

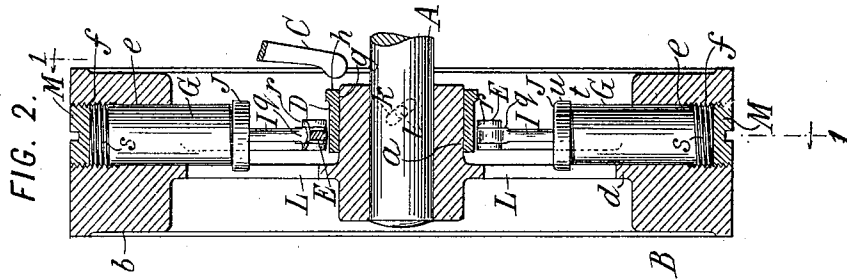
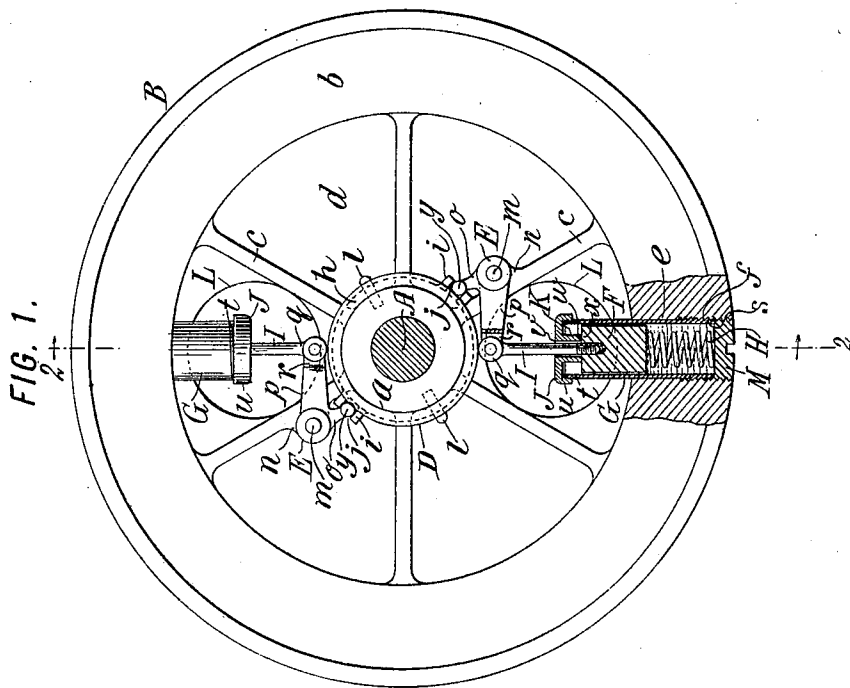
No. 666,237.

Patented Jan. 15, 1901,

C. C. & E. A. RIOTTE.
GOVERNOR.

(Application filed Aug. 30, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

CARL C. RIOTTE AND EUGENE A. RIOTTE, OF NEW YORK, N. Y., ASSIGNORS,
BY MESNE ASSIGNMENTS, TO THE U. S. LONG DISTANCE AUTOMOBILE
COMPANY, OF ELIZABETH, NEW JERSEY.

GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 666,237, dated January 15, 1901.

Application filed August 30, 1899. Serial No. 728,945. (No model.)

To all whom it may concern:

Be it known that we, CARL C. RIOTTE and EUGENE A. RIOTTE, citizens of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Governors, of which the following is a specification.

This invention relates to governors for motors, and particularly to shaft or fly-wheel governors, and aims to provide certain improvements therein.

Various constructions of fly-wheel governors have heretofore been employed, combining an eccentric or member adjustable either around or along the axis of the shaft for controlling the throttle-valve or otherwise manipulating the speed-regulating mechanism of an engine or motor, and comprising also balls or weights operated by centrifugal force and operating such member, connecting-levers between the balls and such member, and springs for controlling movement of the balls.

Our present invention relates especially to governors of this class, and provides certain features of improvement in the construction thereof, which will be hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a front elevation, partly in vertical section, showing the preferred form of our improved governor. Fig. 2 is a vertical axial section thereof, and Fig. 3 is a perspective view of a weight-lever.

