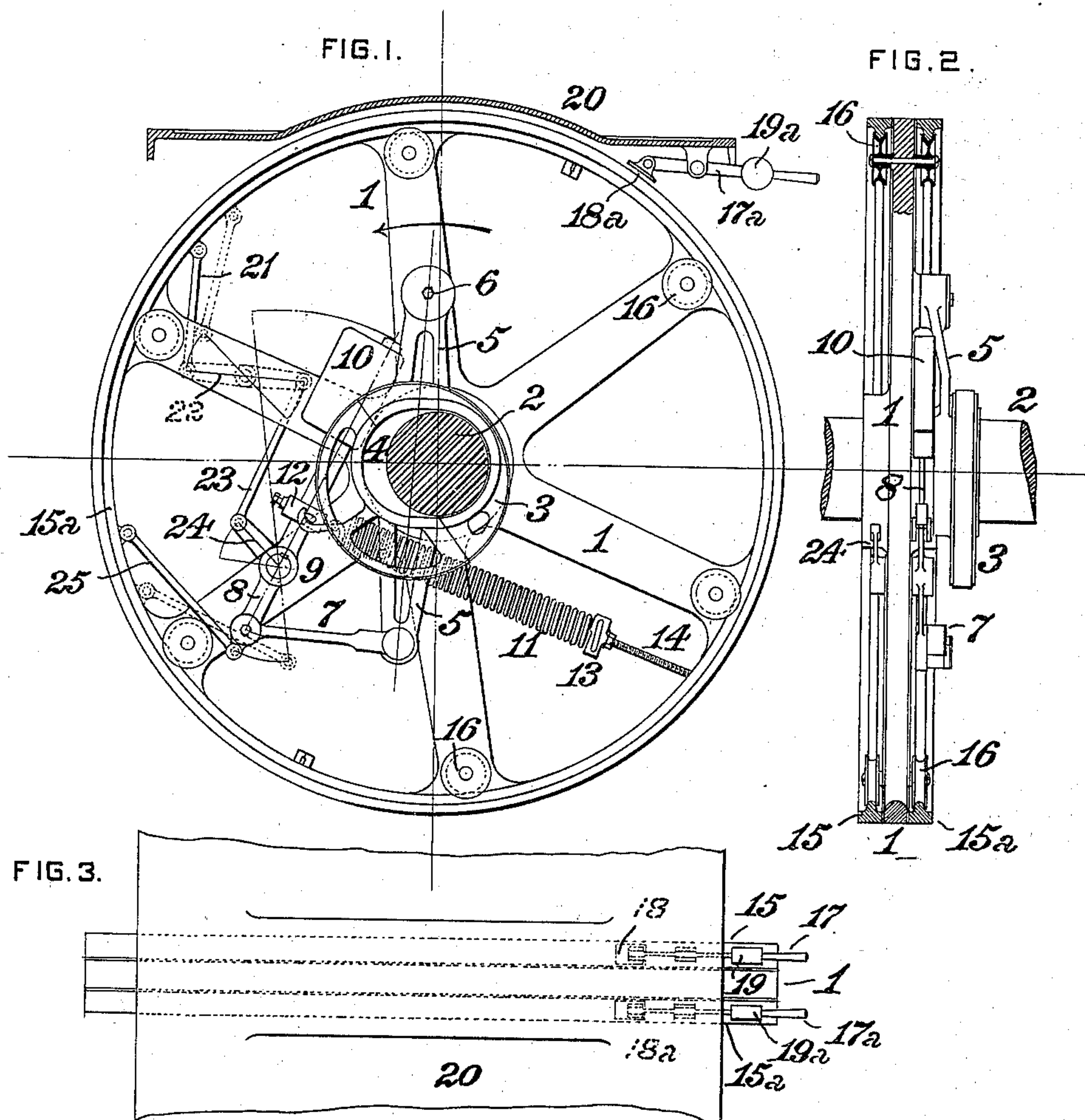


(No Model.)

E. F. WILLIAMS.  
FLUID MOTOR GOVERNOR.

No. 605,241.

Patented June 7, 1898.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

EDWIN F. WILLIAMS, OF NEW YORK, N. Y.

