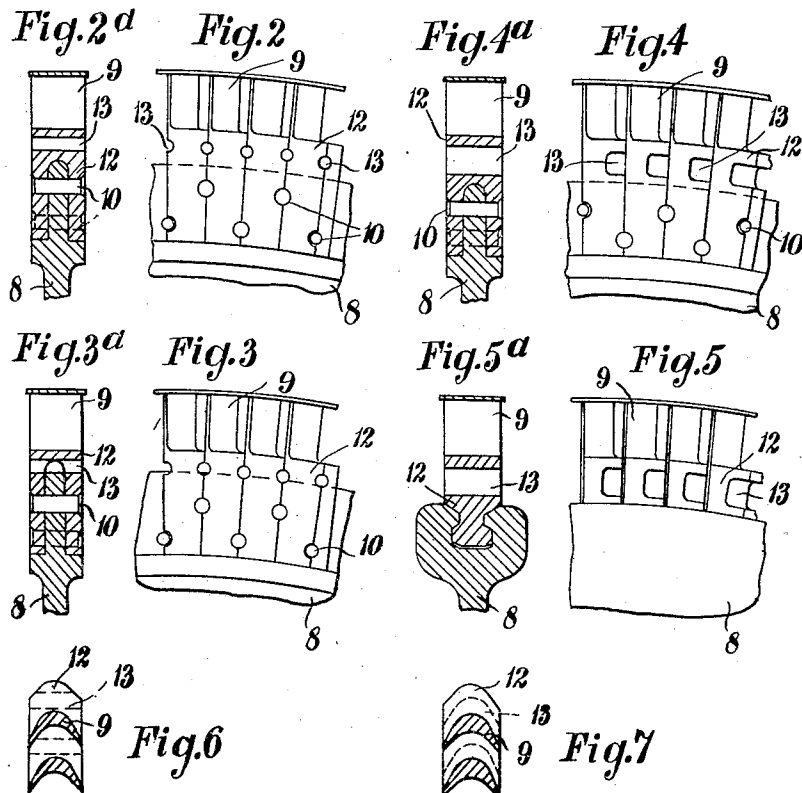
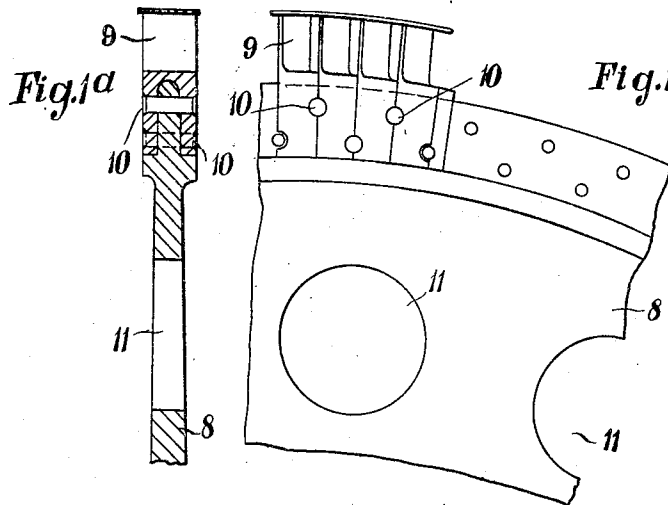


H. L. GUY.
 FLUID PRESSURE TURBINE.
 APPLICATION FILED MAY 13, 1919.

1,360,936.

Patented Nov. 30, 1920.



INVENTOR
 Henry Lewis Guy
 By Jno. S. Green

UNITED STATES PATENT OFFICE.

HENRY LEWIS GUY, OF MANCHESTER, ENGLAND, ASSIGNOR TO THE BRITISH WEST-
INGHOUSE ELECTRIC AND MANUFACTURING COMPANY LIMITED, A COMPANY OF
GREAT BRITAIN.

FLUID-PRESSURE TURBINE.

1,360,936.

Specification of Letters Patent.

Patented Nov. 30, 1920.

Application filed May 13, 1919. Serial No. 296,810.

To all whom it may concern:

Be it known that I, HENRY LEWIS GUY, a subject of the King of Great Britain, and a resident of Victoria Park, Manchester, in the county of Lancaster, England, have invented a new and useful Improvement in Fluid-Pressure Turbines, of which the following is a specification.

This invention relates to steam turbines of the kind in which the moving blades are attached to the periphery of one or more disks or wheels mounted on or formed integral with the turbine shaft. In order to prevent a difference of pressure existing between the two sides of such a disk or wheel while the turbine is in operation a hole or holes (hereinafter termed balance holes) are usually provided in the disk. A disk of this kind is subject to considerable stress and the provision of balance holes therein results in a concentration of stress in the vicinity of said holes which may amount to as much as two or three times the average stress in a disk not provided with balance holes and considerably reduces its factor of safety.

The present invention has for its object to provide an improved construction in which concentration of stress in the disk or wheel arising from balance holes therein is obviated, and according thereto the balance holes are formed in the blading attached to the disk instead of in the disk or wheel itself.

In the accompanying drawings Figure 1 is a fragmentary front view and Fig. 1^a a sectional view of a turbine disk or wheel with blades attached thereto, as at present constructed, with the balance holes in the disk. Fig. 2 is a fragmentary front view of a portion of a turbine disk or wheel with blading attached thereto, and Fig. 2^a a sectional view of the same showing balance holes formed in the blading in accordance with the present invention. Figs. 3, 3^a, 4, 4^a, 5 and 5^a are similar views to Figs. 2 and 2^a respectively, showing modified constructions in accordance with the invention. Fig. 6 is a sectional plan view of the blading shown in Figs. 2 and 3, and Figs. 7 of the blading shown in Figs. 4 and 5.

In Figs. 1 and 1^a the turbine disk or wheel is indicated at 8, the blades 9 being attached to the disk or wheel 8 by rivets 10 in a well known manner. The balance holes 11 are, as shown, formed in the disk itself resulting in undesirable concentration of stresses as before mentioned.

Referring now to Figs. 2 and 2^a, the roots 12 of the blades 9 are increased in length so as to project beyond the periphery of the disk 8, and the balance holes 13 are formed in said projecting roots either by drilling or in any other suitable manner.

The construction shown in Figs. 3 and 3^a is similar to that shown in Figs. 2 and 2^a except that the roots 12 of the blades do not project so far beyond the periphery of the disk 8 the balance holes 13 being located closer to the edge of the disk as shown.

In Figs. 4 and 4^a the balance holes 13 are formed by grooves cut around the rear face of the blade roots 12. The formation of the balance holes 13 is similar in Figs. 5 and 5^a, the only difference in this construction being the method of attaching the blades 9 to the disk or wheel. Where separate packing pieces are employed between the blades the balance holes may be formed in the packing pieces which are extended so as to project beyond the periphery of the disk.

It is to be understood that the invention is not limited to any particular manner of forming the balance holes in the blading, the constructions hereinabove described being given by way of example only.

I claim as my invention:—

1. A steam turbine disk or wheel having balance holes formed in the blading attached to the periphery thereof with the object specified.

2. A steam turbine disk structure including a web portion with a blade fastening portion and blading having fastening means coöperative with said fastening portion, said structure having balance holes therein outside of the web portion.

In testimony whereof I have hereunto subscribed my name this 10th day of March, 1919.

HENRY LEWIS GUY.