

No. 744,198.

PATENTED NOV. 17, 1903.

F. D. HOWE & L. T. GIBBS.

INERTIA GOVERNOR.

APPLICATION FILED MAY 5, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig.1

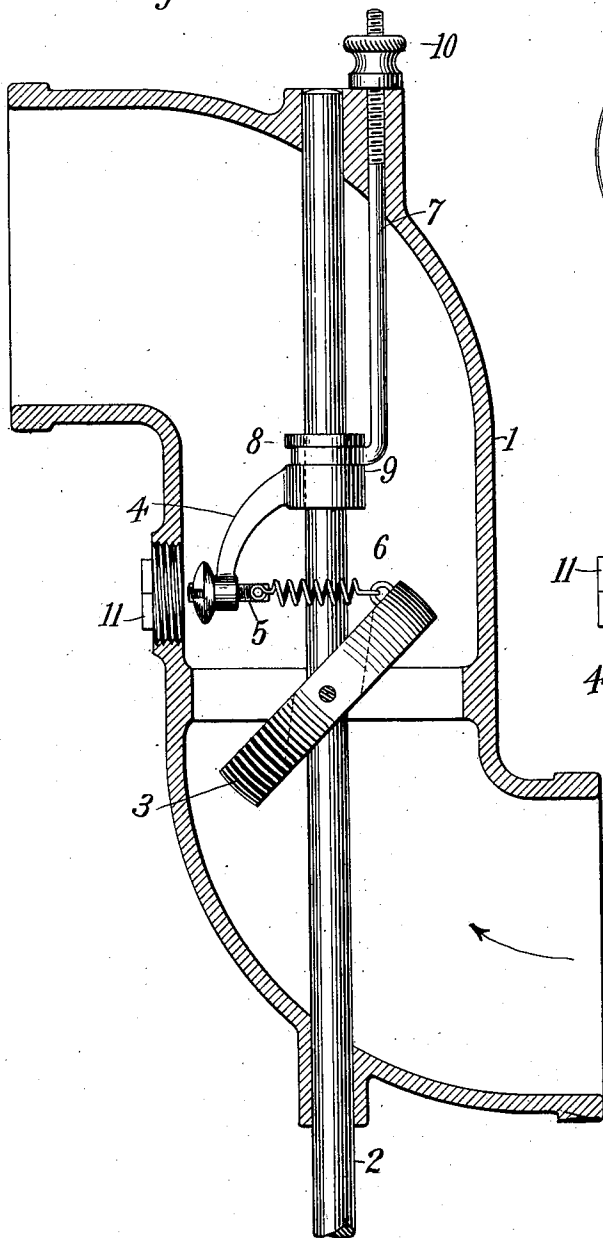


Fig.3

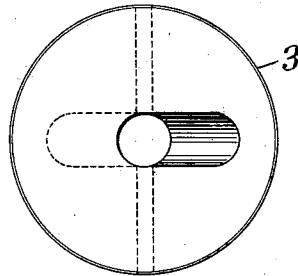
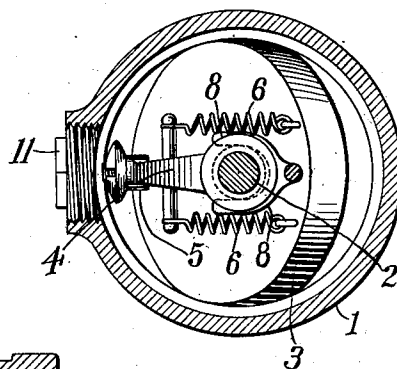


Fig.2



Witnesses:

Raphael Petter

A. S. Dunham

Lucius T. Gibbs
and Frank D. Howe

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by Kern, Page & Cooper, Attys.

