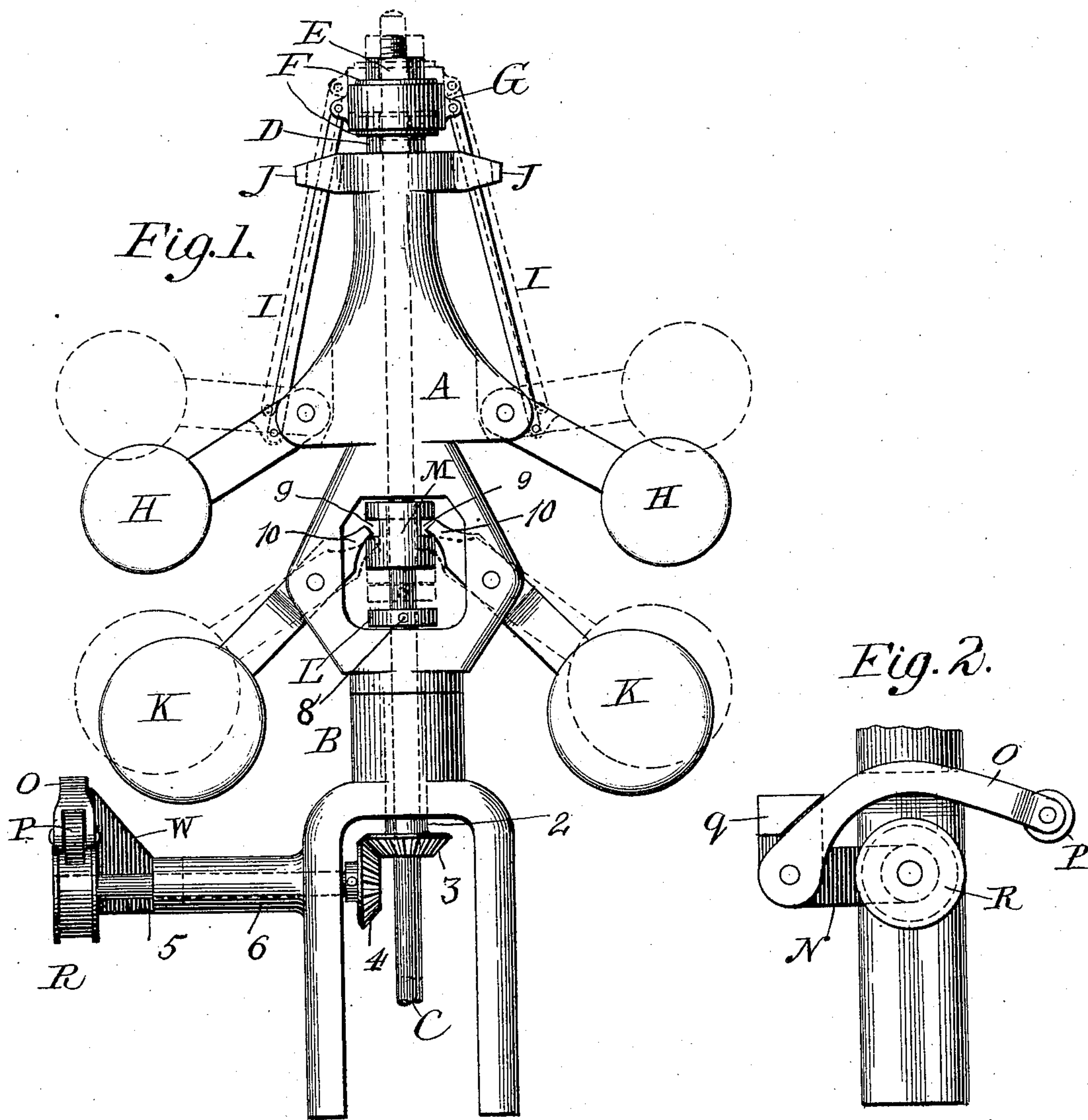


(No Model.)

W. R. CARMICHAEL.  
STEAM GOVERNOR.

No. 574,710.

Patented Jan. 5, 1897.



Witnesses:

James R. Cole  
Simon C. Roach

*Inventor.*

Warren R Carmichael



# UNITED STATES PATENT OFFICE.

WARREN R. CARMICHAEL, OF LE ROY, WEST VIRGINIA.

## STEAM-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 574,710, dated January 5, 1897.

Application filed July 22, 1896. Serial No. 600,179. (No model.)

