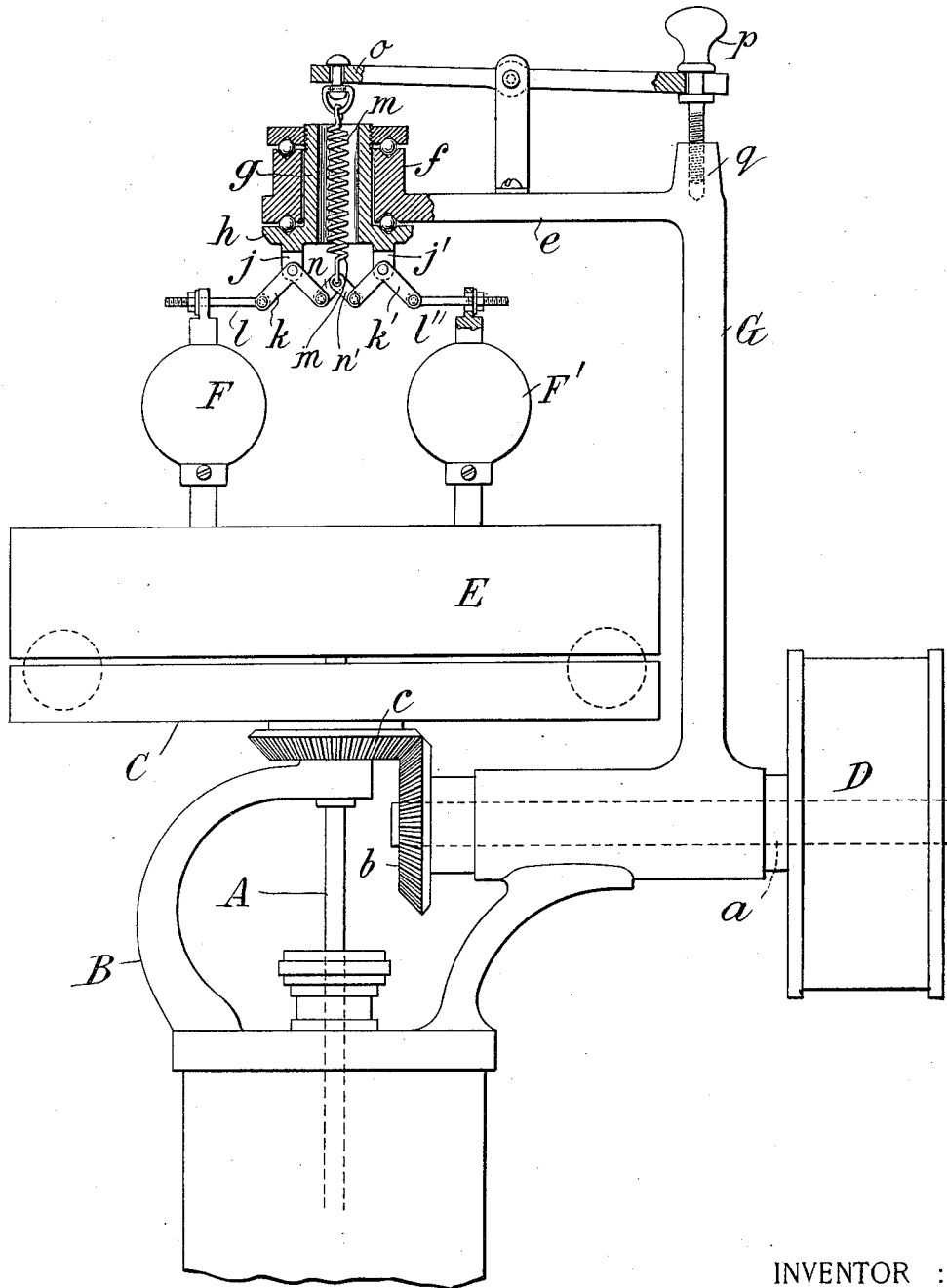


C. GRANT.
TENSION ADJUSTING MECHANISM FOR GOVERNORS.
APPLICATION FILED MAY 28, 1910.

1,013,088.

Patented Dec. 26, 1911.



WITNESSES:

Rene Gruene
William J. Martinez

INVENTOR :

Charles Grant,

By Attorneys,

Thos. Turk Myers

UNITED STATES PATENT OFFICE.

CHARLES GRANT, OF SALISBURY, MARYLAND.

TENSION-ADJUSTING MECHANISM FOR GOVERNORS.

1,013,088.

Specification of Letters Patent.

Patented Dec. 26, 1911.

Application filed May 28, 1910. Serial No. 563,904.

To all whom it may concern:

Be it known that I, CHARLES GRANT, a citizen of the United States, residing in Salisbury, in the county of Wicomico and State of Maryland, have invented certain new and useful Improvements in Tension-Adjusting Mechanism for Governors, of which the following is a specification.

This invention relates to governors and aims to provide certain improvements therein.

The invention is particularly directed to improvements in governors of the type described in my application No. 317,972, filed May 21, 1906, although it is applicable to any type of governor in which it is desired to alter or vary the tension of springs or analogous devices which restrain or accelerate the movements of centrifugal or inertia weights.