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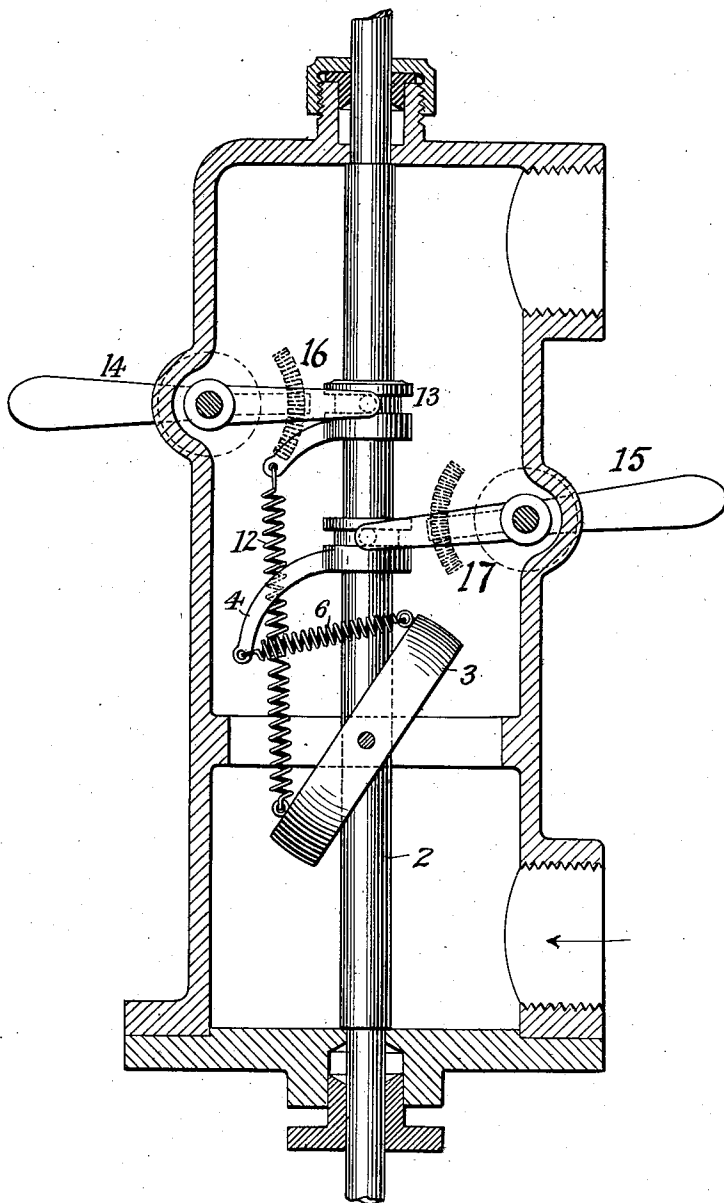
INERTIA GOVERNOR.

APPLICATION FILED MAY 5, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 4



Witnesses:

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UNITED STATES PATENT OFFICE.

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INERTIA-GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 744,198, dated November 17, 1903.

Application filed May 5, 1903. Serial No. 155,729. (No model.)

To all whom it may concern:

Be it known that we, FRANK D. HOWE, residing at Bayside, county of Queens, and LUCIUS T. GIBBS, residing at New York, county of New York, State of New York, citizens of the United States, have invented certain new and useful Improvements in Inertia-Governors, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

Our invention relates to devices for automatically throttling the flow of steam, air, gas, vapor, or any other gaseous fluid whatsoever through a conduit, and while its chief utility will be found in connection with engines or motors it is obviously not limited to such application, but may be employed with manifest advantage wherever a flow of gaseous fluid in a conduit is to be automatically regulated.

The essential feature of our invention consists in combining the inertia device and controlling-valve in one element.

It also embraces means for regulating the governor so that the same may be adjusted to permit with great exactness any predetermined flow between the minimum and maximum.

It also embraces means for enabling the working parts of the governor to be readily reached for purposes of repair, adjustment, cleaning, &c.

Referring now to the drawings, Figure 1 shows, partly in longitudinal section, a convenient embodiment of our invention. Fig. 2 is a section on line 2 2, Fig. 1. Fig. 3 is a plan view of the combined valve and centrifugal device. Fig. 4 is a sectional view of the preferred form of our invention.

The pipe or conduit through which the gaseous fluid flows is indicated at 1. It is preferably, though not necessarily, of modified S shape in order to readily accommodate a shaft 2, for a purpose to be described later. On the shaft, in an intermediate position in the pipe, is a circular disk 3, pivoted to swing freely on a diameter at right angles to the shaft. The opening in the disk 3 through which the shaft passes has its axis inclined from the perpendicular to the plane of the

valve, as shown in Fig. 2 and in dotted lines in Fig. 1, for a purpose explained hereinafter.

Slidably mounted on the shaft, but keyed thereto to rotate therewith, is an arm 4, carrying a screw device 5. The latter carries one or more springs 6 6, secured at their other ends to the inertia-valve, preferably near its edge. Secured to the arm in any suitable way is a device for adjusting the same longitudinally on the shaft—as, for example, the rod 7, having fingers 8 8, which clasp the neck 9 and permit the latter to rotate freely therein. By means of a thumb-nut 10 or any other convenient device the rod may be reciprocated to adjust the tension-arm longitudinally on the valve-shaft.

