(No Model.)

C. R. WILLIAMS.

SHIFTING ECCENTRIC.

No. 305,257. Patented Sept. 16, 1884.

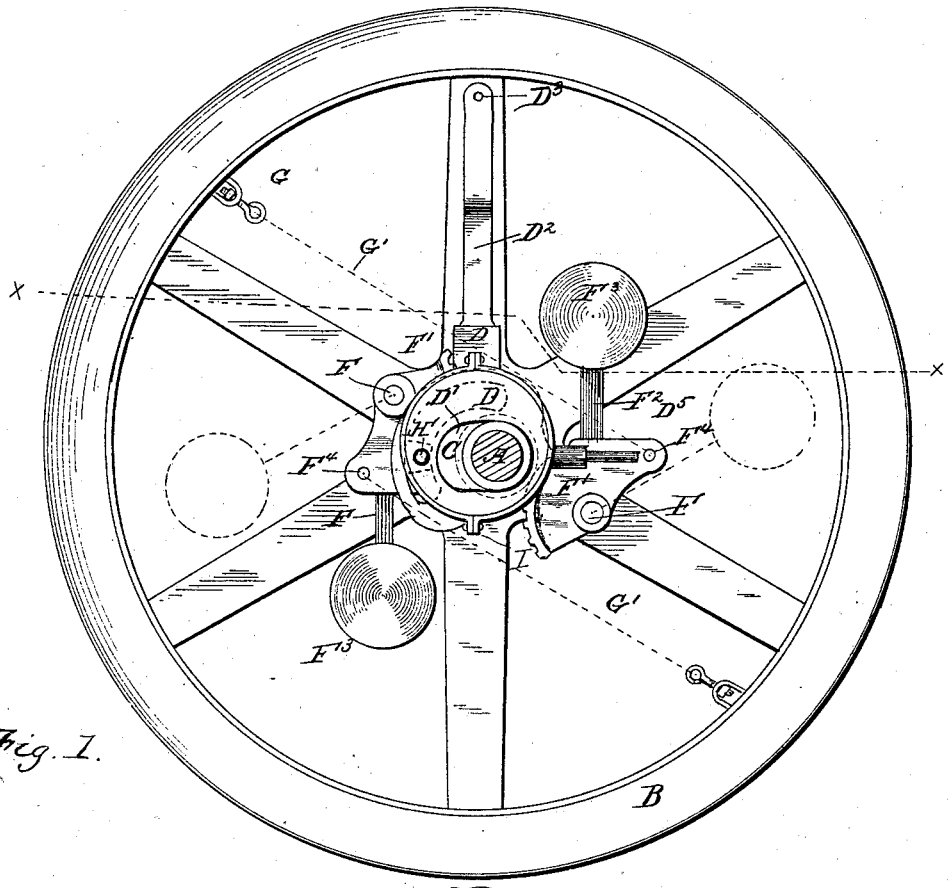

Fig. 1.

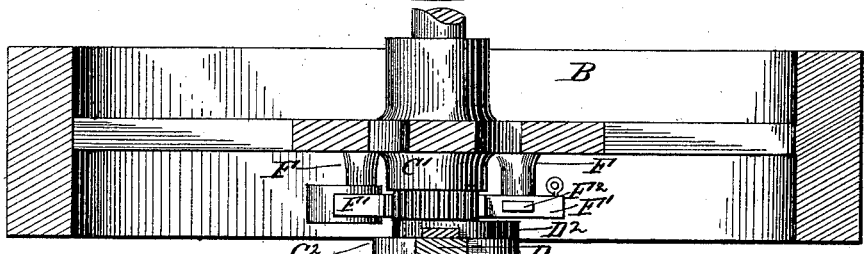

Fig. 2.

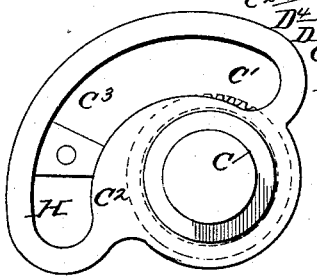

Fig. 3.

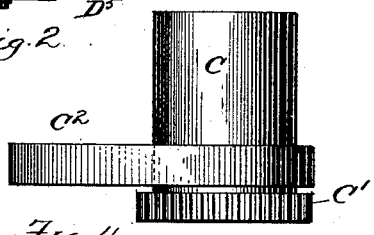

Fig. 4.

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UNITED STATES PATENT OFFICE.

CHARLES RUSSELL WILLIAMS, OF ELMIRA, NEW YORK, ASSIGNOR TO B. W. PAYNE & SONS, OF SAME PLACE.

SHIFTING ECCENTRIC.

SPECIFICATION forming part of Letters Patent No. 305,257, dated September 16, 1884.

Application filed July 24, 1884. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. WILLIAMS, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Shifting Eccentrics, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to shifting eccentrics, and has reference to that particular class which comprises pendulous weights carried by a wheel, disk, or frame-work mounted upon a shaft with which the eccentric is employed, and connected to the eccentric by such means that centrifugal force causes the weights to produce a movement of the eccentric across the shaft in accordance with the rapidity of rotation of the wheel or disk and shaft; and the invention in this instance will be hereinafter described, and the novel features thereof specifically set forth in the claims.

