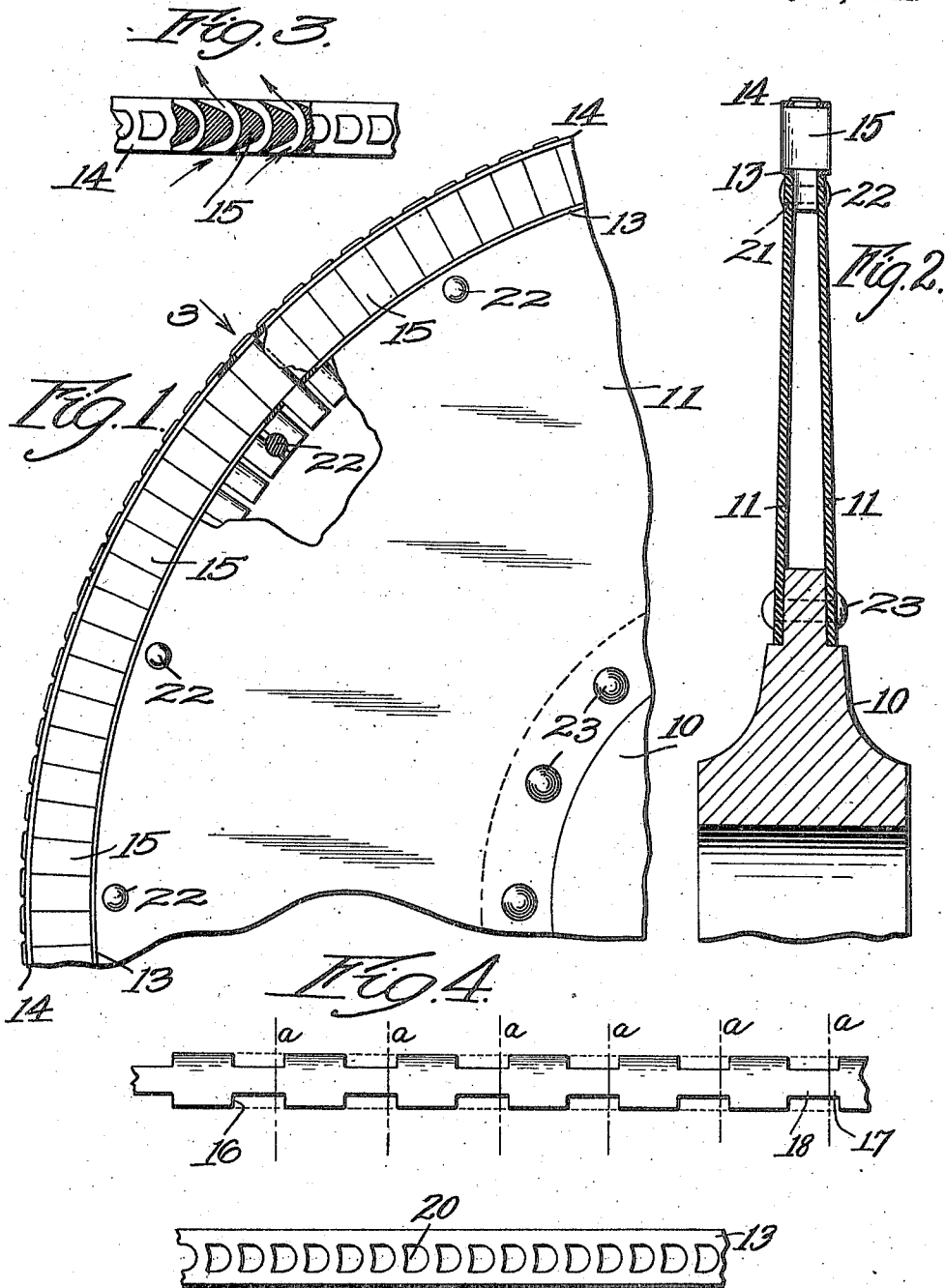


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 ROTOR.

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1,417,029.

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ROTOR.

1,417,029.

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To all whom it may concern:

Be it known that I, AXEL W. CARLSON, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Rotor, of which the following is a specification.

This invention relates to a rotor for a steam turbine or other similar machine.

The bronze vanes in such rotors are subject to excessive wear and it is desirable to use hard drawn bar stock for these parts. It is the object of my invention to provide a rotor construction in which the vanes are separately formed of bar stock, and in which they are securely held against accidental displacement when in use.

To this end I preferably provide each vane with non-circular projections at each end by which it may be secured in perforated concentric bands provided for the purpose. This construction holds the vanes in the desired spaced relation and effectively prevents relative angular displacement.

Another object of my invention is to provide a firm and satisfactory support for the vanes and bands, together with suitable means for securing the parts together.

My invention further relates to certain arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claim.

A preferred form of my invention is shown in the drawings in which—

Fig. 1 is a partial side elevation of my improved rotor;

Fig. 2 is a partial vertical sectional view thereof;

Fig. 3 is a detailed plan view, partly in section, looking in the direction of the arrow 3 in Fig. 1;

Fig. 4 shows the method of forming the vanes from bar stock, and

Fig. 5 is a detail view of a portion of one of the bands.

Referring to the drawings, my improved rotor in its preferred form comprises a hub 10, side plates or discs 11, inner and outer concentric bands 13 and 14, and a plurality of separate vanes 15. The vanes 15 are preferably formed from bar stock drawn

to the exact shape of the vane, such as is shown in Fig. 3. This stock may be fed through a press or other machine by which successive notches 16, (Fig. 4) are formed on the opposite edges of the stock. After these notches are formed, the stock is severed along the dotted lines *a* to form a plurality of separate vanes, each having a short upper projection 17 and a longer lower projection 18.

The bands 13 and 14 are provided with a succession of openings of perforations 20 (Fig. 5) of irregular outline corresponding to the cross section of the projections 17 and 18. The vanes are then assembled between the bands 13 and 14 and the short upper projections 17 are headed down or riveted on the band 14.

These assembled parts may then be mounted upon the hub 10 and discs 11 with the projections 18 between the discs 11.

A plurality of holes 21 are formed in the discs 11, so disposed that they each lie between two adjacent vanes. After the parts are assembled, a drill is inserted in each hole 21 and is advanced between the corresponding vanes, thus forming notches in their adjacent faces through which a rivet 22 may be inserted. Additional rivets 23 secure the discs firmly to the hub 10. When the rivets 22 and 23 are securely headed, a very rigid structure results in which accidental displacements of the vanes is practically impossible. Furthermore, the non-circular section of the projections 17 and 18 prevents angular displacement of the vanes.

Having thus described my invention it will be evident that my improved construction enables me to utilize hard drawn stock for the vanes and also to mount these vanes in a simple, economical and effective manner. It will be evident to those skilled in the art that changes and modifications can be made in my invention within the scope of my invention as set forth in the claim, and I do not wish to be otherwise limited to the details herein disclosed, but what I do claim is:—

A rotor having in combination a hub, a pair of discs mounted thereon, inner and outer concentric bands, a plurality of vanes having their outer ends secured to the outer band and their reduced inner ends formed of

uniform cross section throughout their length and projecting through the inner band and between said discs, and fastening devices extending through said discs 5 and between certain of said projecting portions, each fastening device being disposed in notches in the adjacent faces of two adjacent projecting portions and preventing withdrawal thereof and also firmly holding said discs against the outer 10 faces of the inner ends of said vanes.

In testimony whereof I have hereunto affixed my signature.

AXEL W. CARLSON.