According to the invention I provide means for altering the tension or compression of such springs while the governor is in motion, so that it is not necessary to bring the latter to a stop in order to obtain the required adjustments, although the device provided by the invention is capable of being operated while the parts are in condition of rest.

In the accompanying drawing I have illustrated in side elevation, partly in section, the invention as applied to a governor of the type set forth in said application.

Referring to the drawings let A indicate a valve stem or other part which it is desired to control, B a suitable bracket adapted to be bolted to the engine frame, C a governor body and D a suitable pulley geared to the governor body by means of a shaft *a* and beveled gears *b c*. Any other method of mounting the governor may be adopted and for the valve stem A may be substituted any part by means of which the engine is to be controlled. In the construction shown I preferably utilize an inertia weight or wheel E and fly balls F F' as shown in my said application. The movements of the inertia weight and fly balls are communicated to the valve stem A by connecting mechanism which is not shown and for a full description of which reference is made to said application. It is sufficient to state that the fly balls F F' are capable of movements toward and away from each other, and that such movements are preferably combined with angular movements of

the inertia weight E in such manner that the movements of one part involve movements of the other.

In the particular construction shown it is desirable to connect the fly balls F F' by spring tension so that the spring resists movements of the balls away from each other. In the construction shown in said application an ordinary spiral spring was connected with the shafts carrying the fly balls. According to the present construction I provide an adjustable means for altering the tension of this or any analogous spring while the governor is in motion. In the form shown in the drawing I provide a standard G which is fixed to the bracket B, which standard has an arm *e* the end of which is formed as a hub *f* which is approximately concentric with the shaft A. On the hub *f* is mounted to turn a sleeve or barrel *g*, the latter being preferably provided with ball bearings above and below the hub *f* as shown. The lower part of the sleeve *g* is formed with a flange which is provided with depending lugs *j j'* to each of which is pivoted a bell crank lever *k* or *k'*. Each of the bell crank levers is connected to the balls F or F' (or to the shafts of the latter as shown) by a link *l* or *l'*, which links may be flexible if desired. The inner ends of the bell crank levers are connected to the lower end of a spring *m* by links *n n'*. The upper end of the spring is swiveled to a lever *o* pivoted to any suitable part of the standard G, while the opposite end of the lever is provided with a thumb-screw or like device *p* passing through the end of the lever and screwing into a projection *q* formed upon the standard G.

By the means just described when the governor rotates, the barrel *g* rotates with it, and the spring turns with relation to the lever *o* by means of its swivel connection therewith. When the fly balls F F' move outwardly in practice the bell crank levers are tilted, thus straightening the links *n n'* and increasing the tension upon the spring *m*. When it is desired to alter the tension upon the spring the thumb-screw *p* is turned in the direction required. By this means the governor may be made more or less sensitive.

The chief feature of importance is the fact that adjustments may be made while the governor is in action, so that effect upon the governor of altered conditions will be at

once apparent, and the most effective tension under given conditions can be soon ascertained. In this connection and in the claims I use the word "tension" to indicate the stress upon the spring whether it is caused by expansion or compression.

While I have shown and described one form of the invention, it is to be understood that I do not wish to be limited thereto as various modifications may be made therein without departing from the invention.

What I claim is:—

1. The combination with a governor having a centrifugal weight and a spring, of means for altering the tension of said spring connected to said spring in the center of revolution of said weight.

2. The combination with a governor having a centrifugal weight and a spring, of means for altering the tension upon said spring connected to said spring in the center of revolution of said weight.

3. The combination with a governor having an inertia weight and a spring, of means for altering the tension upon said spring connected to said spring in the center of revolution of said weight.

4. The combination of a governor having a weight and a spring connected with said weight, of means for altering the tension on said spring connected to said spring in the center of revolution of said weight, said means being adapted to be operated while the governor is in motion.

5. The combination with a governor having a weight and a spring connected with said weight, of an adjusting device and a swivel connection between said spring and said adjusting device in the center of revolution of said weight.

6. The combination with a governor having a weight and a spring connected with said weight, of a rotary sleeve connected

with said weight, and an adjusting device, said spring being swiveled to said adjusting device in the center of revolution of said weight.

7. The combination with a governor having a pair of weights, of a spring connected with both of said weights, and means for adjusting said spring connected to said spring in the center of revolution of said weights.

8. The combination with a governor having a pair of weights, of a spring connected with both of said weights, and means for adjusting said spring connected to said spring in the center of revolution of said weights, said means being adapted to be operated while said weights are in motion.

9. The combination with a governor having a pair of weights, of a rotary sleeve, levers connected to said sleeve and to said weights, and a spring connected to said levers.

10. The combination with a governor having a pair of weights, of a rotary sleeve, levers connected to said sleeve and to said weights, a spring connected to said levers, an adjustable member, and a swivel connection between said spring and member in the center of revolution of said weights.

11. In a governor, the combination with a governor element and adjusting means for altering its condition of means for actuating said adjusting means while the governor is in motion or in a state of rest connected thereto in the center of revolution of said element.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

CHARLES GRANT.

Witnesses:

E. C. FULTON,
SAML. HAMMER.