No. 888,500. PATENTED MAY 26, 1908.

J. HISSINK.

TURBINE.

APPLICATION FILED OCT. 23, 1907.

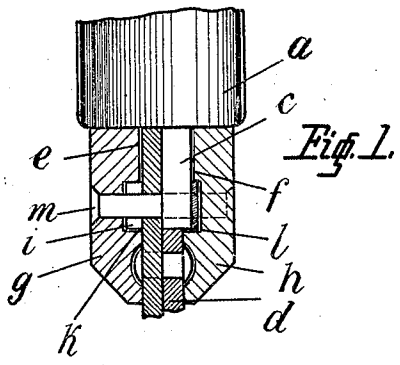


Fig. 1.

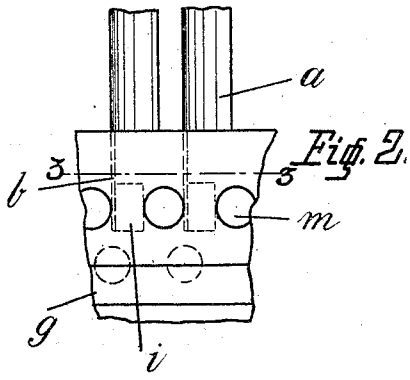


Fig. 2.

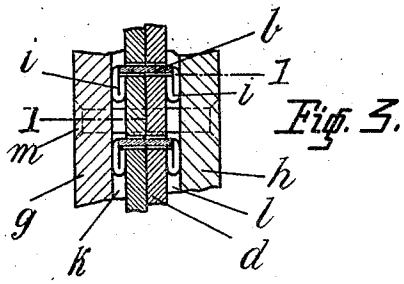


Fig. 3.

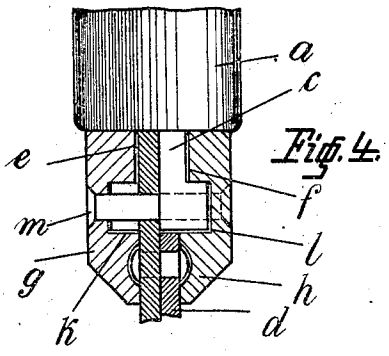


Fig. 4.

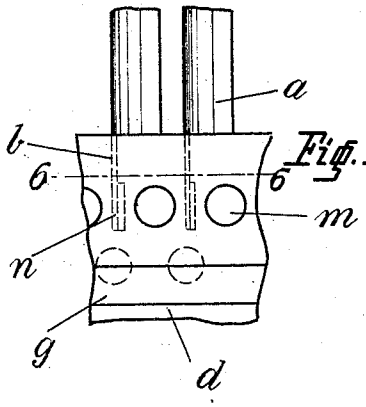


Fig. 5.

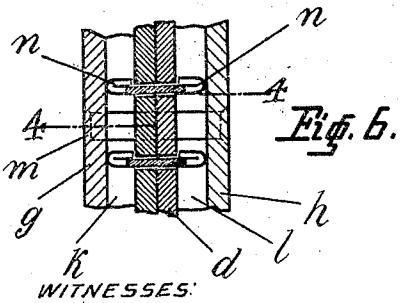


Fig. 6.

WITNESSES:

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UNITED STATES PATENT OFFICE.

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TURBINE.

No. 888,500. Specification of Letters Patent. Patented May 26, 1908.

Application filed October 23, 1907. Serial No. 398,714.

To all whom it may concern:

Be it known that I, JACK HISSINK, a subject of the Queen of the Netherlands, and resident of the city of Berlin, Germany, have invented certain new and useful Improvements in Turbines, of which the following is a specification.

My invention relates to turbines, and particularly steam turbines, and has for its object to provide an improved fastening of the turbine blades to the wheel or disk.

I have devised a construction in which the blades instead of being riveted to the periphery of the wheel, are secured by means of special holding rims.

Two forms of my invention are illustrated in the accompanying drawings.

