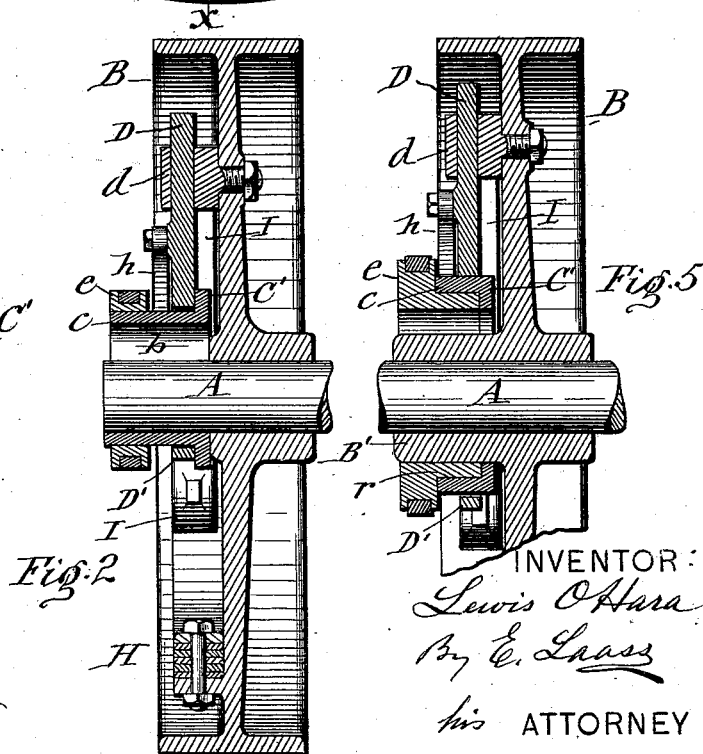
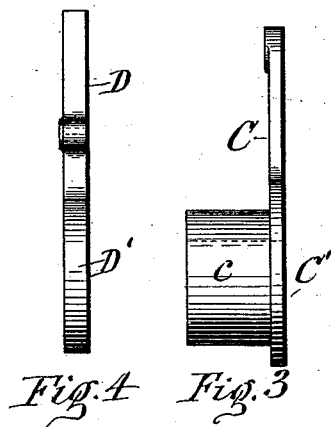
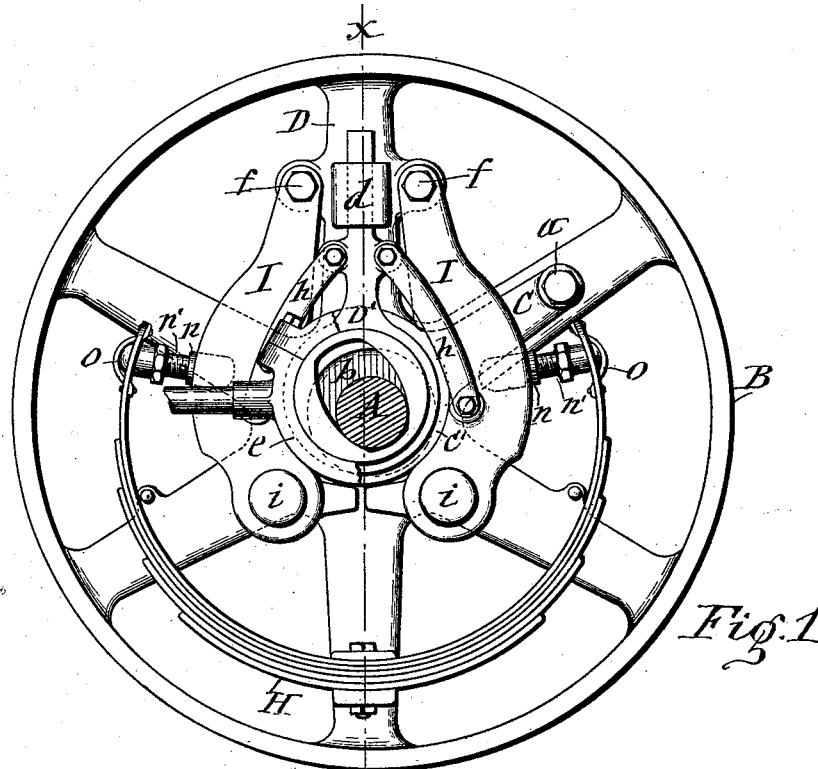


(No Model.)

L. O'HARA.  
CENTRIFUGAL GOVERNOR.

No. 522,382.

Patented July 3, 1894.



WITNESSES:

*C. C. Bonlinson.*  
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INVENTOR:

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*By E. L. Lantz*  
his ATTORNEY

# UNITED STATES PATENT OFFICE.

LEWIS O'HARA, OF AUBURN, NEW YORK.

## CENTRIFUGAL GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 522,382, dated July 3, 1894.

Application filed March 24, 1894. Serial No. 504,906. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS O'HARA, of Auburn, in the county of Cayuga, in the State of New York, have invented new and useful  
5 Improvements in Centrifugal Governors, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to the class of steam-  
10 engine governors in which a lateral movable eccentric is hung on the fly-wheel or driving pulley and carried toward and from concentricity with the shaft by means of gravitating levers pivoted to the wheel. And the in-  
15 vention consists in an improved construction of the component parts of the governor which is efficient and reliable in its operation.

The invention is illustrated in the annexed drawings, in which—

20 Figure 1 is a face view of a governor embodying my improvements. Fig. 2 is a transverse section on line—X—X—in Fig. 1. Fig. 3 is a detached side view of the pendulum. Fig. 4 is a detached side view of the radially  
25 movable arm, and Fig. 5 is a transverse section of a modification of the attachment of the eccentric to the pendulum and the arrangement of the governor in relation to the wheel and shaft.

