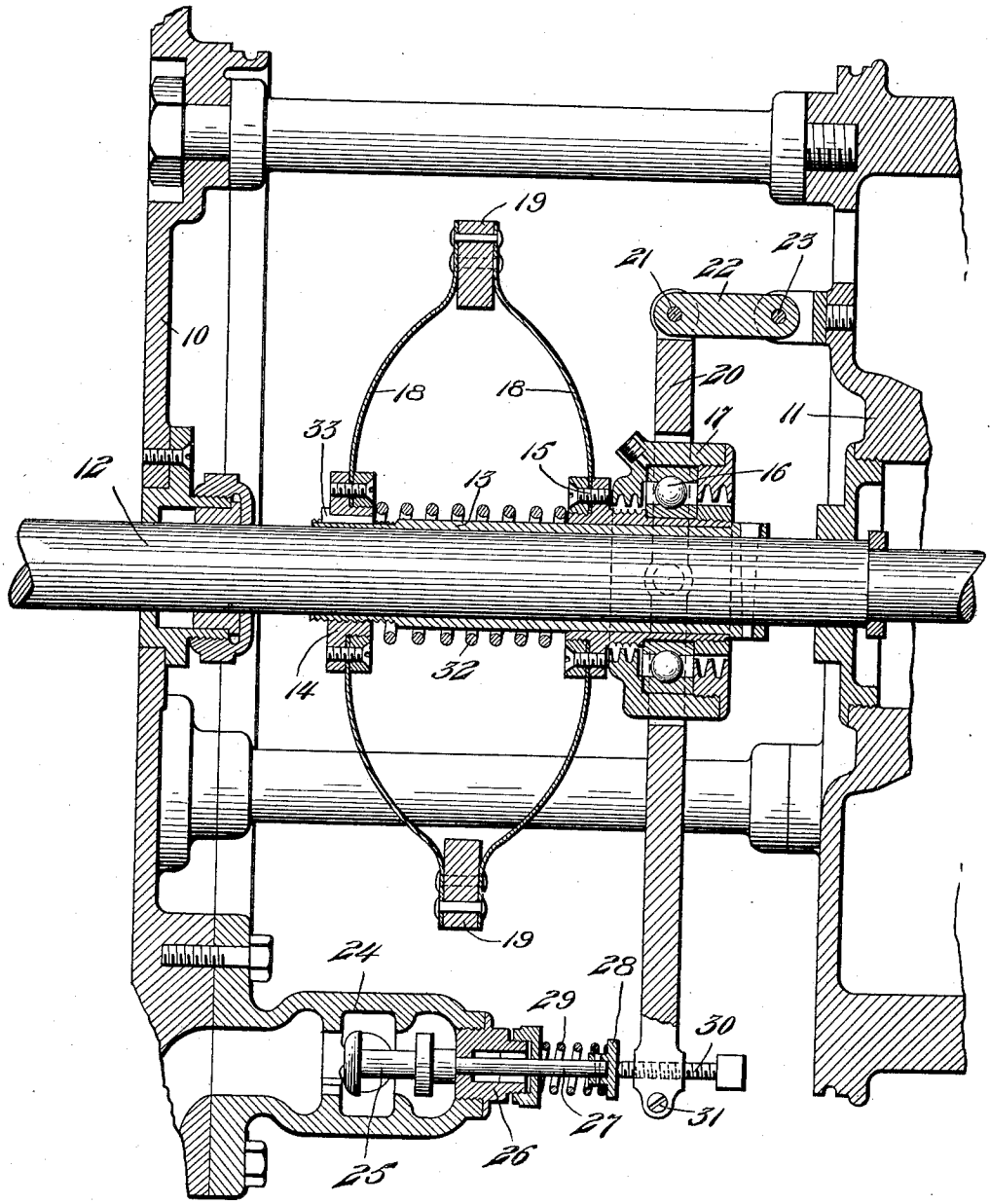
R. P. DEARDORFF.

SPEED GOVERNING MECHANISM.

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Witnesses

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SPEED-GOVERNING MECHANISM.

1,082,225. Specification of Letters Patent. Patented Dec. 23, 1913.

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To all whom it may concern:

Be it known that I, RAY P. DEARDORFF, a citizen of the United States, and resident of Buffalo, county of Erie, State of New York, have invented certain new and useful Improvements in Speed-Governing Mechanism, of which the following is a specification.

This invention relates to speed governing mechanism and more particularly to mechanisms for controlling high speed fluid pressure motors within narrow limits of accuracy.

The objects of the invention are to provide a mechanism of this class which is readily adjustable for the purpose of varying the maintained speed, which is simple in construction and which will be instantaneously responsive to all changes in speed of the motor.

The invention is illustrated in the accompanying drawing which is a section through a portion of a fluid pressure turbine which is directly connected with an electric generator.

