

1,064,856.

Fig. 1.

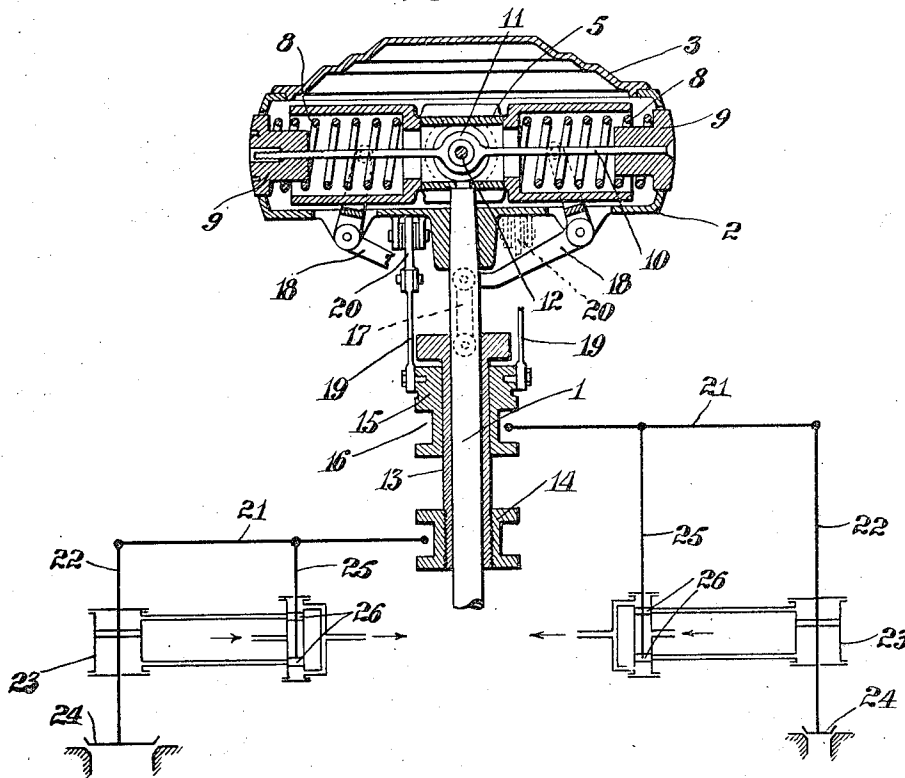
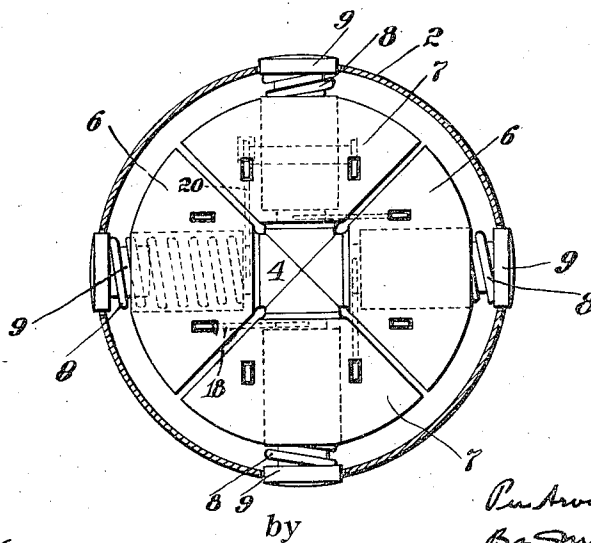


Fig. 2.



Attest:

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Attys

UNITED STATES PATENT OFFICE.

PER ARVID PETERSON, OF TRENTON, NEW JERSEY, ASSIGNOR TO DE LAVAL STEAM TURBINE COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

CENTRIFUGAL GOVERNOR.

1,064,856.

Specification of Letters Patent.

Patented June 17, 1913.

Application filed March 8, 1912. Serial No. 682,456.

To all whom it may concern:

Be it known that I, PER ARVID PETERSON, a subject of the King of Sweden, and a resident of Trenton, in the county of Mercer and State of New Jersey, have invented certain new and useful Improvements in Centrifugal Governors, of which the following is a specification.

My invention relates to improvements in centrifugal governors, and comprises, within a single governor structure, a plurality of sets of governing weights, rotating in unison but controlling independently separate valve controlling means.

My invention is particularly applicable to mixed pressure turbines, that is to say, turbines deriving working fluid from a plurality of sources; but my invention is also applicable to various other types of engines and machinery.

The object of my invention is to produce a simple and compact governor adapted to control independently a plurality of valves of valve-controlling means.

I will now proceed to describe my invention with reference to the accompanying drawings and will then point out the novel features in claims.

In said drawings: Figure 1 shows a central vertical section of a governor embodying my invention, the said view also indicating, diagrammatically, the independent control by said governor of a plurality of valve-controlling means. Fig. 2 shows a top view of the mechanism of the governor, the inclosing case of the governor being shown in horizontal section.

