No. 763,572. PATENTED JUNE 28, 1904.

D. W. STARRETT.

WATER WHEEL GOVERNOR.

APPLICATION FILED FEB. 26, 1903. RENEWED DEC. 7, 1903.

NO MODEL.

Fig. 1.

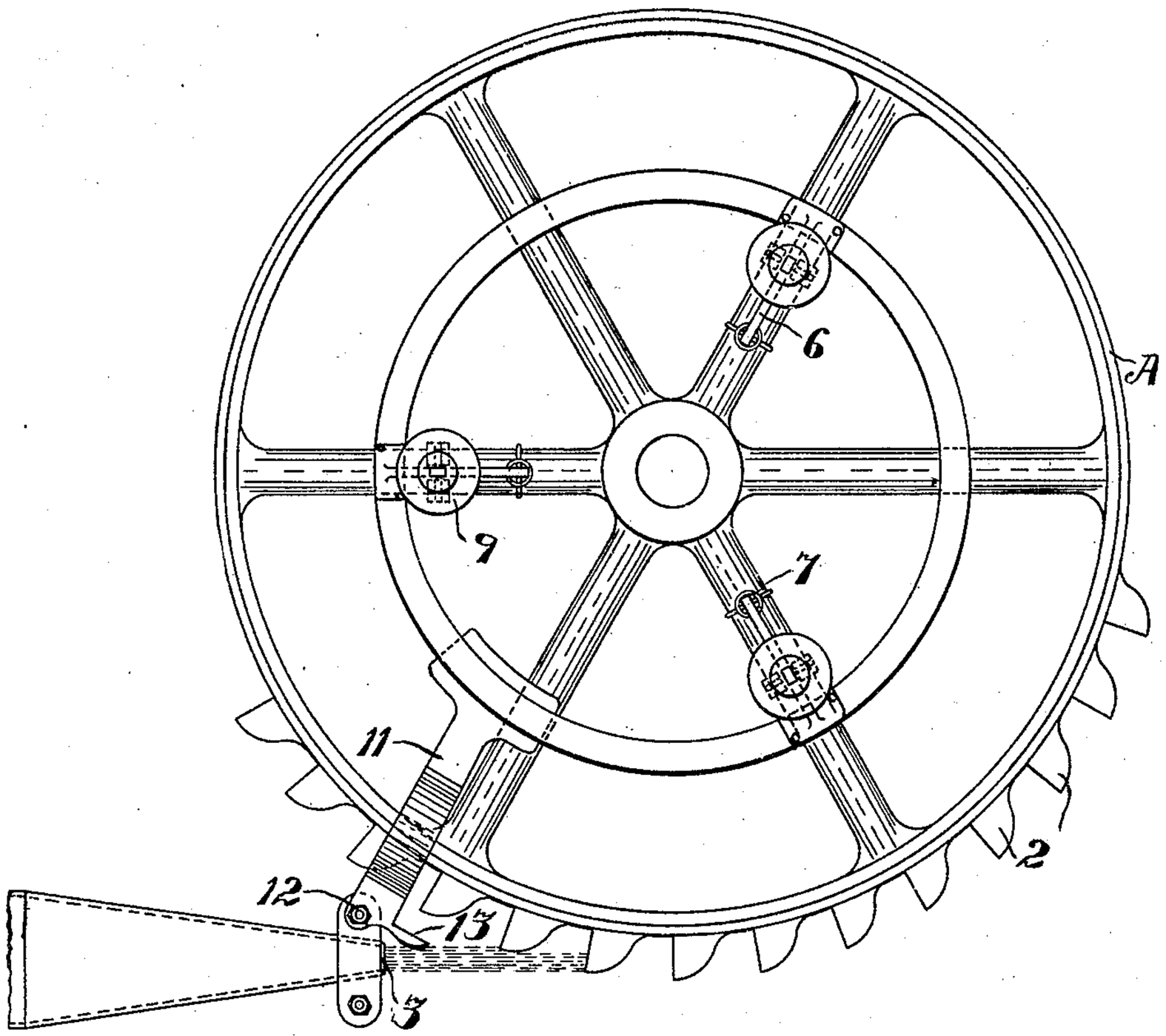
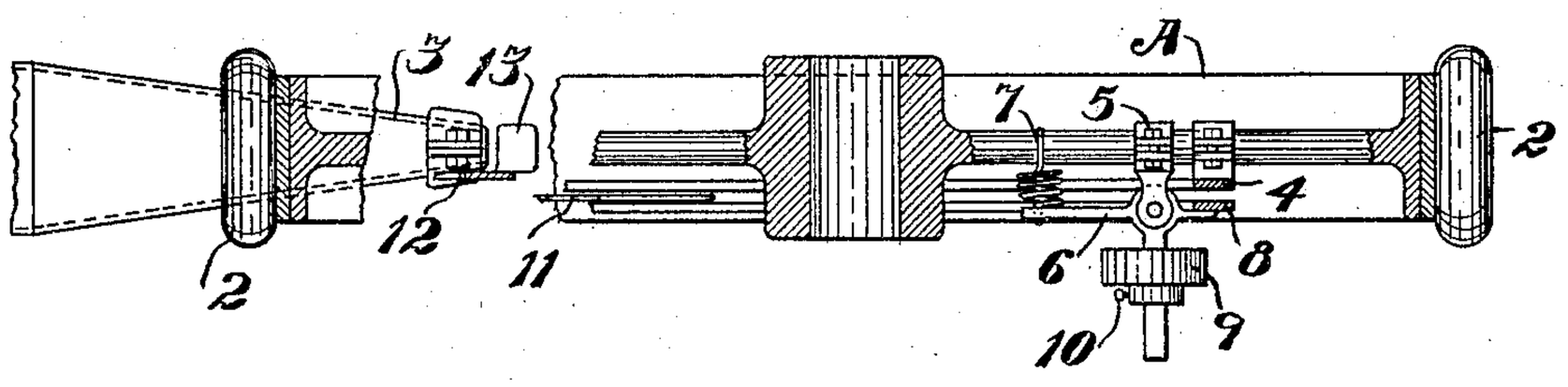


Fig. 2.