In the pipe, at any convenient position in or near the plane of rotation of the tension-arm, is an opening closed by a removable closure 11. When the plug is removed, the inner parts are readily accessible to clean the same, make repairs, adjust the tension of the springs, &c.

From the foregoing the operation of the governor will be easily understood. The fluid enters the apparatus preferably from the lower side, as indicated by the arrow. The shaft 2 is rotated by proper connection with the moving parts of the engine, to which latter the fluid is supplied. When for any reason the speed of the engine rises above the predetermined limit, the disk 3 assumes a position more nearly coincident with the plane of its rotation, and thus reduces the aperture through which the fluid passes. The supply to the engine being thus reduced, the speed immediately declines. If the speed should fall below the predetermined limit, the reverse operation takes place, as will be readily seen. At very high speeds the supply can be cut down practically to nothing, since the disk may be made to fit with very slight clearance, and since the inclination of the opening 3 is such that when the valve is approximately at right angles to the shaft the opposite edges of the opening will be quite close to the shaft. To vary the speed of the engine, the springs 6 6 are adjusted by the screw device 5. The degree of sensitiveness of the governor is determined by the position of the arm 4 on the

shaft. The former adjustment is made by sliding the arm up to raise the limit of speed, as will be readily understood, and by lowering the arm to reduce the speed limit. The second adjustment is effected by removing the plug 11 and then altering the tension of the springs by adjusting the screw mechanism 5.

In the form shown in Fig. 4 the speed limit and also the sensitiveness of the device can be varied without stopping the engine and cutting off the flow through the conduit 1. In this device the pull of the springs 6, which tends to keep the valve open, is opposed by the springs 12. The tension of the latter, and consequently the resultant force which holds the valve open, may be regulated by moving the collar 13 longitudinally on the shaft 2 by means of the lever system 14. The sensitiveness of the device may be varied by moving the arm and collar 4 by means of a similar lever system 15. Convenient scales and pointers 16 17, as shown, may be provided, if desired, to indicate to the operator the precise positions of the adjusted parts.

The devices herein specifically illustrated and described are of course typical merely of our invention, which obviously may be embodied in widely-varying forms without departure from its proper scope.

What we claim is—

1. The combination with a conduit, of a valve rotating therein, adapted to close or open the conduit by change in the speed of its rotation.

2. The combination with a conduit, of a valve rotating therein, adapted to close or open the conduit by change in the speed of its rotation, and means for fixing the limit of speed above or below which the valve operates.

3. The combination with a conduit, of a shaft rotating therein, a disk pivoted on said shaft and rotating therewith, and spring devices to control the effect of centrifugal force on the disk, as set forth.

4. In a device of the character described, the combination with the rotatable shaft and the valve pivoted thereon, of an adjustable

spring connected to the valve and rotating in unison with the valve and its shaft, whereby the effect of centrifugal force on the valve may be controlled, as set forth.

5. In a device of the character described, the combination with the rotatable shaft and the valve pivoted thereon, of an arm carried by and rotating with the shaft, and an adjustable spring intermediate the valve and the arm, as set forth.

6. In a device of the character described, the combination with the rotatable shaft and the valve pivoted thereon, of an arm adjustably mounted on the shaft and rotating therewith, and spring devices intermediate the arm and the valve.

7. In a device of the character described, the combination with the rotatable shaft and the valve pivoted thereon, of an arm adjustable in a direction parallel to the shaft, means for adjusting said arm, and spring devices intermediate the arm and the valve, as set forth.

8. In a device of the character described, the combination with a conduit, of a shaft rotating therein, a disk, pivoted on said shaft and rotating therewith, spring devices arranged to hold the disk against centrifugal force, and spring devices to oppose the former, as set forth.

9. In a device of the character described, the combination with the rotatable shaft and the valve pivoted thereon, of an arm on the shaft, spring devices intermediate the arm and the valve, an adjustable collar on the shaft, and spring devices intermediate the collar and the valve, to oppose the first-mentioned spring, as set forth.

10. In a centrifugal governor, the combination with a passage for a fluid, of an automatic valve controlling said passage, adapted to be operated by its own inertia, as set forth.

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