

(No Model.)

T. J. BUTLER.
GOVERNOR FOR MOTORS.

No. 568,517.

Patented Sept. 29, 1896.

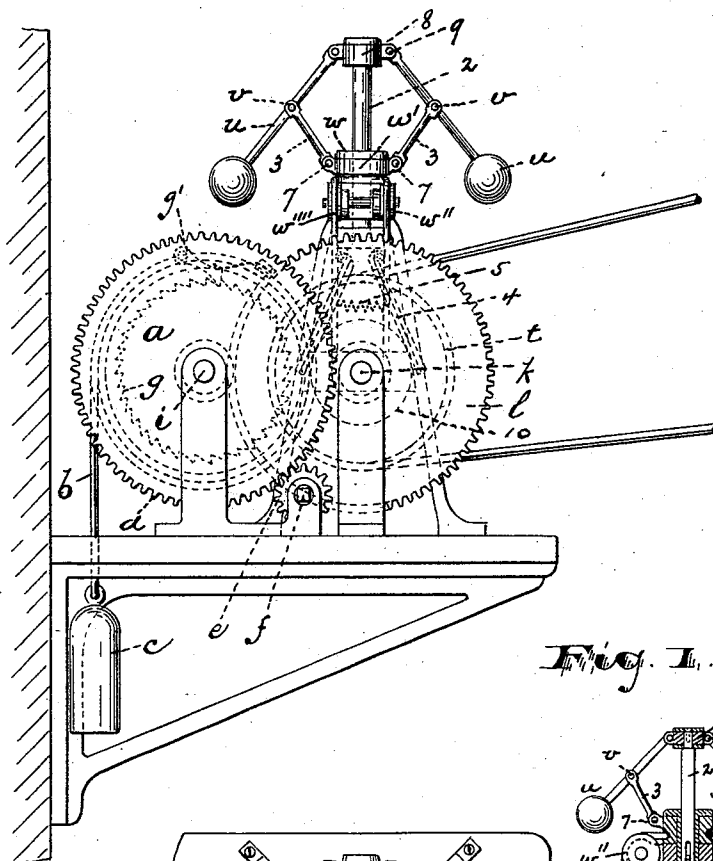


Fig. 1.

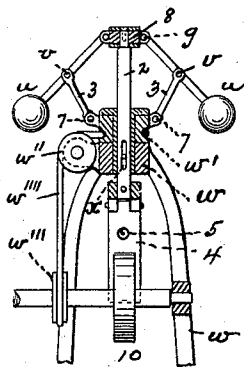


Fig. 3.

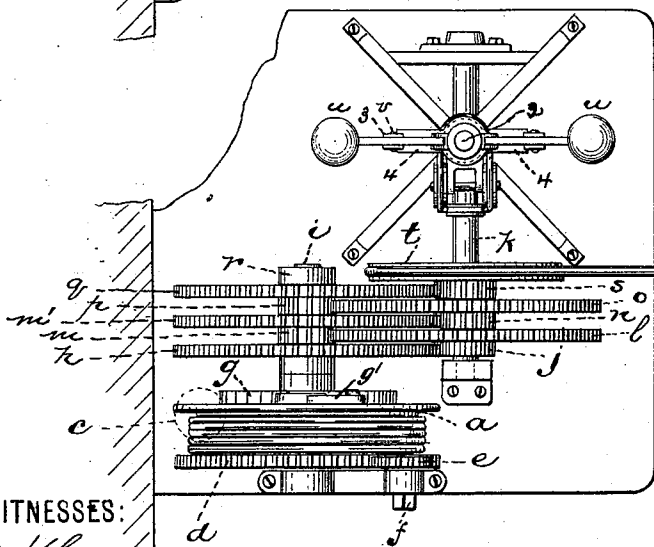


Fig. 2.

WITNESSES:

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UNITED STATES PATENT OFFICE.

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GOVERNOR FOR MOTORS.

SPECIFICATION forming part of Letters Patent No. 568,517, dated September 29, 1896.

Application filed December 20, 1895. Serial No. 572,760. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. BUTLER, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Governors for Motors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and numerals of reference marked thereon, which form a part of this specification.

The object of this invention is to secure a regular and even transmission of motive force by a simple and effective arrangement of parts, and to secure other advantages and results, some of which will be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved governors for motors and in the arrangements and combinations of parts, all substantially as will be hereinafter set forth and finally embraced in the clauses of the claim.

Referring to the accompanying drawings, in which like letters and numerals of reference indicate corresponding parts in each of the several views, Figure 1 is a side elevation of the improved motor. Fig. 2 is a plan of the same; and Fig. 3 is a detail section through the axis of the governor, showing the construction of the governor more fully.