Referring to the drawings, let A indicate the shaft, B the fly-wheel, and C the speed-controlling lever, of a motor, and let D represent the movable cam ring or collar, E the levers, F the balls or weights, G the cylinders, and H the springs, of our improved governor.

The shaft may be any suitable shaft, the speed of which is to be governed. The wheel B may be any suitable wheel, as the fly-wheel of a motor, and the speed-controlling lever C may be any device capable of being operated by the cam D, the parts shown being convenient examples for illustration of our present improvements.

We will now describe in detail a preferred form of our invention, as shown in the drawings.

The fly-wheel B is provided with a smooth cylindrical hub *a* on one side, with a heavy rim *b* and with connecting-spokes *c* and intermediate web *d* at one side of the axial center of the wheel, so that the length of the hub and rim at the side of the wheel toward the lever C is sufficient to provide room at this side for the cam-ring, balls, and levers and for the axial play of the ring. The wheel is formed with radial bores, cores, or recesses *e* at diametrically opposite points on the inner side of the rim, which have internally-screw-threaded portions *f* near the outer periphery of the rim and are designed to receive the cylinders G.

The cam-ring D has a smooth central bore *g*, fitting movably on the inner end *a* of the hub, so that it can oscillate around the axis of the wheel as well as move axially along the hub. It also has an outer bearing-face *h* at right angles to this bore for engaging with the end of the regulating-lever C at a predetermined speed and shifting the latter when such limit of speed is passed. On its exterior the cam-ring has provisions, as the parallel lugs *i* and intermediate notch *j*, for engaging with the levers E at diametrically opposite sides. Intermediate of these provisions the ring D has a cam slot or face *k* for engaging a cam projection or face *l*, carried by the hub *a* of the wheel, these parts being of such construction that as the cam is turned on the hub these engaging faces will cause it to move axially along the hub for shifting the lever C. The cam-faces *k* and *l* are preferably duplicated at diametrically opposite points.

The weight-levers E are shown as elbow-levers, each fulcrumed at *m* to a boss *n* on the wheel, and each having a short arm *o*, engaging the cam-ring D, and a long arm *p*, connected to the adjacent ball F. The longitudinal axes of the respective arms are acutely oblique at their intersection, as seen in Fig. 1, so that when the lever is in passive position the point of engagement of the short arm with the cam-ring is but slightly at one side of a direct line between the axis of the wheel and the fulcrum of the lever, and as the long arm moves outwardly toward the active position this point of engagement will be drawn inwardly until it is approximately

in alinement with said point, thus insuring a substantially direct action between the short arm and the ring and the minimum of inward movement of the arm relatively to the ring in proportion to the rotative movement of the latter.

The weight F is preferably a solid metal cylinder moving radially of the wheel and connected to the long arm of its lever by a rod I, which can be screwed into the weight, as shown, so as to permit adjustment, if desired, and which has an eye *g* at its inner end entering a fork *r* in the end of the long arm and connected to the latter by a pin. The weight is housed in the cylinder G, and preferably forms therewith a dash-pot. The cylinder G consists of an internally-cylindrical casing loosely receiving and movably holding the weight, which casing is fixed in the recess *e* in the rim, preferably adjustably, as by being provided with a screw-thread *s* on its inner end engaging the screw-thread *f* of the recess. The cylinder is preferably filled with oil or other suitable material for retarding movement of the weight to form a dash-pot, the fit between the weight and cylinder being adapted to limit movement of the weight to a predetermined speed of the flow of the retarding medium from the outer to the inner side of the weight. The dash-pot thus provided is double-acting in this respect, and for this purpose the cylinder is provided with a cap J closing its inner end, which cap has an internal screw-threaded flange *u*, screwing on the inner screw-threaded end *t* of the casing, and thereby adjustably connected to the latter in a leak-tight manner. The cap has a central guideway *v* loosely receiving and guiding the rod I, and it also has an inwardly-projecting boss K surrounding this rod extending inwardly a suitable distance and there having a seating-face *w*, adapted to engage a face *x* at the inner end of the weight, and to thereby support and limit the inward movement of the latter as well as to make a leak-tight joint at this point for preventing exit of the oil from the dash-pot when the governor is at rest, in which case the weight of the uppermost dash-pot will lie on the inner end of the boss K and prevent escape of any oil around rod I. While revolving there will be no danger of such escape of oil, centrifugal force holding the oil away from the inner end of the dash-pot; but when stationary such leakage must be prevented, and our invention provides in this simple way for this, as well as permitting the relative adjustability of the inward limit of movement of each weight.

