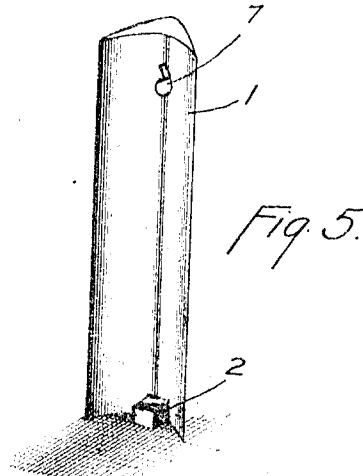
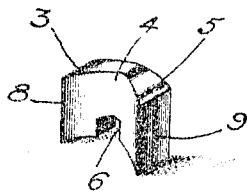
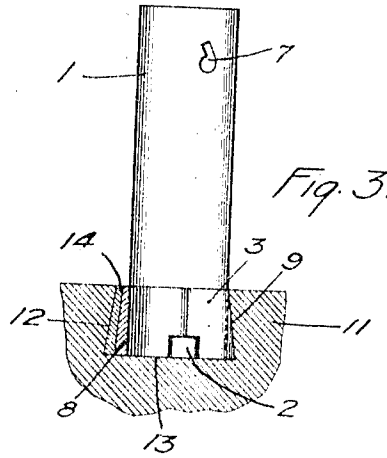
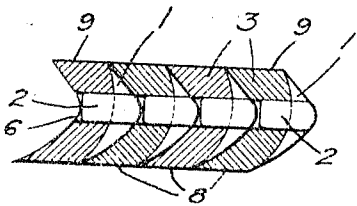
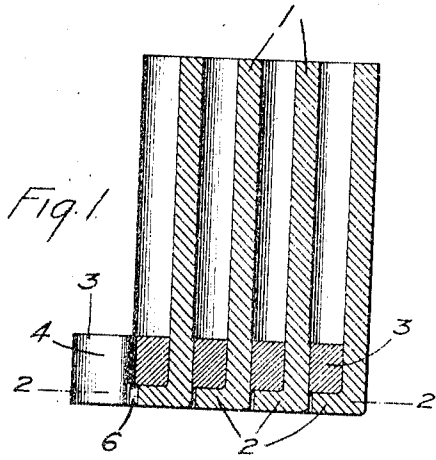


1,061,640.

Patented May 13, 1913.



WITNESSES:

John E. Snyder

B. J. Mark

INVENTOR.

BY

John E. Snyder
John D. Green

HIS ATTORNEY IN FACT.

UNITED STATES PATENT OFFICE.

JOHN E. SNYDER, OF SWISSVALE, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE COLONIAL TRUST COMPANY, TRUSTEE, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

BLADING.

1,061,640.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed October 10, 1910. Serial No. 586,286.

To all whom it may concern:

Be it known that I, JOHN E. SNYDER, a citizen of the United States, and a resident of Swissvale, in the county of Allegheny and State of Pennsylvania, have made a new and useful invention in Blading, of which the following is a specification.

This invention relates to turbines and particularly to the blading thereof.

As is well known to those skilled in the art, the usual method of fastening turbine blades to the blade carrying element is to arrange blades and packing pieces in alternate order and secure these in grooves in the blade carrying element, either by peening or caulking. In practice there is a tendency for the blades to work loose with attendant disadvantages.

One object of my invention is to provide means whereby the blades and packing pieces will be so correlated that the liability of the blades to become loose in service will be eliminated.

Another object of the invention is to provide means whereby each blade may be securely fastened against centrifugal displacement to an adjacent packing piece.

Other objects and advantages of this invention will be understood from the following description when read in connection with the drawings, it being apparent that changes in form, proportion and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages.

In the drawings: Figure 1 is a sectional view through a plurality of packing pieces and blades; Fig. 2 is a sectional view on the line 2--2 of Fig. 1; Fig. 3 is an end view of a row of blades in a blade holding element; Fig. 4 is a detail perspective view of one of the packing pieces; and Fig. 5 is a detail perspective view of one of the blades.

Referring now to the drawings by numerals of reference, 1 designates a blade here shown as being of the Parsons type,

and provided at one end with a laterally projecting stud, which may be formed on the end of the blade 1 and turned over at approximately right angles to the plane of the face of the blade.

3 designates a packing piece comprising a segment, having a face 4 to conform to the convex side of the blade 1 and a face 5 to conform to the concave side of the blade 1. The packing piece 3 is shown as having an undercut slot 6 in the lower edge to receive the stud or projection 2 of the blade 1. The blades 1 may be provided with comma-shaped openings 7, if desired, to receive a wire of corresponding form, whereby the well known comma-lashing may be provided.

In the present form, I have shown the packing pieces as having a straight side 8 and an incline side 9. The incline side 9 of the packing piece is adapted to fit the undercut portion of the groove in the blade carrying element 11. The straight side of the packing pieces will be adjacent to wedges 14 which engage the undercut side 12 of the groove 13 in the blade carrying element 11, and the packing pieces and blades may be securely fastened in the groove 13 by wedges 14; the fastening of the blades and packing pieces in the grooves being accomplished in any well known manner.

By the construction just described, the blades and packing pieces will be firmly fastened in the blade carrying element and any liability of their becoming loose will be reduced to a minimum, if not wholly avoided.

Having thus described my invention what I claim is:

1. The combination with a packing piece having an undercut portion and a blade having a projection completely filling the undercut portion.

2. The combination with a packing piece having an undercut portion extending entirely through it, and a blade having a projection of the same cross sectional area as the undercut portion.

3. The combination with a packing piece having an undercut portion extending entirely through it, and a blade having a projection extending into the undercut portion, the bottom edges of the packing piece and the projection being in the same plane.

In testimony whereof, I have hereunto

subscribed my name this 6th day of October, 1910.

JOHN E. SNYDER.

Witnesses:

C. W. MCGHEE,
J. A. GRISWOLD.