In said drawings, *a* indicates a loose drum, upon which a cord *b*, connected to a weight *c*, may be wound, the said drum having a gear-wheel *d* at one side thereof adapted to mesh with a winding-pinion *e* and arbor *f*, by which the drum may be turned and the cord wound to raise the weight *c*. The descending weight is intended as the source from which the motive force is obtained. At the opposite side of said drum from the winding gear-wheels *d e* are arranged a ratchet-wheel and pawl *g g'*, the ratchet-wheel being fastened upon a shaft *i* in connection with the gear-wheel *h*, the first of a series of gear-wheels by which power is transmitted and speed obtained. The first of said series of wheels is fixed upon the shaft *i* and engages

a loose pinion *j* upon an adjacent parallel shaft *k*. Next in the series is a larger gear-wheel *l*, fixed to move with the pinion *j* and also loose in its relation to the shaft *k*. This engages a pinion *m*, loosely arranged on the shaft *i*. Fixed to the pinion *m* is another large gear-wheel, *m'*, which transmits the power to a third small pinion *n* and the large gear-wheel *o*, attached thereto, and the last said gear-wheel transmits the power to the pinion *p* and large gear-wheel *q*.

The wheels *h, m, m', p,* and *q* are held from moving from their proper side-by-side positions on the shaft *i* by a collar *r*, fastened upon said shaft *i*. The last of the series of gear-wheels on the shaft *i* transmits power to a pinion *s*, fixed upon the shaft *k* in connection with the belt-wheel *t*, so as to rotate the same and enable motion to be transmitted therefrom.

It will be observed that the slow speed first given to the wheel *h* by the weight and drum is largely increased by the train of gearing, so that the wheel *t* will have a high rate of speed suited to the operations of fans, &c.

The speed of the shaft *k* is regulated and controlled by a governor consisting of weighted arms *u u*, fulcrumed, as at *v*, upon connecting-rods 3 3, the latter being pivoted, as at 7 7, upon a pulley *w'* on a fixture *w*, providing bearings for the sliding shaft 2. Within said fixtures *w* is arranged said sliding shaft 2, the same leaving a vertical movement therein under the power induced by centrifugal force. To the upper end of said shaft is a collar 8, in which said shaft rotates, and to said collar is pivoted the weighted rotary arms *u u*, as at 9 9. The said fixture *w* also provides bearings for the belt-wheel *w''*.

On the shaft *k* is arranged a pulley *w'''*, and over the wheel and pulleys *w', w'',* and *w'''* is arranged a belt *w''''*, so that high rotary speed is given to pulley *w'* and the centrifugal arms attached thereto. Under this rotary motion the said arms *u* tend to assume vertical positions and to throw the shaft downward in its bearings, as will be evident. Said shaft is slotted, as at *x*, Fig. 3, a pin extending from the fixture into said slot to prevent the shaft from rotating under friction, as will be apparent.

At the lower end of the shaft 2 is pivoted a pair of brake-shoes 4 4, which normally incline oppositely, forming a Λ -shaped aperture and engaging a friction-wheel 10 on the shaft k . Said brake-shoes press inwardly upon said friction-wheel, the pressure being increased by a spring 5, extending from one shoe to the other. By this construction the pressure is increased as the shaft 2 is forced downward with its shoes, as will be apparent.

The operation of the parts has, perhaps, been sufficiently made clear by the foregoing, but lest there should not be a full understanding of the methods of manipulation and movements of the machine I may state that I first wind up the cord b upon the drum or barrel a , thus raising the weight c to a position from which it may slowly descend, and in this operation I employ an ordinary hand-crank, which is arranged on the angular end of the winding-arbor f and turned. This action turns the pinion e and cog-wheel d , and with the latter the said drum a . Return or back movement is prevented by the ratchet and pawl $g g'$, the first being fixed upon the shaft i and the latter upon the drum. The power of the weight is thus transmitted through the drum and shaft i to the first cog-wheel, p , of the series. The train of large and small cog-wheels $j l m m' o p q s$ transmits the movement, with increased speed, to the power-pulley t and shaft k , and through the latter to the pulley w''' , belt w'''' , to the governor-pulley W' , and thence to the weighted arms u . Increased and diminished speed serves to raise or lower the shaft and increase or diminish the pressure of the brake-shoes

upon the friction-wheel 10 with responsive effects well understood.

Having thus described the invention, what I claim as new is—

1. In a motor, the governor comprising a fixture, a vertically-movable shaft and a rotary pulley having bearings on said fixture, centrifugal arms u, u , and connecting-rods 3, 3, pivoted on one another and upon a collar at the top of said shaft and said pulley, and adapted to press the shaft downward under increased centrifugal action, brake-shoes pivoted to said shaft, a spring connecting the said shoes and a friction-wheel engaged by said brake-shoes and controlling the operation of the motor, said parts being arranged and combined, substantially as and for the purposes set forth.

2. In a motor, the governor comprising the fixture w , vertical shaft sliding therein, and having at its lower end oppositely-inclined brake-shoes, and a spring 5, and at its upper end a loose collar, a pulley arranged on said fixture, connecting-rods, 3, 3, pivoted on said pulley, centrifugal arms pivoted on said collar and fulcrumed on said connecting-rods, and means for rotating said pulley, all said parts being arranged and combined substantially as and for the purposes set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 7th day of December, 1895.

THOMAS J. BUTLER.

Witnesses:

CHARLES H. PELL,
C. B. PITNEY.