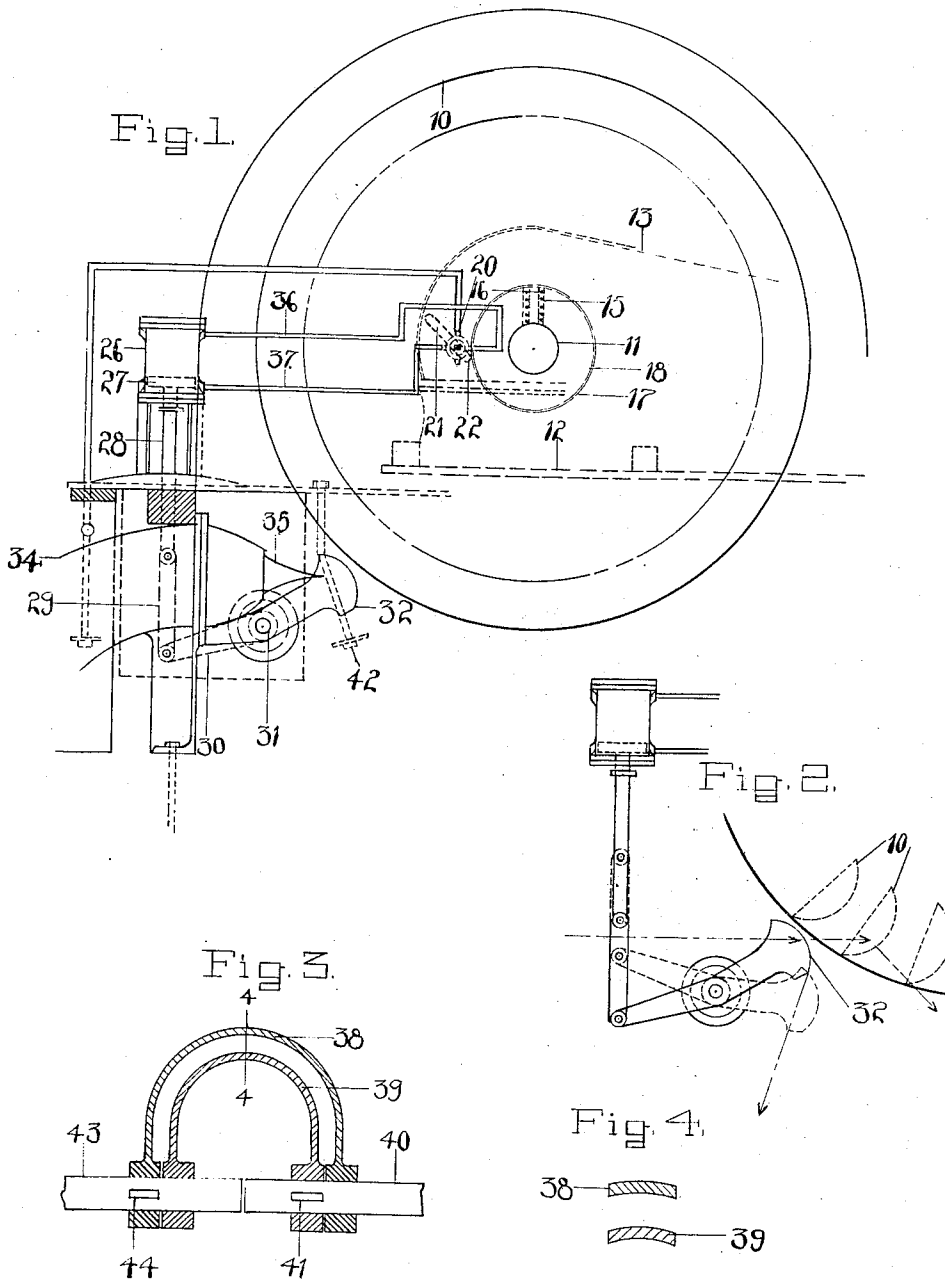


C. A. JACKSON.
 WATER WHEEL SAFETY STOP.
 APPLICATION FILED JAN. 12, 1912.

1,042,681.

Patented Oct. 29, 1912.



Witnesses:
 John Murtagh
 Max. Meusch.

Inventor
 CHARLES A. JACKSON.
 By *Joepel & Joepel*, Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES A. JACKSON, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO THE PELTON WATER WHEEL COMPANY, OF SAN FRANCISCO, CALIFORNIA, A CORPORATION OF CALIFORNIA.

WATER-WHEEL SAFETY-STOP

1,042,681.

Specification of Letters Patent.

Patented Oct. 29, 1912.

Application filed January 12, 1912. Serial No. 670,759.

To all whom it may concern:

Be it known that I, CHARLES A. JACKSON, a citizen of the United States of America, and a resident of New York city, borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Water-Wheel Safety-Stops, of which the following is a specification.

10 This invention relates to water wheel safety stops and has for its object to provide improved means whereby the water wheel may be stopped by the deflection of the water stream, in case any injury should result to the wheel or in case some part should get injured so as to cause the wheel to run at very high speed, or at a speed above normal.

