

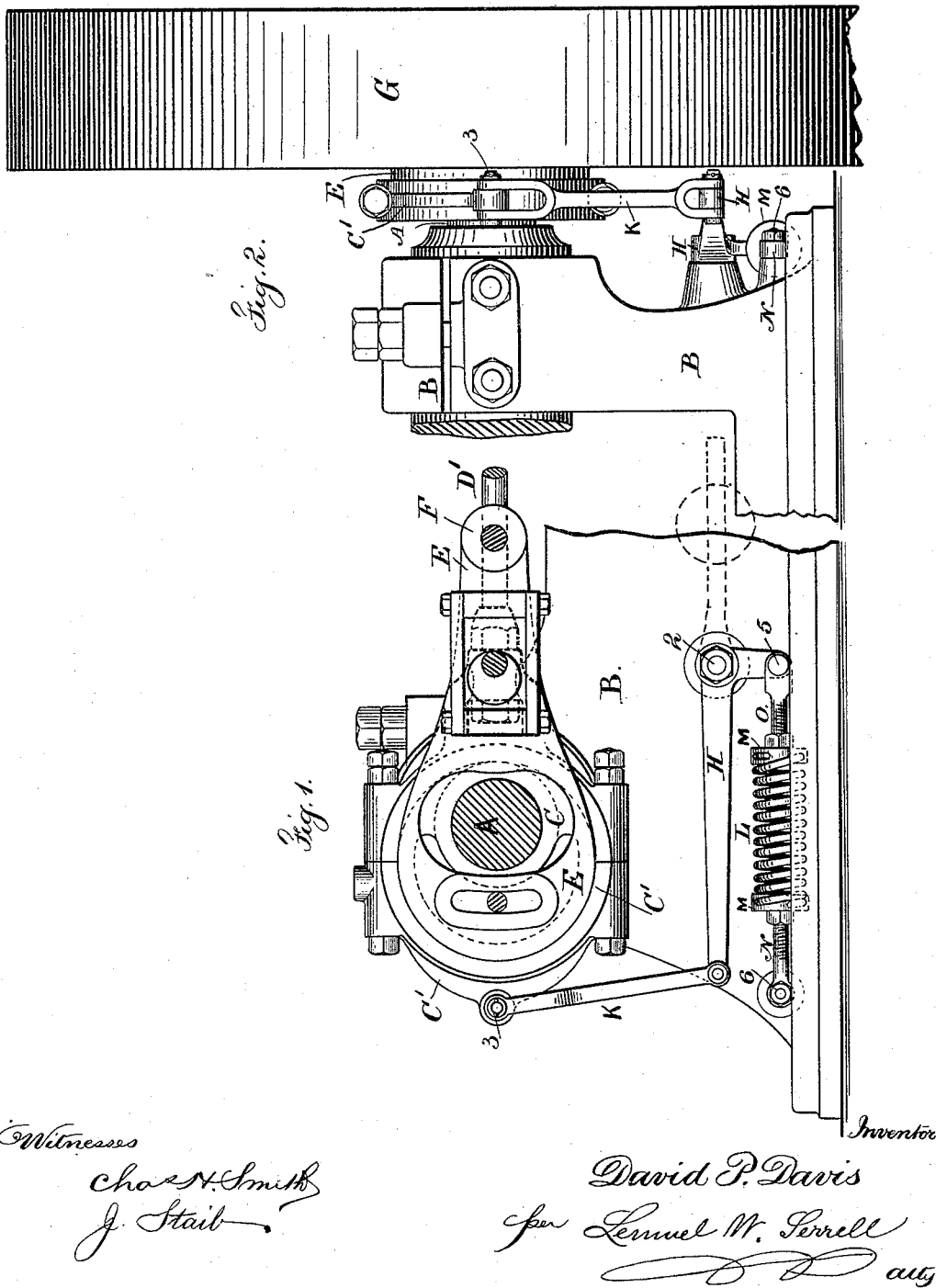
(No Model.)

D. P. DAVIS.

BALANCE FOR STEAM ENGINE ECCENTRICS.

No. 419,836.

Patented Jan. 21, 1890.



Witnesses

Chas. N. Smith
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UNITED STATES PATENT OFFICE.

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

BALANCE FOR STEAM-ENGINE ECCENTRICS.

SPECIFICATION forming part of Letters Patent No. 419,836, dated January 21, 1890.

Application filed May 10, 1889. Serial No. 310,271. (No model.)

To all whom it may concern:

Be it known that I, DAVID P. DAVIS, of Allendale, in the county of Bergen and State of New Jersey, have invented an Improved Means for Balancing the Weight of the Eccentrics, Eccentric-Straps, and Connections for Steam-Engines, of which the following is a specification.