30 Similar letters of reference indicate corresponding parts.

—A— represents the main driving shaft of a steam-engine and —B— the fly-wheel or main driving pulley which is fastened to said  
35 shaft.

—C— denotes the pendulum which is pivoted at one end to the side of the wheel —B— as shown at —a—. The free end of the pendulum is formed with a ring —C'— which sur-  
40 rounds the shaft —A— and has its internal diameter larger than the diameter of the shaft or elongated as shown at —b— to permit the pendulum to oscillate on its pivot. Said ring is formed with an annular hub —c— to the  
45 end of which is fastened in any suitable manner the eccentric —e— which actuates the valve in the steam-chest of the engine and thus controls the movement of the engine in the usual and well known manner. The oscillatory pendulum —C— serves to support the  
50 eccentric movable laterally toward and from concentricity with the shaft —A—.

—D— represents a radially movable arm which is formed at one end with a ring —D'— by which it rides on the ring —C'— and em-  
55 braces the hub —c— of the pendulum as shown in Fig. 2, of the drawings.

To one of the spokes of the wheel —B— is pivoted a sleeve —d— in which slides the free end of the arm —D—, which latter is thus  
60 guided longitudinally and at the same time permitted to swing in an arc to conform to the movements of the pendulum.

—I—I— represent centrifugal levers which are pivoted to the wheel at opposite sides of  
65 the sleeve —d— as shown at —f—f—in Fig. 1 of the drawings. The free ends of these levers are connected to the radially movable arm —D— by links or straps —h—h— pivoted to said parts to permit them to move  
70 freely when the engine is in operation.

The free ends of the levers —I—I— I make adjustable in their weight preferably by forming the same with pockets —i—i— for the re-  
75 ception of more or less weights.

The eccentric —e— may be attached either to the exterior of the hub —c— as shown in Fig. 2 of the drawings or in an annular rabbet —r— formed inside of the aforesaid hub as represented in Fig. 5 of the drawings. 80  
Said figures also illustrate the adaptability of placing the eccentric either over the shaft —A— or over the hub —B'— of the wheel. Hence I do not limit myself in these respects.

—H— represents a bow spring which is fast-  
85 ened at the center of its length to one of the spokes of the wheel. Between the ends of this spring and adjacent levers are interposed longitudinally adjustable pushers by means of which the spring presses the levers  
90 toward their normal positions and said pressure can be regulated by distending or contracting said pushers. I preferably form these pushers of nuts —n— stepped in sockets in the exteriors of the levers and contain-  
95 ing the screws —n'— which bear with their outer ends in recessed seats —o— attached to the ends of the spring as shown in Fig. 1 of the drawings.

In the operation of the engine, the centrifugal force exerted on the levers —I—I— causes  
100 them to swing outward to a greater or less distance according to the speed of the engine. The outward movement of said levers causes

them to draw inward the radially movable arm —D— which pushes the ring —c— of the pendulum —C— toward concentricity with the shaft —A— and consequently the eccentric —e— which is fastened to said ring is carried into a corresponding position in relation to the shaft. Said varying position of the eccentric regulates the stroke of the valve in the steam-chest of the engine.

10 It will be observed that in my improved governor, all the moving members are pivoted so as to obviate binding the same.

What I claim as my invention is—

1. The improved centrifugal governor consisting of a pendulum pivoted to the fly-wheel or pulley and having its free end astride the shaft and free therefrom, the eccentric attached to said pendulum to move with the same, centrifugal levers pivoted to the wheel 15 or pulley, a radially movable arm connected to the pendulum and links connecting the said arm to the centrifugal levers as set forth.

2. In a centrifugal governor, the oscillatory eccentric carried on the free end of a pendulum pivoted to the wheel, a sleeve pivoted to said wheel, a radially movable arm connected to the free end of the pendulum and, passing with its free end through the aforesaid sleeve, centrifugal levers pivoted to the wheel at opposite sides of the aforesaid sleeve, and links 25 connecting the aforesaid arm to the centrifugal levers as set forth.

3. In combination with the wheel, a pendulum pivoted to said wheel and formed at its 35 free end with a ring surrounding the shaft

and of a larger internal diameter to permit vibration of the pendulum, said ring being provided with an annular hub, a sleeve pivoted to the wheel, a radially movable arm formed with a ring embracing the aforesaid 40 hub and having its free end sliding in the aforesaid sleeve, the eccentric fastened to the hub of the pendulum, centrifugal levers pivoted to the wheel at opposite sides of the aforesaid sleeve and links connecting said 45 levers to the radially movable arm substantially as set forth and shown.

4. In combination with the wheel, a pendulum pivoted to said wheel and provided at its free end with a ring formed with an elongated eye surrounding the shaft and with an 50 annular hub, a radially movable arm formed at one end with a ring riding on said hub, a sleeve pivoted to the wheel and having sliding therein the free end of the aforesaid arm, 55 the eccentric fastened to the hub of the pendulum, centrifugal levers pivoted to the wheel at opposite sides of the sleeve, links connecting the aforesaid arm to said levers, and a bow-spring fastened at its center to one of 60 the spokes of the wheel, and longitudinally adjustable pushers interposed between the ends of the spring and adjacent centrifugal levers substantially as set forth and shown.

In testimony whereof I have hereunto signed 65 my name this 17th day of March, 1894.

LEWIS O'HARA.

Witnesses:

C. L. BENDIXON,

C. E. TOMLINSON.