No. 784,333. PATENTED MAR. 7, 1905.

H. KRONER.

GOVERNOR.

APPLICATION FILED JULY 2, 1904.

2 SHEETS—SHEET 1.

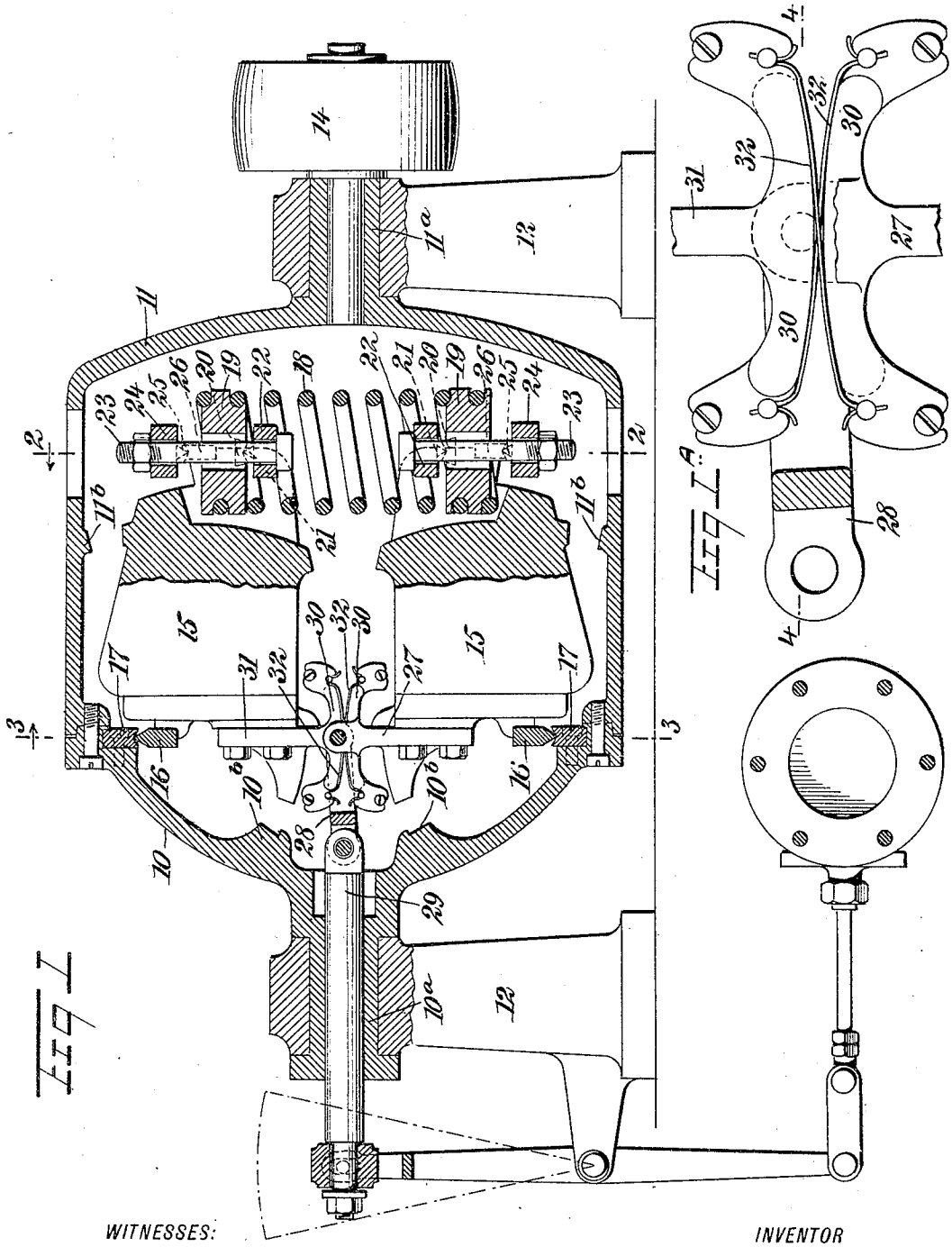


FIG. 1

FIG. 1a

WITNESSES:

A. Walker

Isaac B. Owens.

INVENTOR

Hermann Kroner

BY Munn & Co

ATTORNEYS

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2 SHEETS—SHEET 2.