The spring H for each weight is seated in the corresponding recess *e* of the wheel and preferably within the cylinder G and reacts against the outer side of the weight and the inner face of the rim at the bottom of the recess, which constitutes the end wall of the cylinder in the construction shown.

The connection between the ring D and the

short arms of the levers may be any suitable connection; but we prefer that provided by our invention, by which the lugs *i* on the ring constitute long smooth faces, between which an elongated and partially-cylindrical head *y* on the end of the short arm works.

We prefer to form the web *d* of the wheel with circular apertures L opposite each dash-pot, so that the cap can be conveniently manipulated for adjustment or removal.

While it will be understood that duplication of the weights is not essential to the operation of the governor, it will be understood that such duplication effects a counterbalancing of the parts, and that should the multiplication of parts be increased it will be most advantageous to so dispose them relatively to the wheel that no matter how many weights are used the wheel and governor will be properly counterbalanced.

In operation the governor will be adjusted, as described, the weights shifting the ring toward the lever C as the speed increases to operate the latter at a predetermined limit of speed. The cylinders will prevent undue jumping of the weights in either direction and will guide them as well as inclosing them against access of dirt and keeping them constantly working in oil and constitute with the weight a novel form of dash-pot.

It will be seen that our invention provides improvements in governors which are simple in construction, easy of adjustment and application, and which can be readily and advantageously employed, and it will be understood that we do not limit ourselves to the particular details of construction, arrangement, and combination of parts set forth as constituting the preferred form of our invention, since the invention can be employed as circumstances or the judgment of those skilled in the art may dictate without departing from the spirit of the invention.

It will be seen that the interior of the cylinder constitutes a guiding-socket for the weight and an inclosing-socket for the spring, so that the weight is assuredly kept in proper position and has a true radial movement, and the reaction of the spring is obtained without the necessity of connecting it directly to any part, it being possible to use an ordinary spiral spring in the governor. As shown, the recess in the rim for containing the cylinder, weight, and spring is cored entirely through, and its internal thread *f* extends clear to the end, the end being closed by a screw-plug M, which also serves as a set-screw for the casing of the dash-pot. If desired, the dash-pot may be screwed in or out for adjustment, and the set-screw, if used, may follow it. It will be understood that the collar D may be any suitable shifting collar and may be moved in any suitable manner from one or more of the balls F. In using our improved governor for gas-engines and similar motors in which sudden variations of speed have particularly to be contended with it will be found

that the throbbing or hammering of the weight with the varying impulses is so far eliminated as to be practically unnoticeable, if apparent at all, the governor being so controlled as to be incapable of pounding with varying impulses and still so sensitive as to accurately govern the operations of the motor.

What we claim is—

1. In governors, the combination with a wheel, and a shifting collar, of a weight revolving with said wheel and movable under centrifugal force, a cylinder inclosing said weight, a connection between said weight and said collar for transmitting the motion of the weight to the collar, consisting of a lever fulcrumed to said wheel and having two arms, the one connected to said weight and moved thereby, and the other connected to said collar for moving the latter, and a connection between said lever and collar consisting of a projection on the one and a notch on the other receiving and embracing said projection.

2. In governors, the combination with a wheel, and a shifting collar, of a weight revolving with said wheel and movable under centrifugal force, a cylinder inclosing said weight, a connection between said weight and said collar for transmitting the motion of the weight to the collar, consisting of a lever having two arms, the one connected to said weight and moved thereby, and the other connected to said collar for moving the latter, and a connection between said lever and collar consisting of a recess extending parallel with the axis of said wheel on one of said parts, and a projection carried by the other of said parts and fitting within said recess, said recess and projection permitting the axial movement of the collar relatively to the lever while transmitting swinging movement of the lever to oscillate the collar.