In wheel-governors for automatic engines the centrifugal force of the governor weights or balls has been made use of for shifting the position of the center of the eccentric, and thus varying its angularity in reference to the center of the shaft and the crank-pin, so as to admit more or less steam to the cylinder as the load upon the engine is varied. A device of this character is represented in Letters Patent No. 303,711, granted to me August 19, 1884. In the practical use of governors of this character I have ascertained that after a time more or less wear of the various parts takes place and lost motion is produced, which is multiplied at the eccentric, because of the manner in which it is hung. If the speed of the engine is sufficient, the centrifugal action keeps the eccentric in position and nothing detrimental occurs; but if the speed is slow the weight of the eccentric and its connections causes them to drop slightly every time they pass the center and a jerky action of the valve takes place, causing an unequal distribution of the steam, and the effect is unpleasant, if not detrimental. By balancing the weight of the eccentric and its connections this is entirely overcome, and the result is smooth running at any speed.

In my improvement a counterpoise or balance on the frame of the engine is connected to the eccentric-strap to lessen the wear upon the eccentric and strap, and when used with automatic governors upon the fly-wheel the counterpoise prevents the looseness and lateral movement of the eccentric and the false or jerky movement of the valve.

In the drawings, Figure 1 is a side elevation illustrating my improvement as applied to the eccentric of an engine, and Fig. 2 is an end elevation of the same.

The main shaft A of the engine is supported in the bed-frame and bearings B in any convenient manner, and the eccentric C is of the

proper size and construction, surrounding the shaft A, but not directly connected to the same; and D' represents the eccentric-rod. The eccentric C is provided with an arm E, at the end of which is a pivotal connection F to the fly-wheel or belt-wheel G, and I remark that the governor device is so connected to the eccentric as to move the same laterally and vary the stroke of the valve; but this governor mechanism is not represented, as the same may be such as shown in my aforesaid patent, or it may be of any desired character.

My present improvement relates to the device made use of for balancing the weight of the eccentric, the strap, and a portion of the weight of the eccentric-rod. To effect this I make use of a lever H, pivoted at 2 upon the frame or bed B, and from the long arm of this bent lever H a link K extends to the eccentric-strap C', and it is preferable to fork the end of the link, so that it receives into the fork the strengthening-rib and hub upon the eccentric-strap C', and the connecting-bolt 3 passes through the forks of the link K and through the hub upon the eccentric-strap C'. The spring L is preferably a coiled steel wire or rod connected at its ends to the heads M, and these heads are perforated in the middle and screw-threaded for the reception of the right and left hand screw-rods N O, the rod O being pivoted at 5 to the short arm of the lever H, and the rod N being pivoted at 6 upon the frame or bed B, and there are lock-nuts around the respective screw-rods N and O, adjacent to the heads M. It will now be understood that the spring L acts by tension upon the bent lever H to cause the long end of said lever and the link K to support the eccentric strap and rod to any desired extent, and by loosening the lock-nuts and revolving the spring L and heads M the power of the spring L can be varied to whatever extent desired, and as the eccentric moves the eccentric-rod and the strap C' backward and forward in giving motion to the valve the spring L yields more or less and the lever H turns upon its pivot 2, and the link K swings back and forth by the movement of the eccentric, and in consequence of the weight of the eccentric being supported through the action of the spring and connections to the strap of the eccentric

such eccentric will not fall by its weight or give any false movement to the valve, and the governor is free to give the proper movement to the eccentric laterally in regulating the throw of the valve.

5 In engines that run at a slow speed the lever H may be extended and receive a movable weight, as shown by dotted lines in Fig. 1, so as to dispense with the spring, the weight
10 being its equivalent.

I claim as my invention—

1. The combination, with the laterally-moving eccentric-strap and eccentric-rod, of the yielding support connected to the frame of
15 the engine and the eccentric-strap, respectively, for sustaining the weight of the eccentric or a portion thereof, substantially as set forth.

2. The combination, with the laterally-moving eccentric-strap and eccentric-rod, of the
20 lever H, spring L, and link K, such link K being pivoted to the strap of the eccentric and acting to sustain or partially sustain the weight of the eccentric without interfering with its movement, substantially as set forth. 25

3. The combination, with the eccentric, eccentric-rod, and strap, of the counterpoise lever H, and the link K, connecting the lever to the eccentric-strap, substantially as set forth.

Signed by me this 7th day of May, 1889.

DAVID P. DAVIS.

Witnesses:

GEO. T. PINCKNEY,

WILLIAM G. MOTT.