In the drawings 1 designates the governor shaft, arranged to be rotated by suitable means not shown, and 2 designates a casing mounted on said shaft, to rotate therewith, said casing comprising a removable cover 3. 4 designates a hollow spacing member, of cross shape, also mounted on shaft 1 and 6, 6 designate one set of governor weights and 7, 7 a second set of governor weights, all located within casing 2. As indicated, the weights 6, 6 and 7, 7 are of segmental form, and abut against the spacing member 5, there being suitable clearance between adjacent weights 6 and 7, as indicated. The weights 6 and 7 are also hollow, and within them are located the governor springs 8, there being one such spring for each weight. Abutments 9 for these springs 8 are mount-

ed to slide in suitable apertures in casing 2, and the springs 8 bear against the heads of these abutments and against the inner walls of the weights 6 and 7 respectively. The two abutments 9 of weights 6, 6 are connected by a tension rod 10 having a central apertured portion 11 through the aperture of which passes the tension rod 12 of the weights 7, 7. Each tension rod has at one end a head engaging one of the abutments 9, and at the other end has a threaded portion engaging a correspondingly threaded aperture of the other abutment 9; the construction being such, as will be seen, that the tension of the springs of each independent governor weight structure may be adjusted by rotating one of the abutments 9 of that structure.

A sleeve 13 is mounted upon shaft 1 to rotate therewith but to slide longitudinally thereon, and is provided with a flanged collar 14 adapted for engagement by the usual yoke of a valve-gear-control lever. Another sleeve, 15, is mounted to slide upon sleeve 13, and is provided with a groove adapted for engagement by another valve-gear-control lever. Sleeve 13 is connected by links 17 (one only of which is indicated in Fig. 1) and by bell crank levers 18 pivoted to governor casing 2, to the two weights 6; and sleeve 15 is connected by similar links 19 and bell cranks 20 (one of which bell cranks is in front of the plane of section of Fig. 1, and is therefore shown in dotted lines only in that figure) to weights 7.

It will be clear from the foregoing description that when shaft 1 rotates and casing 2 rotates with it, both weight-structures 6, 6 and 7, 7 will rotate with the shaft and will be subject to the same centrifugal forces, but that the springs of these two governor weight structures may have different tensions, and that the weights of one weight-structure may be of a weight different from that of the weights of the other weight structure, as required by particular circumstances, and that the one set of governor weights may move toward or from the center of rotation, independent of the other set of governor weights, so that each set of governor weights may control its particular valve-control mechanism independent of the control of another valve-control mechanism by the other set of governor weights. It will also be clear that each set of governor

weights is always in rotative balance with respect to shaft 1, and therefore that the entire governor weight structure is always in rotative balance with respect to said shaft.

- 5 In Fig. 1 I have indicated diagrammatically means for the control of valves by said independent governor weight structures, such means comprising levers 21, one adapted to engage collar 14, the other to engage sleeve 15, said levers 21 pivoted to piston rods 22 of suitable valve-actuating fluid-pressure cylinders 23, the said piston rods 22 being also connected to lift-valves 24, and the levers 21 being also connected by valve-rods 25 to suitable slide pilot-valves 26 arranged to control the supply of fluid under pressure to cylinders 23 and therefore to effect movement of the pistons of cylinders 23 when the governor, for any reason, changes the positions of levers 21.

It will be obvious that since both weights of each set or weight-structure are connected, by similar levers to the same valve-control means (sleeve 13 or sleeve 15), the two weights of each weight-structure are always in rotative balance, and move inward and outward simultaneously and to the same extent.

What I claim is:—

- 30 1. A centrifugal governor comprising a rotary weight-carrier, a plurality of independent weights mounted thereon to move toward and from the center of rotation thereof, independent governor-springs for said independent weights, independent valve-control means for said independent weights, and means for transmitting motion from each of such independent weights to the corresponding valve-control means.

- 40 2. A centrifugal governor comprising a rotary weight-carrier, a plurality of independent weight-structures mounted thereon to move toward and from the center of rotation thereof, each such weight structure comprising a plurality of weights in rotative balance with respect to one another, independent governor-springs for said separate weight-structures, independent valve-control means for said independent weight-structures, and means for transmitting motion from each of such independent weight-structures to the corresponding valve-control means.

- 55 3. A centrifugal governor comprising a rotary weight-carrier, a plurality of independent weight-structures, said weight structures each comprising a plurality of oppositely-disposed weights in rotative balance, spacing means on said carrier adapted to space the weights apart, independent

governor springs for said independent weight-structures, independent valve-control means for said independent weight-structures, and means for transmitting motion from each of such independent weight-structures to the corresponding valve-control means.

4. A centrifugal governor comprising a rotary weight-carrier, spacing means carried thereby, a plurality of sets of governor weights, each set comprising two weights located respectively on opposite sides of said spacing means, a separate spring for each such weight, abutments for said weights, each spring acting against one of said weights and against one of said abutments, a tension rod, for each such set of weights, each such tension rod having a screw-thread connection with one of said abutments, for the adjustment of spring-action, one of said tension rods having, near the center of rotation, an aperture through which passes the tension rod of another of said sets of weights, and means for transmitting inward and outward motion of the weights of each set to valve-control means.

5. A centrifugal governor comprising a rotary weight-carrier, hollow spacing means carried thereby, a plurality of sets of governor weights arranged about said spacing means, each such set comprising two governor weights located respectively on opposite sides of said spacing means, each such weight having a spring-chamber within it, abutments for said weights, located in proximity to the outer ends of such spring chambers, a spring for each such weight, located within the spring chamber of that weight, and acting against said weight and against the corresponding abutment, tension rods connecting the abutments of corresponding weights, and means for transmitting inward and outward motion of the weights of each such set to valve control means.

6. A centrifugal governor comprising in combination a rotary carrier and a plurality of independent centrifugal governing-means carried thereby, and separate valve-control means for such independent centrifugal governing means, each such valve control means operatively connected to its corresponding governing means.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

PER ARVID PETERSON.

Witnesses:

E. S. ROSS,

H. M. MARBLE.