Fig 2

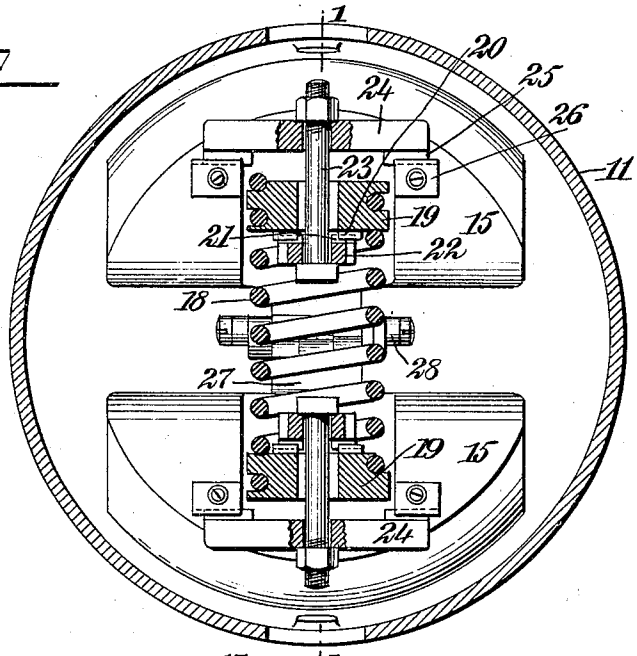


Fig 3

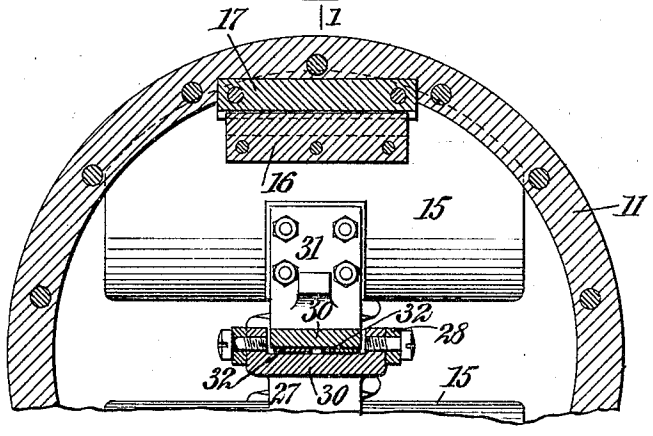
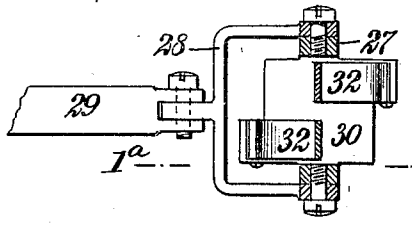


Fig 4



WITNESSES:

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No. 784,333. Patented March 7, 1905.

UNITED STATES PATENT OFFICE.

HERMANN KRONER, OF BALTIMORE, MARYLAND.

GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 784,333, dated March 7, 1905.

Application filed July 2, 1904. Serial No. 215,170.

To all whom it may concern:

Be it known that I, HERMANN KRONER, a subject of the German Emperor, and a resident of Baltimore, in the State of Maryland, have invented a new and Improved Governor, of which the following is a full, clear, and exact description.

The invention relates to a centrifugal governor adapted particularly for use in connection with turbines, but useful with various other machines, as will be apparent.

The prime object of the invention is to so arrange the centrifugally-actuated part or parts that the movement thereof will be attended by the least possible friction, thus increasing the sensibility of the governor, permitting it to respond effectually to any slight variations in the speed of the driving apparatus. I attain this end by certain novel features of structure and organization, which will be fully set forth hereinafter and pointed out in the claims.

Reference is had to the accompanying drawings, forming part of this specification and illustrating as an example one embodiment of my invention, in which drawings like letters of reference indicate like parts in the several views, and in which—

Figure 1 is a longitudinal section of the governor essentially on the line 1 1 of Fig. 2. Fig. 1^A is an enlarged detail sectional view on the line 1^a 1^a of Fig. 4, showing the frictionless connection between the centrifugally-actuated weights. Fig. 2 is a cross-section on the line 2 2 of Fig. 1. Fig. 3 is a fragmentary cross-section on the line 3 3 of Fig. 1, and Fig. 4 is a sectional plan on the line 4 4 of Fig. 1^A.

