(No Model.) 2 Sheets—Sheet 1.

D. P. DAVIS.

GOVERNOR FOR ENGINES.

No. 343,702. Patented June 15, 1886.

Fig. 1.

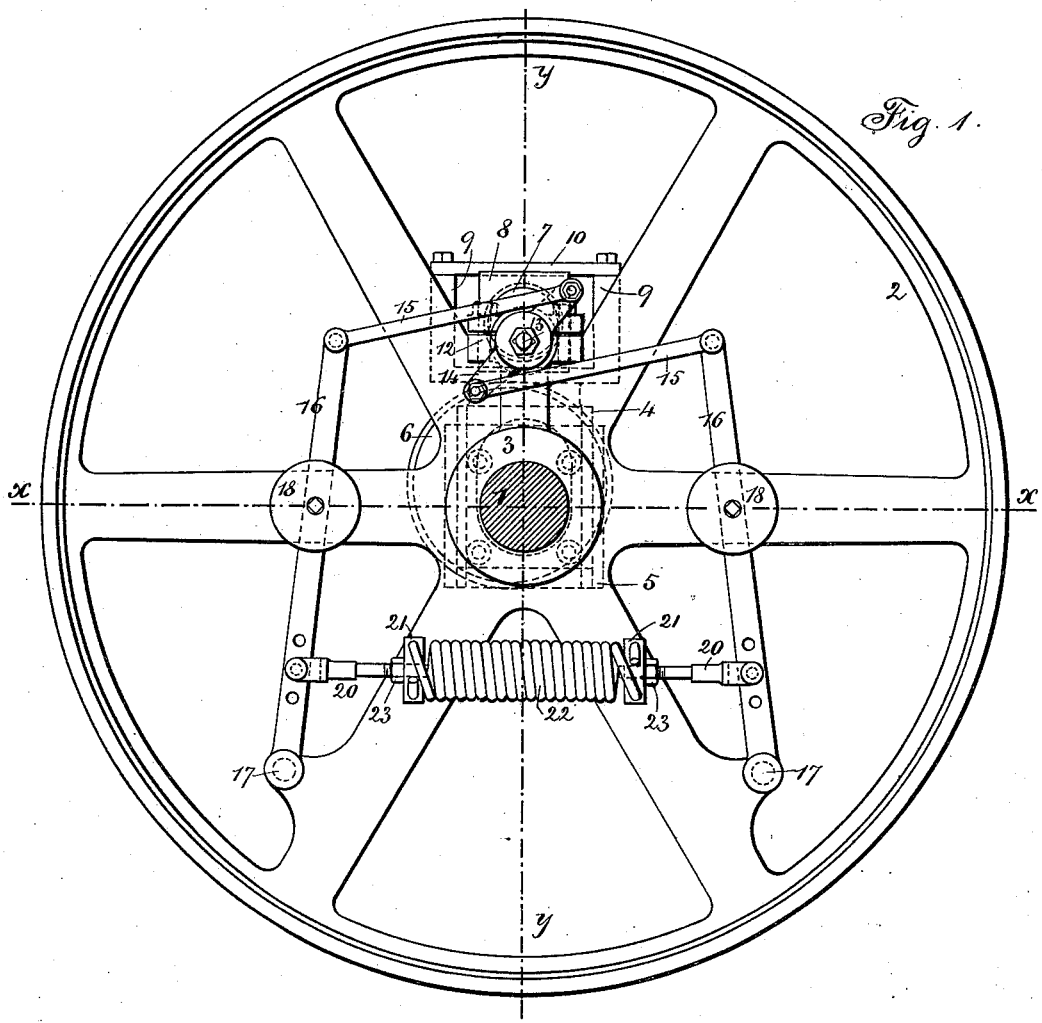
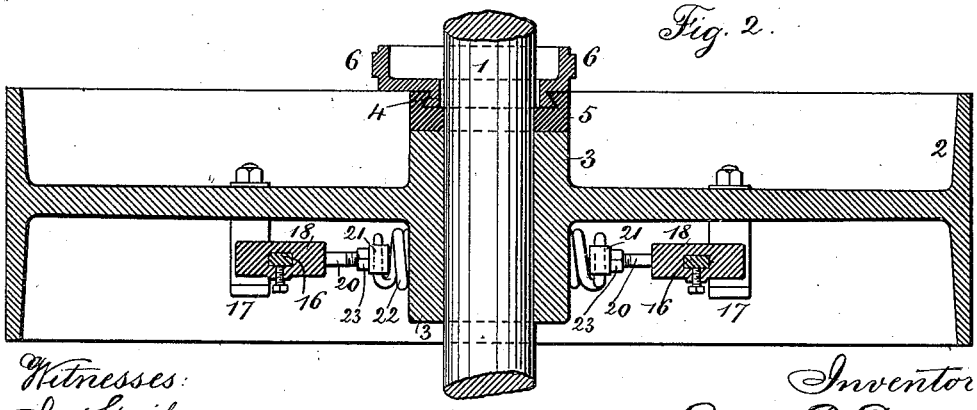


