

P. SAGBERG AND L. MIDDELTHON.
 MEANS FOR PREVENTING RACING IN JET TURBINES.
 APPLICATION FILED DEC. 4, 1917.

1,307,703.

Patented June 24, 1919.

Fig1.

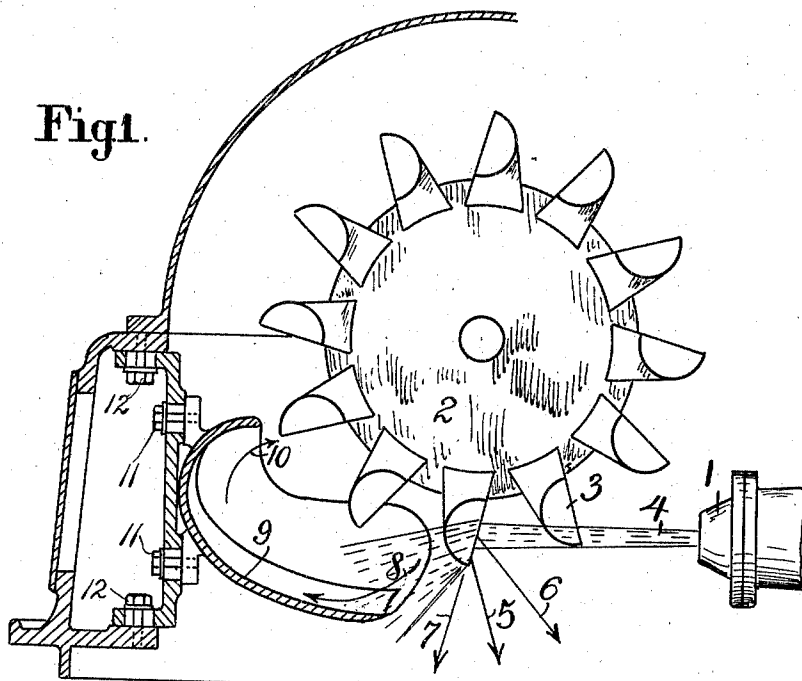
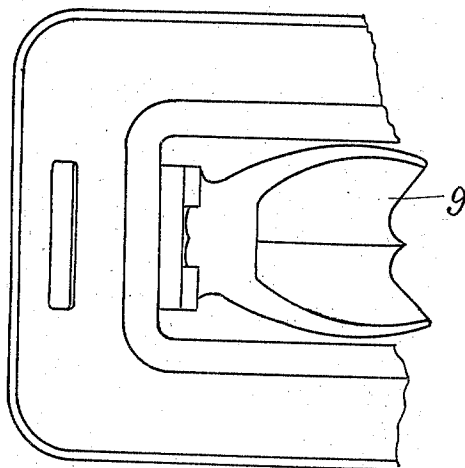


Fig2.



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UNITED STATES PATENT OFFICE.

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MEANS FOR PREVENTING RACING IN JET-TURBINES.

1,307,703.

Specification of Letters Patent. Patented June 24, 1919.

Application filed December 4, 1917. Serial No. 205,409.

To all whom it may concern:

Be it known that we, PAUL SAGBERG and LEIF MIDDELTHON, both subjects of the King of Norway, and residing at Christiania, in the Kingdom of Norway, have invented certain new and useful Improvements in the Means for Preventing Racing in Jet-Turbines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

The present invention relates to turbines of the jet type and has for its object a means for automatically preventing the racing of this kind of turbines.

It is well known that even with the best possible governors such racing may take place if an accident happens and as the racing of a turbine will always expose the parts of the same to a dangerous strain, it is a matter of considerable importance to find a sure and automatic way of preventing such racing.

This according to the present invention is obtained in the following manner.

When the speed of the waterwheel increases, the direction of the water leaving the buckets gradually changes, so that instead of falling straight down it follows more or less the direction of the jet.

This fact is utilized in accordance with the present invention by placing a screen or the like inside the wheel-house in such a manner that the water caught up by said screen is used to counteract the effect of the water directed toward the waterwheel buckets from the mouthpiece.

This may be done either by conducting the water back toward the waterwheel buckets or toward the jet itself deflecting the same wholly or partly.

In the accompanying drawings:

Figure 1 is an elevation partly in section illustrating one form of the invention in connection with a water-wheel of the Pelton type, and

Fig. 2 is a plan view of a screen shown in Fig. 1.

1 is a mouthpiece, 2 is the waterwheel and 3 the buckets of the same.

The jet 4 is directed by the mouthpiece 1 toward the buckets 3.

When the waterwheel runs with its normal number of revolutions the direction of the water leaving the buckets is as indicated by the arrow 5. If the wheel goes slower the water leaves the buckets in the direction indicated by arrow 6 and if it goes faster the water leaving the buckets is directed as indicated by arrow 7 or when still faster as arrow 8.

In the latter case it will be seen that the water is taken up by a stationary bucket or screen 9 by means of which it is directed back as indicated by the arrow 10 against the waterwheel buckets, thus counteracting the effect of the water jet 4.

It will be understood that the illustration is merely diagrammatical and in most cases the screens or buckets 9 will have to be placed on each side of the waterwheel as the water leaving the usual double buckets is partly directed sidewise.

Also it will be understood that the screen or bucket may be given any other form in order to conduct the water toward another point for the same purpose, such as for instance against the jet 4 in order to deflect the same.

Although the method is above described in connection with Pelton waterwheels it is obvious that it may also be utilized in other turbine systems such as steam turbines or the like.

The screen or bucket may be arranged in an adjustable manner so that its position

may be adjusted by hand in a vertical plane by means of bolts 11 and in a horizontal plane by bolts 12, but it may also form a stationary part integral with the turbine house.

Claim:

10 In a water turbine, the combination with a rotary vane member, and a nozzle for projecting a jet of water onto said vanes; of an adjustable deflecting member extending into the path of the jet and adapted to reverse the direction of flow of the latter onto said

vanes after the water has passed the vanes, thereby counteracting the effect of the jet on the vanes.

In testimony that we claim the foregoing as our invention, we have signed our names in presence of two subscribing witnesses.

PAUL SAGBERG.
LEIF MIDDELTHON.

Witnesses:

C. FABRICIUS HANSEN,
C. VARMAN.

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