Figure 1 is a cross section taken axially through a portion of the turbine, on line 1—1 of Fig. 3; Fig. 2 is a corresponding side view and Fig. 3 a section on line 3—3 of Fig. 2; Fig. 4 is a section on line 4—4 of Fig. 6; Fig. 5 is a side view and Fig. 6 a section on line 6—6 of Fig. 5, these three views corresponding to Figs. 1, 2 and 3, and showing the second form of my invention.

The blades *a* are provided with extensions or feet *b* arranged in slits *c* of the wheel or disk *d*. The outer portion of each foot *b* is made of a width somewhat exceeding the thickness of the disk *d*, and the parts of the foot which project beyond the surfaces of the disk are received in slits *e* and *f* of the holding rims *g* and *h* respectively.

In the construction illustrated by Figs. 1, 2 and 3, the inner part of each foot *b* has lugs *i* bent at right angles to the main portion of the foot, and preferably these lugs are made of a double thickness by folding the material as shown in Fig. 3. The inner foot portion is thus substantially U-shaped, and the lugs *i* are received in annular grooves *k*, *l* of the holding rims *g*, *h*. By means of rivets *m* the holding rims are secured in such a manner that the blade feet *b* cannot leave the annular grooves *k*, *l*, and the slits *e*, *f*.

The construction shown in Figs. 4, 5, and 6, differs from that first described only by the shape of the inner foot portions. Instead of having lugs *i* bent at right angles, the feet are provided with lateral or axially extending lugs *n* received in the grooves *k*, *l* and preferably doubled to increase their strength. The additional strength given to the lugs *i* or *n* is desirable in order that they may better withstand the strains due to centrifugal action.

I claim as my invention:

1. In a turbine, the combination, with the disk having slits at its outer portion, of blades provided with feet extending into said slits, the inner portions of said feet projecting beyond the disk, and holding rims secured to the disk on each side thereof and provided with annular grooves to receive the projecting portions of said feet.

2. In a turbine, the combination, with the rotary disk provided with slits, of holding rims secured to the disk and provided with annular grooves, and blades having feet projecting into said slits and grooves.

3. In a turbine, the combination, with the rotary disk having slits and the blades provided with feet set in said slits and projecting from the disk, of holding rims secured to the disk and recessed to receive the projecting portions of the blade feet.

4. In a turbine, the combination, with the rotary disk having slits and the blades provided with feet set in said slits and projecting from the disk, of a holding member secured to the disk and recessed to receive the projecting portions of the blade feet.

5. In a turbine, the combination, with the rotary disk and the blades provided with feet the inner portions of which have lugs disposed at right angles to form U-shaped ends, of holding members secured to the disk and recessed to receive said lugs.

6. In a turbine, the combination, with the rotary disk having slits and the blades provided with feet set in said slits the inner portions of said feet having lugs disposed axially and projecting from the disk, of holding members secured to the disk and recessed to receive said lugs.

7. In a turbine, the combination, with the rotary disk and the blades provided with feet the inner portions of which have lugs bent upon themselves to increase the thickness of the material, of holding members recessed to receive said lugs.

8. In a turbine, the combination, with the disk having slits at its outer portion, of blades provided with feet extending into said slits and also projecting therefrom, and holding members recessed to receive the projecting foot portions.

9. In a turbine, the combination, with the disk having slits at its outer portion, of

blades provided with feet the outer portions of which have a width greater than the thickness of the disk, and the inner portions of which are provided with lugs, and holding members secured to said disk and provided with slits to receive the projecting outer portions of the feet, and with annular grooves to receive said lugs.

10. In a turbine, the combination with the rotary disk and the blades provided with feet extending inwardly beyond the periphery of the disk and also having lugs disposed axially and projecting from the disk laterally, of holding members secured to the disk and recessed to receive said lugs.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses this first day of October, 1907.

JACK HISSINK.

Witnesses:
WOLDEMAR HAUPT,
HENRY HASPER.