20 For this purpose my invention consists of a deflector movable in the path of the stream for deflecting the stream from the face of the water wheel.

25 In the accompanying drawings, Figure 1 shows a side-view of my improved wheel and water-nozzle and my improved means for deflecting stream from the buckets of the wheel, Fig. 2 is a detail view of the deflector and the means for operating the same, Fig. 3 is a combined form of deflector for use with a speed-governor and safety-stop, and Fig. 4 is a section on line 4—4 of Fig. 3.

30 Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

35 Referring to the drawings, the turbine wheel 10 is provided with a plurality of buckets at its periphery, as is well known, which are not shown in detail in the drawings, and is secured on the shaft 11 suitably supported on a bed-plate 12 to which is also secured the casing 13. The shaft 11 is provided with a centrifugal governor comprising a movable bar 16 which is retained by a helical spring 15 surrounding the bar 16 normally in retracted inner position, in a suitable socket in the governor-wheel 18. Said bar is movable in radial direction, and when the speed of the shaft is above a certain fixed speed, the bar owing to its centrifugal force overcomes the resistance of the spring and projects beyond the periphery 17 of the governor-wheel. A four-way valve 20 is provided which has keyed thereto an arm 21, one end of which 22 ex-

tends in the path of the bar 16 when the latter extends beyond the periphery of the governor-wheel. This valve controls a cylinder 26 and piston 27 to which piston a connecting-rod 28 is connected, which connects with the deflector-arm 30 by means of a link 29. The deflector-arm is pivoted at 31 and is provided with a cup-shaped deflector 32 which is adapted, when in the path of the water stream, to deflect the stream away from the buckets so as to prevent the stream from entering the buckets. The stream of water passes through the tube 34 and out of its nozzle 35 and normally against the buckets held in position by the wheel 10.

The operation of my improved device is as follows: When the speed is above a predetermined one, the bar 16 passes out of the governor-wheel slightly and trips the end 22 of the arm 21, whereby the valve is turned through part of a rotation and left in such position as to cause the liquid to pass through the pipe 36 and operate the piston into lower position shown in dotted lines in Figs. 1 and 2, thereby forcing the deflector in the path of the stream and deflecting its course as shown in Fig. 2. After this operation has been performed the piston 27 and deflector 32 may be returned to their original positions by restoring the arm 21 by hand or otherwise whereby the fluid passes through the pipe 37 which returns the piston 27 to its original or uppermost position thereby moving the deflector 32 into the dotted line position shown in Fig. 2, in which the deflector is shown cup-shaped, and in which the deflector is shown out of the path of the stream.

90 In Figs. 3 and 4 two deflectors are shown with concentric curves, as shown in section in Fig. 4. The stop deflector indicated by 38 extends beyond the governor-deflector 39. The object of the governor-deflector 39 is to be in the path of the stream and divert its course sufficiently so as to vary the force of the impact and thereby vary the speed of rotation of the turbine wheel, whereas the operation of the safety-stop deflector 38 is to divert completely the stream away from the buckets and thereby cause the stopping of the wheel. For this purpose the governor-deflector is secured to the shaft 40 by means of the key 41 and oscillates loosely on the shaft 43 while the safety-stop

deflector 38 is keyed to the shaft 43 by means of the key 44 and oscillates loosely on the shaft 40. The governor-deflector is operated by any suitable governor-mechanism, connected with the shaft 40. This mechanism forming no part of the present invention, is not described. The stop-deflector shaft 43 is operated by the mechanism 27, 28, 29, 30, previously described, the deflector-arm 30 being for this purpose keyed to the shaft 43.

I have shown a certain embodiment of my invention, but it is clear that changes may be made therein without departing from the spirit and scope of the invention as defined in the accompanying claims.

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

1. A water-wheel safety-stop comprising a deflector, means for moving the same to a predetermined point in the path of the stream on arrival of the wheel at a predetermined speed, and means for retaining said deflector at said predetermined point during a subsequent reduced speed of the wheel.

2. A water-wheel safety-stop comprising a deflector, means for moving the same to entire-stream deflecting point on arrival of the wheel at a predetermined speed, and

means for retaining said deflector at said point until the wheel ceases rotation.

3. A water-wheel safety-stop, comprising a deflector, means for moving the same to less than driving point in the path of the stream on arrival of the wheel at a predetermined speed, and means for retaining said deflector at less than driving point until the wheel ceases rotation.

4. A water-wheel safety-stop comprising a deflector, a speed-controlled device carried by the wheel, means controlled by said device for moving the deflector to less than driving point in the path of the stream on arrival of the wheel at a predetermined speed, and means for retaining said deflector at less than driving point until the wheel ceases rotation.

5. The combination of a safety stop deflector, a shaft fixed thereto, a governor-deflector and a shaft fixed thereto, the safety-stop deflector oscillating on the governor-deflector shaft and the governor-deflector oscillating on the safety-stop deflector-shaft.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

CHARLES A. JACKSON.

Witnesses:

JOHN MURTAGH,
MAX. MENSCH.