According to the example of the invention here given the moving parts are inclosed in a case formed of two sections 10 and 11, suitably fastened together and revolubly mounted through the medium of tubular journals 10^a and 11^a, carried in supports 12. 14 may be taken to indicate a band-pulley, through the medium of which the case may be revolubly driven. Within the case are arranged two weights 15, provided with knife-edges 16, rockably mounted on corresponding bearing-plates 17, located within the case, said weights being arranged to swing around axes coincident with the edges of the knives 16 through an arc of movement limited by abutments 10^b and 11^b, formed on the interior walls of the case. The weights 15 are held yieldingly in the intermediate position shown in Fig. 1 by a spring 18. This spring is helical or spiral and has its end portions engaged in corresponding grooves formed in blocks 19, said blocks acting essentially as nuts, and by adjusting the spring on the blocks the tension of the spring may be regulated at will to regulate the governor, as will be understood. Said nuts or blocks 19 have wear-plates 20 secured thereto and engaged by knife-edges 21, attached to rings 22. Said rings are engaged by bolts 23 to extend outward through the nuts 19 and have their outer ends engaged with cross-bars 24, which are connected with the respective weights 15 through the medium of knife-edges 25, engaged with wear-plates 26, secured to the weights. It will be observed that by these means the spring 18 is connected with the weights, so as to exert on them the necessary restraining influence and at the same time to eliminate for all practical purposes any friction incident to the swinging movement of the weights relatively to the spring. One of the weights has a fork 27 attached thereto, and this fork is pivoted to a horizontally-disposed fork 28, in turn connected with a sliding rod 29, extending through the hollow journal 10^a and serving to transmit to the part being actuated the movement of the governor. The weights 15 are connected to move in unison by means of arc-shaped members 30, connected, respectively, to the fork 27 and to bracket 31, attached to the weight not having the fork. The arc-shaped members 30 have their arc-shaped faces opposing each other, and these members are connected by flexible metallic bands 32, each band having one end attached to one of the members 30 and closing over with its other end in connection with the other arc-shaped member 30. With this device the parts 15 are positively connected, yet movement is allowed and transmitted without friction of any sort.

As the governor is rotated and the weights move outward under centrifugal force they

rock around the center of the edges of the blades 16, expanding the spring 18. The swinging movement of the weight having the fork 27 is directly transmitted through the fork 28 to the rod 29, and the swinging movement of the other weight is transmitted through the straps or bands 32. It will be observed that the weights are not hung on journals or pivots and are consequently free from the friction incident to these members. They are merely suspended between the knife-edges, and their movement produces nothing more than a rolling movement of the knife-edges, which will be without friction, as will be understood.

Various changes in the form, proportions, and minor details of my invention may be resorted to at will without departing from the spirit and scope thereof. Hence I consider myself entitled to all such variations as may lie within the terms of my claims.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A governor having two weights, and means for movably mounting the same, said means comprising knife-edges and members engaged therewith, and a connection between the weights.

2. A governor comprising two weights, means for movably mounting the same, comprising knife-edges and coacting members engaged therewith, said mounting means being located at the outer portions of the weights causing them to move in unison, and a connection between the inner portions of the weights causing them to move in unison.

3. A governor comprising two weights, means for movably mounting the same, comprising knife-edges and coacting members engaged therewith, said mounting means being located at the outer portion of the weights, a connection between the inner portions of the weights causing them to move in unison, and means for yieldingly holding the weights in inactive position.

4. A governor comprising two weights, means for movably mounting the same, comprising knife-edges and coacting members engaged therewith, said mounting means being located at the outer portions of the weights, a connection between the inner portions of the weights, a spring, and means for connecting the spring with the weights, said means comprising knife-edges and coacting members engaged therewith.

5. A governor comprising two centrifugally-actuated weights movable from and toward each other, a spring, and means connecting the ends of the spring respectively with the weights, said means comprising knife-edges and coacting members engaged with the knife-edges.

6. A governor having a movable weight, a spiral or helical spring, a correspondingly-grooved block loosely engaged with the spring, and means for connecting the block with the weight.

7. A governor having a movable weight, a spiral or helical spring, a correspondingly-grooved block loosely engaged with the spring, and means for connecting the block with the weight, said means comprising a knife-edge and a member engaged therewith.

8. A governor having a movable weight, a spiral or helical spring, a correspondingly-grooved block loosely engaged with the spring, means for connecting the block with the weight, said means comprising a knife-edge engaged with the member, a ring mounting the knife-edge, a bolt engaged with the ring, a cross-bar engaged with the bolt, and knife-edges at the ends of the cross-bar and engaged with the weight.

9. A governor having a movably-mounted weight, a spring, a member in connection with the spring, a knife-edge engaged with the member, a ring carrying the knife-edge, a bolt connected to the ring, a cross-bar engaged with the bolt, and a knife-edge on the cross-bar and engaged with the weight.

10. A governor comprising two movable weights, means for transmitting the movement of the governor, said means being in direct connection with one weight, and a connection between the weights.

11. A governor comprising two weights, a member directly connected with one weight to transmit the movement thereof, and a flexible connection between the two weights.

12. A governor comprising two weights, and flexible bands having their ends respectively connected with the weights, the bands crossing each other to transmit swinging movement from one weight to the other in either direction.

13. A governor comprising two swinging weights having arc-shaped members connected therewith, and crossing flexible bands having their ends respectively connected with the arc-shaped members to transmit movement from one weight to the other in both directions.

14. A governor having a support, a weight movably mounted thereon, and means connecting the weight with the support, and including a spiral or helical spring and a correspondingly-grooved block in the groove of which the said spring is engaged.

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

HERMANN KRONER.

Witnesses:
FREDERICK FINKS,
HARRY M. LINDSAY.