Referring to the drawings, Figure 1 is a side elevation of the invention, the shaft being shown in section. Fig. 2 is a section on the line X of Fig. 1. Fig. 3 is an end elevation, and Fig. 4 a plan of one of the elements employed.

Like letters indicate like parts in all the figures.

A represents a power-driven shaft, preferably a crank-shaft of an engine, and upon it is rigidly mounted a fly-wheel, B, or it may be a disk of any suitable frame-work adapted to support the elements employed in this invention. Loosely mounted upon the shaft is a sleeve, C, which is provided at its inner end with a pinion, C′, and with a projecting plate or disk, C^2, in which is formed a curved slot, C^3.

D is an eccentric, which is slotted, as at D′, to embrace the shaft and the sleeve C, and is suspended by an arm, D^2, connected therewith in any suitable manner, and pivotally attached to the wheel, disk, or frame-work, as at D^3.

D^4 represents the usual eccentric-straps, and D^5 the usual rod connecting the eccentric with the valve of the engine.

E represents a collar suitably fixed upon the shaft A, to serve the purpose of preventing longitudinal movement of the sleeve C upon the shaft, said sleeve being capable of rotary movement thereupon.

At substantially opposite sides of the shaft A are pivotally mounted on the wheel, disk, or frame, as at F, geared sectors F′, each of which is provided with a rigid arm, F^2, carrying a weight, F^3, whereby said weights are virtually pivotally suspended also at the points F. Each of the sectors is projected laterally from the arms F^2, as at F^4, to each of which lateral projections one end of a spring is secured, the opposite end being connected to the wheel, disk, or frame-work in any suitable manner, as at G, the location and arrangement of the springs being shown by the dotted lines G′, the representation of the springs themselves being omitted to avoid confusion in the drawings. The springs employed are preferably the usual coil-spring. The weight-arms and weights are projected from the sectors in opposite directions. Within the curved slot C^3 of the projected plate C^2 is arranged a sliding bearing-block, H, having a bearing for a pin, H′, extending inwardly from the eccentric D into said block. Now it will be observed that by rotating either or both of the sectors F′ the sleeve C will be rotated upon the shaft, and by means of the curved slot C^3 of the plate C^2 the bearing-block will be moved toward and from the shaft in accordance with the direction of the movement of the sector or sectors, and that the suspended eccentric D, having the described connection with the bearing-block, will also be moved across the shaft. The movement of the sectors is accomplished by reason of the outward movement of the weights F^3 in the direction indicated by dotted lines against the tension of the springs during the revolution of the wheel, disk, or frame-work B. The tension of the springs may be primarily regulated to maintain the weights at or near their most inward position, so long as the rapidity of rotation of the wheel or disk B and shaft A is normal, so that when there is an increase of load put upon the engine the velocity of rotation is reduced, the weights are drawn inwardly, and the eccentric is thrown

across the shaft in such a direction as to increase the supply of steam, so that a uniformity of motion in the engine is maintained. On the other hand, with a decrease of load, the speed of rotation is above the normal, the weights are thrown out, and thus operate the sectors in such a manner as to rotate the slotted plate to effect an opposite movement in the bearing-block, the suspended eccentric, and valve-rod, so as to reduce the supply of steam in the engine and again maintain uniformity in its motion.

The bearing-block H may be dispensed with and the pin H′ bear directly within the slot C^3.

Having described my invention and its operation, what I claim is—

1. In a shifting eccentric, a sleeve rotatably mounted upon a shaft, and provided with a curved slotted plate and a pinion, the sleeve, pinion, and plate being constructed to operate in unison, in combination with geared sectors, and with an eccentric having a pin projecting into said curved slot, substantially as specified.

2. The combination, with a wheel, frame, or disk rigidly mounted upon a shaft, an eccentric suspended from the wheel, frame, or disk, and embracing the shaft, pendulous weights, and counterbalancing-springs, of a disk having a curved slot, and connected with a pinion mounted upon said shaft, and means for connecting said disk with suitable pendulous weights and with an eccentric, substantially as specified.

3. In a shifting eccentric of the class described, the combination of the shaft-embracing eccentric provided with a projecting pin, a curved slotted plate provided with a pinion, geared sectors meshing with said pinion, and means for operating the sectors, substantially as specified.

4. The combination of the shaft A, the eccentric D, provided with the pin H′, the slotted plate C^2, having the pinion C′, the sectors F′, weights F^3, and suitable counterbalancing-springs, substantially as shown and described.

5. The combination of the shaft A, collar E, eccentric D, having pin H′ and arm D^2, plate C^2, pinion C′, bearing-block H, and sectors F′, provided with weights F^3, substantially as shown and described.

6. The gear-sector F′, provided with arm F^2, weight F^3, and lateral extension F^4, and with bearings for a pivot, as F, substantially as shown and described.

7. The sleeve C, provided with the pinion C′, and with the plate C^2, having the curved slot C^3, substantially as shown and described.

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

CHARLES RUSSELL WILLIAMS.

Witnesses:

JAMES N. WARD,

EDWARD C. VAN DUZER.