*To all whom it may concern:*

Be it known that I, WARREN R. CARMICHAEL, a citizen of the United States, residing at Le Roy, in the county of Jackson and State of West Virginia, have invented a new and useful Steam-Governor, of which the following is a specification.

My invention relates to improvements in steam-governors, and has for its object the provision of means by which the engine may be shut down in case the governor-belt breaks or slips off or the governor stops from any cause, or to quickly stop said governor if belt breaks, and also to give even speed to the engine while working.

With these objects in view my invention consists of the details of arrangement and construction which will more fully appear hereinafter.

In the accompanying drawings, which form a part of this application, Figure 1 is a side elevation of the governor. Fig. 2 is a side view of crane-neck and pulley.

Like numerals and letters of reference indicate corresponding parts in both views.

Referring to the drawings, A is a revolving tree to which are pivoted the governor-balls H H and K K. C is a non-revolving shaft or rod passing down through the said tree A and casing B. The lower end 2 of the tree A is inserted in the casing B and revolves therein, the said lower end having a bevel-gear 3 keyed thereto and meshing with the corresponding gear 4, keyed to the inner end of the shaft 5, the said shaft being journaled in the tubular arm 6, constructed integral with the casing B. The upper end of the shaft C is threaded for the reception of the nuts D and E, which are held firmly against washers F F, which hold in place an inner band for band G to revolve about. The band G is connected with balls H H by rods I I, passing through points J J, connected to the tree A.

L is a circular disk fastened to the said shaft C by means of pin 8.

M is a drum loosely mounted on the shaft C, and has slots 9 situated diametrically opposite each other, which receive the ends of the governor-arms 10.

A band-wheel R is keyed to the outer end of the shaft 5, upon which it is to be operated,

and carries a suitable band (not shown) for operating the governor.

N designates a projecting arm cast solid with the frame B, and has pivoted thereto the crane-neck O, containing roller P at its free end.

A projection q extends over crane-neck O to prevent said crane-neck from being knocked back and away from its proper place.

The object of my invention is to make it perfectly safe to run steam-engines. When the balls H H rise and by means of the connecting-rods I I lift band G, which is held in place by nuts D and E, the rod C is raised and lets on the steam. The balls H H, being lighter, rise first, but as the speed increases the balls K K also rise and press the drum M down on the plate L, thus diminishing and regulating the supply of steam.

In case the governor-belt breaks or runs off or the governor stops from any cause the balls K K and H H drop, which draws the shaft C down and shuts off the steam. When the said belt breaks, the governor ordinarily would run awhile before stopping, and when they begin to slow up the balls H H would have a chance to hold rod C up and raise it somewhat higher when in its slow motion, which would let on a large head of steam just before they close down. To prevent this, I have provided a crane-neck O with roller P to ride governor-belt, so that when belt breaks or runs off crane-neck O will fall on band-wheel R and quickly stop the governor.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a steam-governor the combination of a tree A, the lower end of which is situated in the casing, B; the said casing, B; a shaft, C, passing through the tree, A, and the casing, B; a pinion keyed to the lower end of the said tree, A, and revolving therewith; a band, G, loosely mounted on the upper end of the shaft, C; governor-balls, H H, pivoted by means of arms to said tree, A; rods, I, attached to the band, G, and the said arms; screw-nuts, D and E situate on each side of band, G, and on the upper end of the shaft, C; a sliding drum, M, slots on each side thereof; a second pair of governor-balls pivoted by means of arms to

said tree, A, the ends of the said arms fitting in the said slots; a plate, L, keyed to the shaft, C; a gear, 4, keyed to the inner end of the shaft, 5, journaled in arm, 6; said arm, 6; a  
5 band-wheel, R, substantially as set forth.

2. In the herein-described device, the combination of a tree, A, revolving in casing, B; a tubular arm, 6, formed integrally with the casing, B; a shaft, 5, journaled in said arm; a  
10 gear, 4, keyed to the inner end of the said shaft; a band-wheel, R, keyed to the other end of

the said shaft, 5; a crane-neck, O; said crane-neck, O, adapted to fall upon band-wheel, R; a roller, P, in the bifurcated end of the said crane-neck, O; a shoulder, q, over pivoted  
15 end of said crane-neck, O, substantially as set forth.

WARREN R. CARMICHAEL.

Witnesses:

JAMES A. COLE,  
SIMON C. ROACH.