## FLUID-MOTOR GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 605,241, dated June 7, 1898.

Application filed March 9, 1897. Serial No. 626,662. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN F. WILLIAMS, of the city, county, and State of New York, have invented a certain new and useful Improvement in Fluid-Motor Governors, of which improvement the following is a specification.

My invention relates to governors for steam or other fluid-pressure engines of the general class or type frequently termed "shaft-governors," in which an adjustable eccentric is varied and controlled in position by the opposing action of a centrifugally-acting weight and of a spring for the purpose of regulating the speed of the engine by varying the point of cut-off correspondingly with variations in pressure or load, or both.

The object of my invention is to provide, in a governor of the above type, simple and efficient means whereby the speed of the engine controlled by the governor may be temporarily increased or diminished and thereafter reinstated to its normal rate, as may from time to time be desired.

The improvement claimed is hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a side view of a governor, illustrating an embodiment of my invention; Fig. 2, a transverse central section, partly in elevation, through the same; and Fig. 3, a plan or top view.

My invention is designed for the purpose of temporarily adjusting the speed of one engine to that of another engine or engines during such periods as may be required and thereafter enabling the engine to be immediately restored by the governor to its normal speed, and it is of special applicability where two or more engines are used for driving alternating-current generators.

Assuming two five-hundred-horse-power engines to be located in the same or different stations, in the afternoon or early evening one of them is started, and when the heavy work comes on later in the evening both engines are required. The second engine is then started, and when speeded up the conditions may be as follows: The two engines both running with throttles wide open, the governors similarly isochronous and speeded the same, one engine being loaded and the

other light, the former would run slower than the latter. Now before the light one can be switched into the common circuit the voltage of its generator must be the same on the loaded engine. In order to bring it down to this, it is manually speeded down by my invention until its speed conforms to that of the other engine. The switch may then be thrown and the speeding device released, when the two engines will work on a common load, and as the "setting" on the governors has not been varied in any way each engine will take its share of the work. As it may be necessary in some cases to bring the full loaded engine to the speed of the lightly-loaded engine, in order to throw the engines into a common circuit, my invention provides means for either temporarily increasing or decreasing the speed of the engine.

My invention is herein illustrated as applied in connection with a governor the operative members of which are mounted and supported upon a wheel or carrier 1, secured upon a shaft 2, which may either be the main or crank shaft of the engine or a counter-shaft rotated therefrom. An adjustable eccentric 3, in which is formed a transverse opening or passage 4 of sufficient width to clear the shaft 2 and sufficient length to allow the required traverse of the eccentric transversely thereto, is connected to an arm 5, one end of which is journaled by a pin, the center of which is shown at the point 6, to the wheel or carrier. The arm 5 is prolonged on the opposite side of the eccentric 3 and is coupled by a link 7 to one end of a weight-arm 8, which carries on its opposite end a centrifugally-acting weight 10 and is pivoted between its ends by a journal 9 to the wheel or carrier 1. A spring 11, the tension of which is exerted in opposite direction to the action of the weight 10 under centrifugal force, is hooked at one end to a block 12, which is longitudinally adjustable upon the weight-arm 8, and its opposite end is connected to a block 13, carrying a nut which engages a screw 14, connected to the rim of the wheel or carrier.

Under the above construction, which in its essential structural and operative features does not substantially differ from automatic cut-off governors heretofore known in the art



and is not, therefore, claimed as of my present invention, outward movement of the weight-arm and weight 10, due to the action of centrifugal force, moves the eccentric toward the center of the shaft, thereby reducing its throw and effecting shorter cut-off, and inward movement of the weight-arm and weight, due to the tension of the spring, moves the eccentric away from the center of the shaft and toward its position of greatest eccentricity or throw, (shown in Fig. 1,) thereby correspondingly effecting longer cut-off.

In the practice of my invention I supplement the mechanism above described as a basis or any other governing mechanism of the same general type by the application thereto of frictional mechanism and connections by which the normal throw of the eccentric may be periodically and temporarily increased or diminished without intermitting the operation of the governor, in order during such periods to increase or diminish the speed of the engine, as may be desired. The drawings illustrate one form of mechanism by which this operation may be effectively performed.