3. In governors, the combination with a wheel, and a shifting collar, of a weight revolving with said wheel and movable under centrifugal force, a cylinder inclosing said weight, a connection between said weight and said collar for transmitting the motion of the weight to the collar, consisting of a lever having two arms, the one connected to said weight and moved thereby, and the other connected to said collar for moving the latter, and a connection between said lever and collar consisting of a recess on the collar, and a rounded head *y* formed on the lever, and fitting said recess.

4. In governors, the combination with a weight movable under centrifugal force, a cylinder inclosing said weight, a shifting collar operated by said weight, and a connection between said parts, of a wheel carrying said parts, having a hub on which said collar is axially and rotatively movable, having a rim surrounding said hub and having spokes between said hub and rim disposed at one side of the longitudinal center of the rim, where-

by a greater space exists at the inner than at the outer side of said wheel, and said weight and collar can be located in said space.

5. In a governor, the combination with a shifting collar and a weight for operating it, of a wheel carrying said parts, having a socket in its rim receiving and guiding said weight in its movements, and a connection between said weight and said collar for transmitting motion of the weight to the collar.

6. In a governor, the combination with a shifting collar and a weight, of a wheel carrying said parts, having a rim and having a recess in said rim, a spring mounted in said recess and reacting against the outer side of said weight, and a connection between said weight and said collar for moving the latter as the weight moves.

7. In governors, the combination with a shifting collar and a weight, of a wheel carrying said parts, a casing carried by said wheel and inclosing said weight, an adjustable connection between said casing and said wheel, and a connection between said weight and said collar for moving the collar with the weight.

8. In a governor, the combination of a shifting mechanism, a weight adapted to operate said mechanism, and a casing inclosing said weight and forming therewith a dash-pot.

9. In a governor, the combination of a shifting mechanism, a weight adapted to operate said mechanism, a casing inclosing said weight and forming therewith a dash-pot, and a spring reacting against said weight.

10. In a governor, the combination of a shifting mechanism, a weight, a cylinder inclosing said weight, and forming therewith a dash-pot, said cylinder closed at its inner end and there having a socket and a bearing face surrounding said socket, a rod connected to said weight for transmitting the motion thereof to said shifting mechanism and passing through said socket, and said weight having a bearing face on its inner end for engaging the bearing face on the inner end of said cylinder, for preventing leakage through said socket when the governor is at rest.

11. In a governor, the combination with a weight and means for utilizing its movement, of a wheel carrying the weight and such means, and having a rim, a cylinder inclosing said weight, and consisting of a tubular casing adjustably connected to said rim, and a screw screwing into said rim for locking said dash-pot therein.

12. In governors, the combination with a weight and a shifting mechanism, of a wheel carrying said weight, a cylinder carried by said wheel and inclosing said weight, and a cap adjustably connected to the inner end of said cylinder for closing the latter and limiting inward movement of said weight.

13. In a governor, the combination with a shifting mechanism, and a wheel, of a casing, and a plunger therein, and forming there-

with a dash-pot, said parts both revolving with said wheel, and one of said parts connected to said mechanism and constituting a weight for operating it.

5 14. In a governor, the combination with a shifting mechanism and a weight for operating it, of a wheel carrying said weight, having a socket in its rim closed at its outer side for receiving and guiding said weight in its
10 movements, and a connection between said weight and said mechanism for transmitting motion of the weight to the mechanism.

15 15. In a governor, the combination with a shifting mechanism and a weight for operating it, of a wheel carrying said weight, a cylinder carried by said wheel inclosing said weight and forming therewith a dash-pot, and a spring within said cylinder opposing outward movement of the weight.

20 16. In a governor, the combination with a shifting mechanism, a weight adapted to

operate said mechanism, and a cylinder inclosing said weight.

17. In a governor, the combination with a shifting mechanism, a weight adapted to 25 operate said mechanism, a cylinder inclosing said weight, and a spring reacting against said weight.

18. In a governor, the combination with a shifting mechanism, a weight adapted to 30 operate said mechanism, a cylinder inclosing said weight, and a spring within said cylinder reacting against said weight.

In witness whereof we have hereunto signed our names in the presence of two subscrib- 35 ing witnesses.

CARL C. RIOTTE.
EUGENE A. RIOTTE.

Witnesses:

GEORGE H. FRASER,
THOMAS F. WALLACE.