Witnesses,
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Dudley Moss.

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Atty

No. 763,572. Patented June 28, 1904.

UNITED STATES PATENT OFFICE.

DANVILL W. STARRETT, OF OAKLAND, CALIFORNIA, ASSIGNOR OF THREE-FOURTHS TO FREDERICK D. NOWELL, OF JUNEAU, ALASKA TERRITORY.

WATER-WHEEL GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 763,572, dated June 28, 1904.

Application filed February 26, 1903. Renewed December 7, 1903. Serial No. 184,227. (No model.)

To all whom it may concern:

Be it known that I, DANVILL W. STARRETT, a citizen of the United States, residing in Oakland, county of Alameda, State of California, have invented an Improvement in Water-Wheel Governors; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in means for maintaining a water-wheel at a constant rate of speed irrespective of variations in load.

In milling and other operations where power is derived from the impact of a stream of water under high head upon buckets carried on the periphery of a wheel there is always a tendency for the rate of speed of the wheel to vary according as the load is greater or less. For instance, a particular wheel operating under a certain head of water and adapted to run at a normal speed when carrying a maximum load will, if otherwise unretarded, increase that speed and "race" as the load is diminished with unsatisfactory if not disastrous consequences.

My invention consists in the parts and the construction and combination of parts hereinafter more fully described, having reference to the accompanying drawings, in which—

Figure 1 is an elevation of a water-wheel embodying my invention. Fig. 2 is a sectional plan view partially broken away.

A represents a water-wheel of suitable construction, having the peripheral buckets 2 movable in the plane of and tangential to the path of discharge from the stationary nozzle 3, through which water under a suitable head is delivered to drive the wheel in the manner well known in the art. A ring or annular brake-shoe 4 is secured to the spokes of the wheel concentric with the latter. At suitable intervals within the shoe studs or brackets 5 are bolted to the spokes, and a three-arm lever 6 is fulcrumed in each of these studs, having two of its arms standing in the line of a wheel radius and the third extending outwardly at right angles to the plane of the wheel. The innermost arm of a lever is held in normal position close to the spokes by means of a spring 7. The outer arm carries on its inner side a ring or annular brake-shoe 8, concentric with the wheel-shaft and of equal radius with shoe 4. The third arm, which extends approximately at right angles to the other two, carries a weight 9, which is adjustable on the arm by a set-screw 10. When the wheel is revolved, the natural tendency of the weights is to fly outwardly, causing the levers to oscillate and carry ring 8 in toward ring 4, which is fixed to the spokes. This lateral movement of ring 8 is utilized to control the impact of the water column on the buckets by means of a lever or brake 11, having an extended bearing part interposed between the two rings, but out of the path of the studs 5. The brake is fulcrumed at a fixed point, as 12, adjacent to the nozzle-discharge and has a curved deflecting-plate 13 normally resting on the surface of the discharging column. If the speed of the wheel increases beyond a predetermined point, the weights fly outward in obedience to the well-known law of nature and cause ring 8 to impinge upon the brake-lever, and by reason of the frictional contact of the two rings with the lever oscillate it to press plate 13 down upon the water column and deflect the latter, lessening the force of the impact on the buckets and checking the speed of the wheel. The rings form, in fact, a friction-clutch for the brake. The position of the weights 9 is adjusted to the tension of springs 7, and the maximum rate of speed of the wheel will be greater or less, according as the weights, which should always be in the same plane, are more or less removed from the plane of the wheel.

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

1. The combination with a water-wheel having peripheral buckets, of a governor comprising a deflector movable in relation to the discharge-nozzle and adapted to impinge upon the surface of the impelling column, a clutch mechanism carried by the wheel, and actuat-

ing means in connection with the deflector extending into the path of said clutch mechanism.

2. The combination with a water-wheel having peripheral buckets, of a governor comprising an annular shoe fixed to the wheel, a counterpart shoe carried by the wheel and having a lateral movement in relation to the first-named shoe, a brake interposable between said shoes, and means for deflecting the impelling fluid column operatable by the movements of the brake.

3. The combination with a water-wheel provided with peripheral buckets, and a nozzle having a discharge tangential to the wheel, of a ring fixed to and concentric with the wheel, weighted spring-pressed levers carried by the wheel, a ring supported by and turnable with said levers and having a lateral movement in relation to the first-named ring, a brake-lever interposable between the rings and a deflector carried by said brake-lever and adapted to impinge upon the surface of the impelling fluid column.

4. The combination with a water-wheel having peripheral buckets, of a discharge-nozzle, a ring fixed to and concentric with the wheel, radially-disposed spring-pressed levers carried by the wheel, a ring carried by said levers, said rings forming opposed clamp members, the levers having arms extending outwardly from the plane of the wheel, weights adjustable on said arms, a deflector movable in relation to the nozzle-discharge, and operating means in connection with said deflector interposable between said clamp-rings.

In witness whereof I have hereunto set my hand.

DANVILL W. STARRETT.

Witnesses:

A. J. HENRY,

S. H. NOURSE.