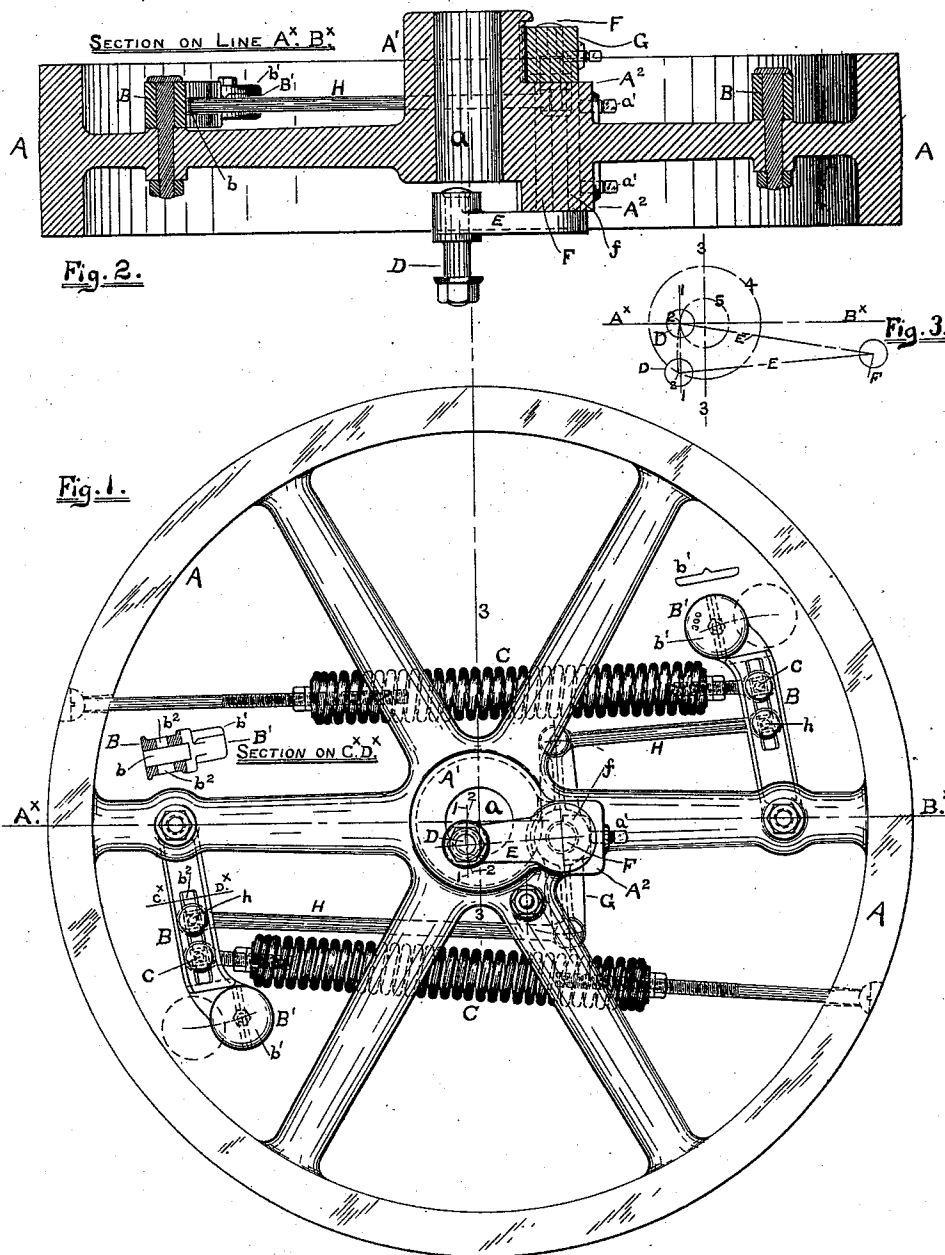


(No Model.)

W. O. WEBBER.
STEAM ENGINE GOVERNOR.

No. 466,475.

Patented Jan. 5, 1892.



WITNESSES:

Wm. Marks, Jr.
J. D. Otto

INVENTOR

W. O. Webber

BY

Hallock & Halluck
ATTORNEYS.

UNITED STATES PATENT OFFICE.

WILLIAM O. WEBBER, OF ERIE, PENNSYLVANIA.

STEAM-ENGINE GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 466,475, dated January 5, 1892.

Application filed June 15, 1891. Serial No. 396,269. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM O. WEBBER, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Engine Governors; 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.

This invention relates to steam-engine governors, and particularly to that type of steam-engine governors wherein the governing apparatus is placed in the fly-wheel of the engine; and it consists in certain improvements in the construction thereof, as will be hereinafter fully set forth, and pointed out in the claims.

Figure 1 is a side elevation view of the fly-wheel containing my improved governor. Fig. 2 is a sectional view taken on the line A^x B^x, the main spring C not being shown. Fig. 3 is a diagram showing the movement of the valve-moving crank-pin D.

A represents a fly-wheel having the hub A', with shaft-opening *a* and the boss A².

B B are the weight-arms, and B' are the weights.

C C are the main centripetally-acting springs, which are connected with the weight-arms at *c*.

D is the eccentric crank-pin with which the valve-rod engages.

E is the crank-arm carrying the eccentric crank-pin D.

F is the rock-shaft journaled in the boss A².

G is the rock-arm connected with the rock-shaft F.