Fig. 2.



Witnesses:
I Stair
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Inventor:
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

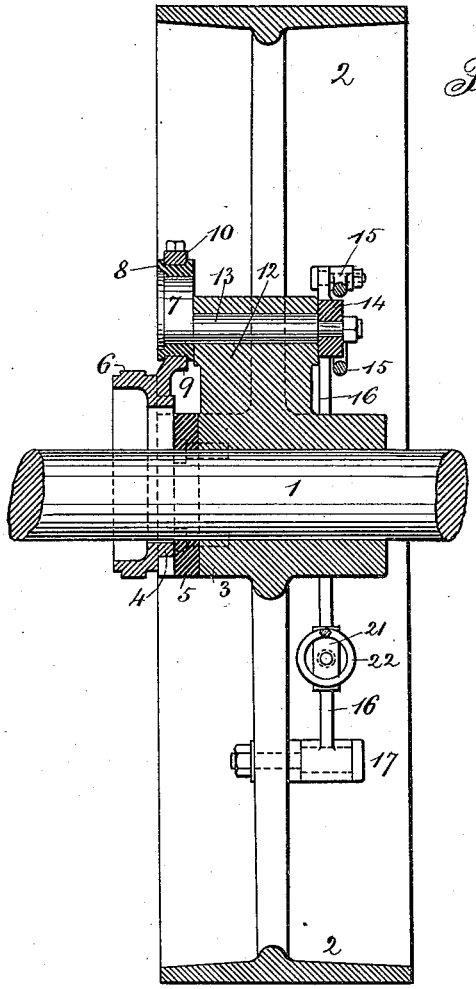
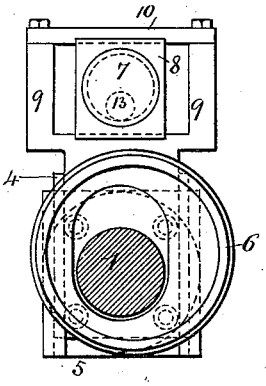


Fig. 4.



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Inventor:
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per Lemuel W. Serrell Atty

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

DAVID P. DAVIS, OF JERSEY CITY, NEW JERSEY, ASSIGNOR TO THE NEW YORK SAFETY STEAM POWER COMPANY, OF NEW YORK, N. Y.

GOVERNOR FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 343,702, dated June 15, 1886.

Application filed March 1, 1886. Serial No. 193,607. (No model.)

To all whom it may concern:

Be it known that I, DAVID P. DAVIS, of Jersey City, in the county of Hudson and State of New Jersey, have invented an Improvement in Governors for Engines, of which the following is a specification.

My present improvement is for shifting the eccentric by means of governor-balls upon the fly-wheel of the engine, and said improvement as distinguished from other devices having the same object in view relates to a slide within ways attached to the hub of the fly-wheel, and to which slide the main eccentric is connected, and there is a secondary eccentric or crank-pin acting upon a box that is recessed within an opening upon the eccentric slide. The governor-balls act upon the secondary eccentric or crank-pin to turn the slide and move the main eccentric laterally, and thereby give greater or less throw to the engine-valve.

In the drawings, Figure 1 is an elevation of my improvements. Fig. 2 is a section at the line *x x*. Fig. 3 is a section at the line *y y*, and Fig. 4 is a detached rear view showing the main eccentric frame, slide, slideways, and the secondary eccentric and box.