In the construction shown two friction-rings 15 15<sup>a</sup>, the diameters of which are most conveniently made substantially the same as that of the wheel or carrier 1, are mounted and supported on opposite sides thereof in such manner as to rotate therewith, each having the capacity of a limited degree of circumferential movement relatively thereto. For this purpose sheaves or grooved pulleys 16 are journaled on the opposite sides of the wheel or carrier and engage annular inward projections on the friction-rings 15 15<sup>a</sup>, thereby serving as supports for the same, which admit of their circumferential movement, while preventing their displacement in direction parallel to the shaft 2. Brake-levers 17 17<sup>a</sup>, carrying brake-shoes 18 18<sup>a</sup> and counterbalances 19 19<sup>a</sup>, are pivoted to a fixed support 20, adjacent to the rims of the friction-rings 15 15<sup>a</sup>, in such relation thereto that both brake-shoes will be normally held out of contact with the friction-rings; but either may be applied to the adjacent friction-ring when desired by the proper movement of the brake-lever to which it is connected.

The friction-rings 15 15<sup>a</sup> and brake levers and shoes constitute a frictional mechanism or device the action of which as effected and regulated by an operator and transmitted to the eccentric 3 through suitable connections is to increase or reduce the throw of the eccentric, as the case may be. To this end the friction-ring 15 is coupled by a link 21 to one end of a double-armed lever 22, which is pivoted at its middle to the wheel or carrier 1, and the opposite end of the lever 22 is coupled by a link 23 to an arm 24, projecting in the direction of the weight 10 from the journal 9 of the weight-arm 8. The friction-ring 15<sup>a</sup> is coupled by a link 25 to the outer end of the weight-arm 8.

It will be readily seen that through the connections substantially as above described the retardation of either of the friction-rings 15 15<sup>a</sup> relatively to the wheel or carrier 1 by the application of the adjacent brake-shoe thereto will effect coincident movement of the weight-arm and connected eccentric and that such movement will be in one or the other direction, accordingly as one or the other friction-ring is acted upon by its brake lever and shoe. In the construction shown, the governor being supposed to rotate in the direction of the arrow in Fig. 1, the retardation or relative backward movement of the friction-ring 15 will, through the connections 21, 22, 23, and 24, move the upper end of the weight-arm 8 outwardly, and consequently decrease the throw of the eccentric and the period of fluid admission to the cylinder. The retardation or relative backward movement of the friction-ring 15<sup>a</sup>, on the other hand, will, through the link 25, move the lower end of the weight-arm 8 outwardly, and consequently increase the throw of the eccentric and the period of fluid admission to the cylinder. The effect in the first case will be to diminish the normal speed of rotation of engine and in the second to increase it. Upon the release of the brake-shoe from either of the friction-rings the speed of the engine will be coincidentally reinstated to the normal degree.

My improvement is capable of ready and inexpensive application in connection with automatic cut-off governors of any of the ordinary constructions and is advantageous and desirable under many conditions of service in which it is required to temporarily increase or reduce the ordinary or normal rotative speed of an engine—as, for example, in speeding two or more engines at exactly the same rate as is necessary when the electric generators driven by them are to be thrown into the same circuit, or in the case of a single engine to change its speed to comply with temporary conditions of the work imposed upon it.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, substantially as set forth, of an automatic cut-off governor, an adjustable eccentric controlled thereby, a frictional mechanism for effecting the retardation of speed of a member rotating with the governor and independent thereof, and independently-operable and oppositely-acting connections from said frictional mechanism to the eccentric.

2. The combination, substantially as set forth, of an automatic cut-off governor, an adjustable eccentric controlled thereby, sheaves journaled on the carrier or frame of the governor, a frictional ring mounted freely upon said sheaves, connections coupling said frictional ring with the eccentric, and a brake-lever fitted to apply resistance to the frictional ring.

3. The combination, substantially as set



forth, of an automatic cut-off governor, an  
adjustable eccentric controlled thereby, two  
frictional rings fitted to rotate with the gov-  
ernor, each having the capacity of independ-  
5 ent circumferential movement thereon, con-  
nections coupling the frictional rings, in op-  
posite directions, to the eccentric, and means

for applying resistance to either of the fric-  
tional rings.

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Witnesses:

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