J. DIANOVSZKY.

BLADES FOR TURBINES.

APPLICATION FILED JULY 12, 1913.

1,094,133. Patented Apr. 21, 1914.

Fig: 1

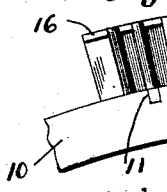


Fig: 2.

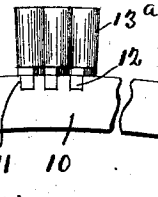


Fig: 3,

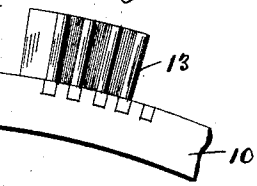


Fig: 4

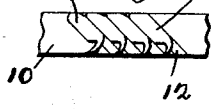


Fig: 5

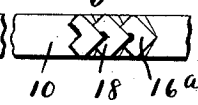


Fig: 6,

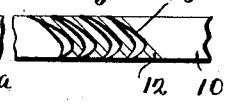


Fig: 7,

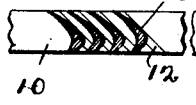


Fig: 8,

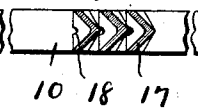


Fig: 9,

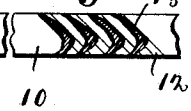


Fig: 10,

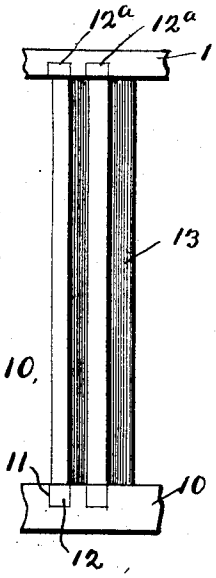
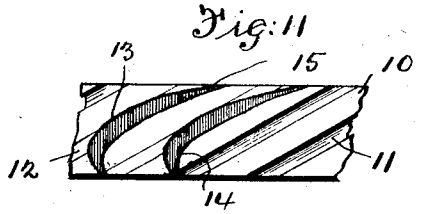


Fig: 11



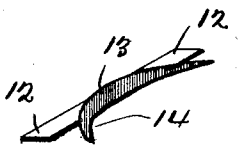


Fig: 12,

Witnesses:
A. D. Sawmill
M. G. O'Donnell

John Dianovszky, Inventor,
By his Attorney
W. P. Hutchinson.

UNITED STATES PATENT OFFICE.

JOHN DIANOVSZKY, OF PASSAIC, NEW JERSEY, ASSIGNOR OF ONE-HALF TO OSWALD A. SCHLEGEL, OF PASSAIC, NEW JERSEY.

BLADES FOR TURBINES.

1,094,133. Specification of Letters Patent. Patented Apr. 21, 1914.

Application filed July 12, 1913. Serial No. 778,627.

To all whom it may concern:

Be it known that I, JOHN DIANOVSZKY, a citizen of the United States, residing at Passaic, Passaic county, New Jersey, have invented a new and useful Improvement in Blades for Turbines, of which the following is a full, clear, and exact description.

My invention relates to improvements in the blade construction of steam, gas, or other elastic fluid turbines, and the object of my invention is to construct the blades and their supports so that the blades can be very easily made, can be readily inserted in the running rings of the turbine, will be shaped so that they will get the full force of the pressure fluid or the impact of the fluid which propels the turbine, and particularly to construct the blades with bases which can be readily inserted in grooves in the running rings, and in which a part of a blade will overlap the base of the next adjacent blade, thus binding the whole series of blades in place. This arrangement holds them against accidental displacement, and yet permits any one or more of them to be easily inserted or removed whenever necessity requires. I have used these blades and fastenings of the same in a steam turbine, but they are just as well adapted to gas turbines or to other forms of machines where blades are used.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a broken side elevation of a running ring provided with my improved blades. Fig. 2 is a side elevation of a slightly modified form of the construction. Fig. 3 shows another slight modification in which the top flanges are omitted. Figs. 4, 5 and 6 represent plans of the construction shown in Figs. 1, 2 and 3 respectively. Figs. 7, 8 and 9 represent horizontal sections through the blades shown in Figs. 4, 5 and 6. Fig. 10 is a broken side elevation very much enlarged, of another slight modification of the invention. Fig. 11 shows a sectional plan of another modification of the blade, and Fig. 12 is a detail of one of the blades.