The engine or main shaft 1 and the fly-wheel or main pulley 2 are of ordinary construction, and this main wheel 2 has a hub, 3, to which is bolted the ways 5, that have side pieces at opposite sides of the main shaft, and forming a dovetailed recess for the slide 4, and upon this slide 4, or cast with it, is the main eccentric 6, from which an eccentric-rod passes to the valve of the engine in any desired manner. The slide 4 is extended in the form of a frame, 9, within which is received the box 8, that is of a width corresponding to the width of the opening in the said frame 9; but the length of this opening is greater than the length of the box 8, so that said box can slide transversely to a radial line passing through the center of the engine-shaft, and this box 8 is held in place by the bar 10, that is connected to and forms part of the frame 9. There is a bearing, 12, at one side of the hub 3, through which passes the axis 13 of the secondary eccentric or crank 7, which said secondary eccentric fills an opening in the center of the box 8. The other end of the axis 13 is squared and receives the cross-bar 14, to the ends of which are hinged the links 15, that pass to the governor-lever 16. These latter are pivoted at 17 upon the arms of the wheel 2, and 18 are the adjustable balls or weights.

20 are screw-shackles having right and left hand threads upon them, and they are connected to the levers 16, and upon which shackles the heads 21 are screwed, and 22 is a contractile spring between the said heads 21, and connected at its ends with the respective heads, and 23 are jam-nuts to prevent the parts becoming loose. The spring can be adjusted by these screw-shackles so as to act with more or less power in resisting the centrifugal force of the governor-balls, and not only may the force of the spring be varied, as circumstances may require, but the ends of the shackles may be brought near to or farther from the pivots 17, there being two or more holes in each lever 16.

When the governor is adjusted for use, the spring 22, drawing the governor-levers 16 toward the engine-shaft 1, turns the axis 13 to its extreme movement in one direction, and the parts are to be so placed that at this time the center of the secondary eccentric 7 and the axis 13 are in a radial plane passing through the center of the engine-shaft, or nearly so, with the center of the eccentric 7 farthest away from the engine-shaft 1, and the main eccentric 6 is in a position to give to the valve of the engine the largest extent of movement. As the engine revolves and the governor-levers 16 are thrown outwardly by centrifugal force, the secondary eccentric 7 is turned, and this acts upon the box 8, frame 9, and slide 4, and causes said slide to move endwise within the ways 5, and in so doing the throw of the main eccentric is lessened, and consequently the steam admitted by the valve is in proportion to the speed of the engine. If it is desired to reverse the lead of the main eccentric and thereby change the direction of revolution of the engine, it can be accomplished by disconnecting the cross bar 14 from the links 15 and giving to said axis 13 a half-revolution, so as to bring the center of the secondary eccentric nearer to the engine-shaft 1 than the axis 13. In doing this the main eccentric 6, the slide, and frame are moved laterally, and the center of the main eccentric is carried to the opposite

side of the center of the engine-shaft. The cross-head 14 is again connected to the rods 15, the ends having been reversed, and the engine will revolve in the opposite direction and the parts will act in the manner before described. It is to be understood that the opening in the main eccentric 6 through which the engine-shaft 1 passes is to be sufficiently large to allow of the described motions being given to the respective parts.

In Letters Patent No. 303,711, granted to me August 19, 1884, there are two levers pivoted to a wheel or arms and a contractile spring between such levers, and a pivoted eccentric; and in Letters Patent No. 317,098, granted to me May 5, 1885, there is a sliding eccentric and an adjustable elliptical spring for regulating the action of the governor, and adapting such governor to different speeds of engine; hence such features are not herein claimed.

I claim as my invention—

1. The combination, with the main eccentric, of a slide and frame formed with or connected to the eccentric, ways fastened to the hub of the main wheel or pulley and receiving the slide of the eccentric, a box within the frame at the end of the slide, a secondary eccentric received into the opening in the said box, and an axis to the secondary eccentric, a cross-bar, links, and governor-levers, substantially as set forth.

2. The combination, with the governor-levers and the pulley or main wheel to which they are connected, of a contractile spring and screw-shackle connections to the governor-levers, a secondary eccentric, its axis, cross-bar, and links to the governor-levers, the main eccentric, and a slide connected to the same, and ways for supporting the slide of the main eccentric between the secondary eccentric and the slide of the main eccentric, whereby the main eccentric is adjusted according to the speed of the main shaft, substantially as set forth.

Signed by me this 20th day of February, A. D. 1886.

DAVID P. DAVIS.

Witnesses:

GEO. T. PINCKNEY,

WILLIAM G. MOTT.