H H are links connecting the rock-arm G with the weight-arms B B at *h*.

It will be seen that as the weight-arms are thrown out or in by the movement of the fly-wheel the rock-arm G will be vibrated through the connecting-links H H, connecting with said weight-arms, and that thereby the rock-shaft F will be rocked, the crank-arm E will be rocked, and the crank-pin D moved in the arc of a circle. This arc is marked 2 2. The line 1 1, passing through the crank-pin D, represents the lead-line of the governor. The circle 4 represents the extreme path of the

crank-pin D and the circle 5 the inner path of that pin. It will be seen that the journal of the rock-arm G—that is to say, the rock-shaft F—is below or at one side of the center line A^x B^x. Therefore the arc 2 2 through which the crank-pin D moves will be nearer to the center line 3 3 at its intersection with the line A^x B^x than it will at any other point in its movement. The crank-pin D is carried toward the line A^x B^x when the weights B' B' move outwardly, and vice versa. Hence when the load is put upon the engine and the fly-weights move inwardly it will be seen that the engine increases its lead, because the center of the crank-pin D moves from the line 1 1 and the line 3 3 outwardly, while, on the other hand, if the load is decreased and the weights B' B' fly outwardly, the center of the crank-pin will be carried back toward the line 1 1 as it approaches the center line A^x B^x, and thereby the lead of the engine will be decreased.

In Fig. 1 there is shown a small section figure of detail taken on the line C^x D^x, where it will be seen that the arms B are formed with two slots or openings through them, *b* and *b*². The parts C and H, which connect with these weight arms, enter the slot *b* and the pivot-pins *c* and *h* pass through the slot *b*², and the heads of these pins have their bearings on the outer sides of the weight-arms. This brings the bolt of the weight-arms upon the parts moved by them centrally in the arm.

These weight-arms are cast in the form shown and require no finishing before using, except to prepare the journal-opening of the inner end of the arm. The weights B' are cast solid with the arm, but they are added to by cap-weights *b'*, which are bolted to them. The weight of these cap-weights may be varied in order to adjust the governor in degree of speed—as, for example, on the right of Fig. 1 the cap-weight is shown with 300 marked on it, which indicates that the weight is intended to regulate the engine at three hundred revolutions per minute. If it is desired to increase or decrease the speed of the engine, these three hundred weights will be removed and the weight of proper weight will be substituted—as, for instance, a weight marked 275 or 325—according as wanted. This obviates the necessity of changing the tension

of the spring C in order to change the speed of the engine. The engine will be sent from the shops perfectly adjusted with cap-weights designed for, say, three-hundred-revolution movement, and if it is found, when the engine is put to use, that it should run three hundred and twenty-five the cap-weights would be removed and three hundred and twenty-five cap-weights would be substituted for the three hundred, and the engine would run at three hundred and twenty-five revolutions and no change of the tension of the spring C would be required.

What I claim is—

1. In a steam-engine governor, the combination, with an eccentrically-placed valve-moving crank-pin, of a crank-arm carrying said pin, which is moved by the action of the governor-weights and is journaled eccentric to the shaft and so far to one side of the center line $A^x B^x$ which cuts the lead-line 1 1 at right angles that when the said crank-arm is moved by the inward movement of the governor-weights the said pin will move away from said line 1 1 on the opposite side thereof from the center of motion of said crank-arm and thereby increase the lead of the valve.

2. In a steam-engine governor, the combination, with the centrifugally-acting weight-arms and the centripetally-acting springs connected with said weight-arms, of a rock-arm journaled eccentric to the main shaft and to one side of the center line $A^x B^x$ which is at right angles to the lead-line 1 1 and connected to the weight-arms by suitable links, a crank-arm on said rock-shaft, and a crank-pin on said crank-arm for connecting with the valve-rod and which is eccentric to the main shaft.

3. In a steam-engine governor, the combination, with an eccentrically-placed valve-moving crank-pin, of a crank-arm carrying said pin, a rock-shaft carrying said crank-

arm, which is journaled eccentric to the main shaft and at one side of a center line $A^x B^x$ which cuts the lead-line 1 1 at right angles, a cross-arm on said rock-shaft, weight-arms, springs resisting the outward movement of said weight-arms, and links connecting said weight-arms with the opposite ends of said cross-arm.

4. In a steam-engine governor, the combination, with an eccentrically-placed valve-moving crank-pin and a crank arm carrying said pin, of a rock-shaft carrying said crank-arm, which is journaled eccentric to the shaft and so far to one side of a center line $A^x B^x$ which cuts the lead-line 1 1 at right angles that the crank-pin will move outwardly away from the lead-line as it moves away from the line $A^x B^x$ and thereby increases the lead of the valve, and weight-arms connected with said rock-shaft so as to rock the same when said weight-arms are moved inwardly or outwardly.

5. In a steam-engine governor, the combination, with the links H H and springs C C and the pivot-pins c and h , of weight-arms having a slot b to receive the eye ends of said links and springs and a slot b^2 at right angles to the slot b to receive the pivot-pins c and h .

6. In a steam-engine governor, the combination, with the weights B' , of removable and changeable cap-weights b' , which are secured upon the weights B' .

7. In a steam-engine governor, the combination, with a weight-arm B and weight B' , cast in one piece, of a cap-weight b' , detachably secured to said weight.

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

WILLIAM O. WEBBER.

Witnesses:

JNO. K. HALLOCK,
WM. P. HAYES.