 1, the valve Q is open and the engine operates at a normal rate of speed. Now when the speed of the engine increases the balls of the pivoted arms H fly outward, and the latter with their inner ends act on the disk I', thus moving the governor-stem I downward in its bearings. The lower square end of the stem I by being connected with the short arm L of the rocking lever L' imparts a turning motion to the latter, so that the long arm N swings downward and by its connection with the

collar O moves the stem P downward, so that the valve Q closes, and if the speed still increases finally seats the valve in the valve-body R, thereby shutting off the steam.

5 When the speed has diminished to a normal rate, the pivoted arms H swing inward, caused by the weight of the balls, so that the free end of the spring K, acting on the valve-stem I, forces the latter upward to its former position,

10 causing at the same time a turning of the shaft L' in an opposite direction, so that the long arm N swings upward and carries along the valve-stem P, thus opening the valve Q. It will be seen that when the speed diminishes the arms H swing inward and permit the valve-stem I to rise by the action of the spring K, so that the valve Q is opened to its full extent and a full head of steam is admitted to the steam-chest of the engine. In case the

20 driving-belt D breaks or is thrown off accidentally then the pulley V loosens its support and the bell-crank lever U, with its arm U², swings downward, so that the other arm U', in pressing on the arm T², causes the shaft T' to turn, so that the lug T is moved from under the spring K, which latter consequently by its free end falls downward. The governor-stem I then drops and by the action above described the valve P closes of its own accord,

30 thus shutting off the steam.

It will be seen that by the difference in the length of the arms L and N the slightest movement of the governor-stem I imparts considerable movement to the valve-stem P, so that the valve Q by the slightest variation of speed of the engine opens or closes, and thus perfectly governs the admission of steam to the engine.

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Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

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1. The combination, with the downward-closing valve having an upward-projecting stem P, provided with an adjustable slide O, having a notch O', of the governor-stem I, parallel with the stem P and projecting at its lower end past the upper end of the valve-stem and having a notch at its lower end, a spring supporting the governor-stem, a transverse rock-shaft having two parallel arms L N, extending in the same direction and engaging the respective notches, and the rotary governor-frame provided with the pivoted weighted arms engaging the governor-stem at

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their inner ends, substantially as shown and described.

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2. The combination, with the valve-stem, vertical governor-stem, and governor-arms, of a spring-arm extending under the lower end of the stem to support it in operative connection with the valve-stem and governor-arms, a bearing against which the outer end of the spring rests, a transverse shaft having a projection or cam engaging the underside of the spring between its ends to hold it in position, an upward-projecting arm, and a bell-crank lever adapted to engage the governor-operating belt at one end and having its downward-extending end adjacent to said upward-projecting arm to throw it and release the spring-arm upon the breakage of the belt, substantially as shown and described.

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3. A governor comprising the frame A, the parallel governor and valve stems I P, mounted to slide vertically thereon, a transverse rock-shaft L', having a short arm L, loosely engaging the lower end of stem I, and a longer arm N, loosely engaging the stem P, the rotary governor-frame G, having arms provided with balls and resting at their inner ends on a collar I' of the stem I, the vertical screw S, the spring-arm K, extending from the lower end of the screw under the lower end of stem P, the transverse shaft T', having a cam or lug T, holding the spring-arm up to the stem P and lower end of the screw and an arm T², and the angle-lever U, having a pulley or roller V to rest on the belt and having its lower arm U' engaging the arm T², substantially as shown and described.

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4. The combination, with the vertical governor-stem loosely connected with a valve-stem, of a vertical screw S, a transverse shaft T' between the screw and governor-stem, provided on its upper side with a cam or projection T and having an upward-projecting arm T², and the horizontal spring-arm K, crossing the projection and having its ends held thereby under the lower ends of the governor-stem and screw S, and the bell-crank lever U, having its upper arm provided with a pulley or roller to rest on the belt and its lower arm to engage the shaft-arm T² upon the breaking of the belt, substantially as shown and described.

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RICHARD H. PAYNE.

Witnesses:

CHARLES PERRY,
S. C. HEIGHWAY.