Referring to the drawing: 10 indicates the casing of the turbine and 11 the casing of the generator. A shaft 12, which carries the turbine wheel and the rotor of the generator, has secured thereon a sleeve 13 which is provided with a threaded end portion for an adjustable collar 14. A slidable collar 15 is also arranged on the sleeve 13 and carries a ball bearing 16 on which is mounted a non-rotatable collar 17. The collars 14 and 15 rotate with the shaft 12 and have secured thereto leaf springs 18 which extend transversely of the shaft 12 on opposite sides thereof. Each of the springs 18 is provided with a central opening through which the shaft 12 passes and the springs have their adjacent ends secured together and carry centrifugal weights 19. The springs are continuously curved, from the collars to which they are attached, to points adjacent the weights 19, where they are reversely curved to lie against the sides of the weights.

As will be readily understood, when the shaft 12 is rotated at high speed the weights 19 will move outwardly, and to some extent axially, the springs 18 being flattened out to a certain extent by the centrifugal forces acting on the weights. The springs are flexed throughout the whole distance from the collars to the weights with the result that they will be instantly responsive to changes in speed of the shaft.

I am aware that governors of this type have been provided heretofore, such as is shown in the patent to Procunier, No. 994,535, but the springs in the governors heretofore used have been straight or flat between the collars, to which they are attached, and the weights, with the result that the flexing is limited to the region of the bends adjacent the collars and the weights. I have found that springs made in the manner shown in the patent above referred to are not so responsive as springs made in accordance with my invention and I believe this to be due to the fact that the flexing, in the prior constructions, being limited to the region of the bends adjacent the collars and weights produces a longer moment arm through which the spring forces act on the slidable collar.

A lever 20 having a portion surrounding and pivoted to the collar 17 is fulcrumed at 21 on a link 22 which is pivoted to the generator casing at 23, this link permitting the lever 20 to move longitudinally as it moves with the collar 17. A valve casing 24, provided with a valve 25 for controlling the supply of motive fluid to the turbine, has a stuffing box 26 through which the stem of the valve projects. The valve stem carries on its outer end an abutment or cap 28 and between this cap and the stuffing box is arranged a spring 29 which is adapted to move the valve in one direction. The end of the lever 20 is bifurcated and threaded to receive an adjustable screw 30, the screw being secured in position by means of a clamping bolt 31. The screw 30 loosely engages the cap 28 so that the lever 20 is free to move away from the cap. The spring 29 normally holds the cap 28 in contact with the screw 30 and effects the opening movement of the valve, thus relieving the speed-responsive element.

In order to assist the springs 18 in resisting the centrifugal forces on the weights 19 I have provided a helical spring 32 which surrounds the sleeve 13 and is arranged between and engages the collars 14 and 15. It will be clearly understood from the drawing that the spring 32 opposes movement of the collar 15 toward the left and aids the springs 18 in moving the collar and the lever 20 in the opposite direction. The spring 32, however, is subordi-

nate to the springs 18, the latter springs being most responsive to changes in speed.

This governing mechanism was devised to meet the requirements of service in connection with a fluid pressure turbine operating a generator which supplies current to a locomotive arc lamp. The arc lamp being the only load on the generator produces a condition in which the full load is frequently thrown on and off, due to the action of the carbons of the lamp, and it will be seen that this condition requires a speed-responsive control mechanism of the utmost sensitiveness. When the load is thrown off, the turbine increases in speed momentarily and effects a closing movement of the valve 25. When the load is thrown on the generator there is a momentary reduction in the speed of the turbine which causes the screw 30 to move toward the right in the drawing. Since the lever 20 is not connected with the valve 25 but little force is required to move the lever 20 and therefore the speed-responsive element will instantly shift the lever and permit the spring 29 to open the valve.

The collar 14 is secured against rotation on the sleeve 13 by means of a key 33 and the collar 14 is usually adjusted to control the turbine at approximately the required speed, the final adjustments in order to control the turbine at the exact speed being effected by means of the screw 30.

Having thus described my invention what I claim is:

1. In speed governing mechanism, the combination of a speed-responsive element, a lever connected with and positively oscillated by said speed-responsive element, a valve-actuating member, and a spring for moving said valve-actuating member in one direction, said lever loosely engaging said member and being adapted to move the same only in opposition to said spring and there being means for adjustment at one end of the lever.

2. In speed governing mechanism, the combination of a speed-responsive element, a lever connected with and actuated by said speed-responsive element, a valve-actuating member, a spring for moving said valve actuating member in one direction, and adjustable means loosely connecting said lever and said member whereby the lever is adapted to move the member only in opposition to said spring.

3. In speed governing mechanism, the combination of a speed-responsive element, a lever connected with and actuated by said speed-responsive element, a valve-actuating member, a valve, an axially movable rod connected with the valve, a spring surrounding said rod and adapted to move the same to open the valve, and an adjustable screw forming a connection between said lever and said rod whereby the lever is adapted to move the rod in opposition to the spring and is free to move independent thereof in the opposite direction.

In testimony whereof I affix my signature in presence of two witnesses.

RAY P. DEARDORFF.

Witnesses:
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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."