The blades are adapted to be used in connection with running rings 10, which can be of any approved or usual kind, and these are provided with parallel grooves 11 which extend diagonally across the face of the rings. These grooves are adapted to receive the bases 12 of the blades 13, and the bases are always straight bases which will just fill the grooves 11 and lie flush with the top of the ring 10, while the body of the blade itself may be changed somewhat, as presently described. The grooves are plane grooves which are rectangular in cross section, and the bases 12 of the blades are of the same shape as the grooves which they fill, so that the blade bases can be either driven in lengthwise of the grooves, or driven in straight on the radial line of the ring. This makes the blade and ring very simple to construct, and enables a blade to be easily inserted or removed. The blade 13 is preferably formed with a sharp bend 14 at its forward or intake edge, and with a wide tail-piece 15 extending rearwardly as shown in Fig. 12. This causes the elastic fluid to strike against the blade in a manner to exert a forward propelling force, and the tail-piece 15 guides it to the next series of blades in the usual manner; but as it extends well rearward, it enables all the expansive force of the fluid to be used as well as the impact force. A particular advantage of the construction referred to and shown in detail in Figs. 7, 9 and 12, is that each blade 13 has the part 14 shaped to overlap the base 12 of the next adjacent blade, thus fastening said blade in place. It will be observed that this arrangement of the blade and base causes pressure on the blade (see Fig. 7) as exerted on a plane parallel with the movement of the ring 10, to be almost longitudinal of the base, or at least at less than a right angle to the base, so that the blade is very much stronger. Where the strain is transverse of the base, the blade is very likely to be broken off.

The blades can be left open at the top, especially if they are short, as in Figs. 3 and 6, or they can be closed by flanges as for instance the flanges 16 in Fig. 1. These flanges serve to confine the elastic fluid between the blades, and they further serve to act as braces, because the flange of one blade abuts with the flange of the next. The particular form of blade, however, can be departed from without affecting the principle of the invention. For instance the body of the blade can be made triangular as shown at

17 in Fig. 8, and this can be provided with flange 16ª at the top, of the same general shape as the blade, and as shown in Fig. 5. The flanges can also be arranged at the bottom, and the flanges at top and bottom can be notched in the center as shown at 18, so that the apex of one blade will fit into the notch of the next, and the bodies of the blades will overlap the bases of the next adjacent blade as already described.

For large machines and where long blades are used, instead of the flanges at the outer ends of the blades, they can be inserted in a connecting ring as shown at 19 in Fig. 10. In such case the ring 19 has grooves to receive the tops 12ª of the blades, which tops are made precisely like the bases 12 already referred to, and slip into the ring in the same manner.

In Fig. 11 I have shown a form of blade substantially as already described, except that the part 14 does not overlap the base of the next blade. This I find an efficient form of blade, but I prefer the form in which the blades lock.

From the foregoing description it will be seen that the blade which I produce is exceptionally strong, that the means of locking it in the running ring is particularly easy, that each blade locks the next thus forming a chain of locked blades, and that the blades are constructed so as to get the full force of the elastic fluid used to drive the engine.

I have shown my improved blade and the fastening means as applied to a running ring, but it will of course be understood that the blades can be fastened in the same manner in a stationary ring.

I claim:—

1. The combination with a ring having plane parallel grooves across its face, of a series of blades each blade having a base to fit one of the aforesaid grooves, and a wing or body portion rising from the base one edge portion of the wing being sharply inturned so as to project beyond the base and overlap the base of a next adjoining blade, and the second edge of the wing projecting from the base at a less angle than the first edge, the two edges of the wing lying within the vertical planes of the ring sides.

2. The combination with the ring having diagonal grooves across its face, of a series of blades having bases to fit the grooves, and curved bodies rising from the bases, the said bodies being so shaped that a portion of the body of one blade shall overlap the base of the next adjacent blade.

JOHN DIANOVSZKY.

Witnesses:
GEORGE FESKA,
JOHN SHAFRAN.