No. 738,574. PATENTED SEPT. 8, 1903.

H. RICHTER.

STEAM TURBINE.

APPLICATION FILED APR. 28, 1903.

NO MODEL.

Fig. I.

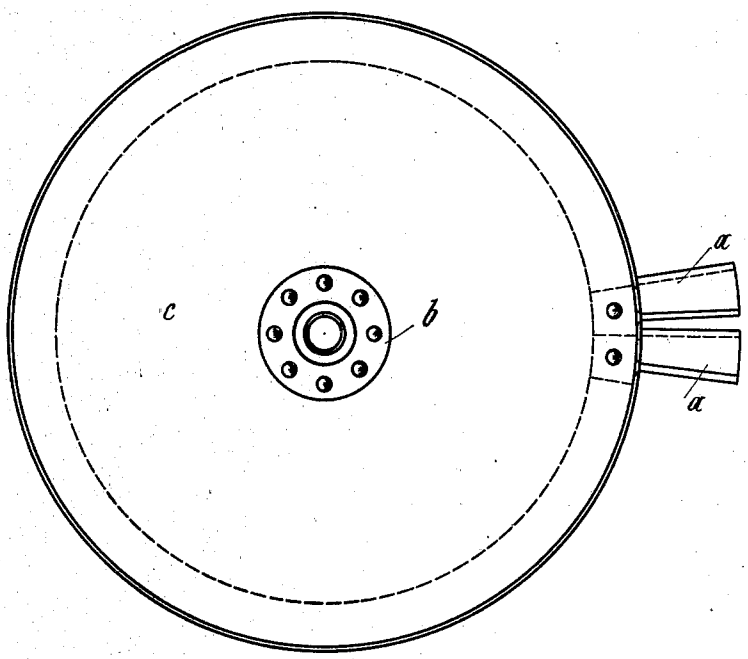
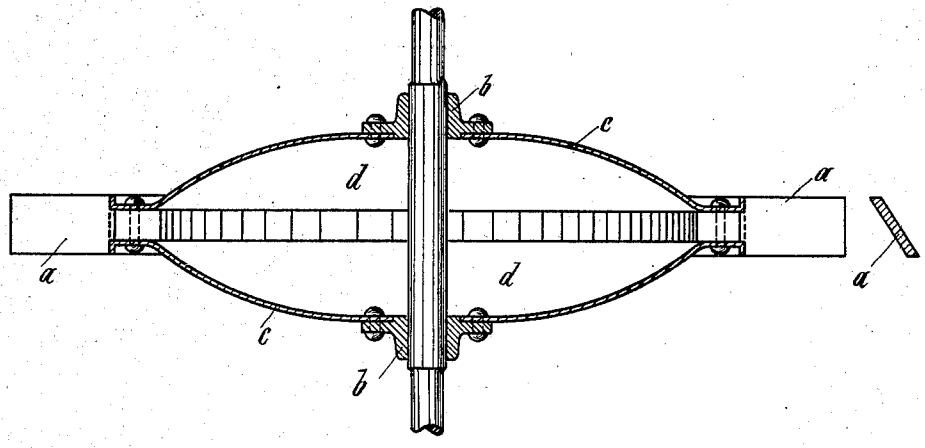


Fig. II.



Attest:
C. Middleton
Edward Sartow

Inventor:
Hans Richter
by Richards & Co.
Attys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 738,574. Patented September 8, 1903.

UNITED STATES PATENT OFFICE.

HANS RICHTER, OF NUREMBERG, GERMANY, ASSIGNOR TO FIRM OF VEREINIGTE MASCHINENFABRIK AUGSBURG UND MASCHINENBAU-GESELLSCHAFT NÜRNBERG A. G., OF NUREMBERG, GERMANY.

STEAM-TURBINE.

SPECIFICATION forming part of Letters Patent No. 738,574, dated September 8, 1903.

Application filed April 28, 1903. Serial No. 154,712. (No model.)

To all whom it may concern:

Be it known that I, HANS RICHTER, engineer, a subject of the Emperor of Germany, residing in Nuremberg, in the Empire of Germany, (whose full postal address is 15 Gleisbühlstrasse, Nuremberg, aforesaid,) have invented certain new and useful Improvements in and Connected with Steam-Turbines, of which the following is a specification.

In steam-turbines, and more particularly in those in which the steam enters axially, in order to obtain uniform quiet running and to avoid the deleterious and dangerous effects of a one-sided distribution of the mass the walls are made in such a way that the paddle-wheel or vane-wheel, formed by placing together similar separate vanes of uniform weight, is secured or fitted between disk-shaped pressure-plates, and while it is also firmly connected with the axis of rotation it is so constructed as to form an exactly-balanced whole. Apart from the circumstance that this method of construction does not afford a perfectly secure and reliable connection of the wheel-rim vanes with one another and of the whole ring of vanes with the wheel-axle, it also involves unnecessary accumulation of metal, and owing to the distribution of the weights not being uniform it involves a one-sided action of the centrifugal forces, which causes considerable resistance to the movement and causes disturbing noises to be set up.

Now the present invention has for its object to construct a vane-wheel in such a way that the above-mentioned drawbacks are as far as possible avoided. This is attained, in the first place, by the connecting parts on the heavy side being replaced by considerably lighter ones. For this object the paddle-wheel shown in the accompanying drawings, in which Figure 1 is an end view, and Fig. 2 a plan view, and which is formed, as usual, of separate vanes or blades *a*, Fig. 1, is connected on both sides of a central plane, Fig. 2, with a central hub mounted on the turbine-shaft, which hub is composed of dished concave sheet-metal disks *c*, on which the vanes or blades *a*, which are arranged close together, are separately attached by rivets, screws, or the like in such a way that any tangential turning of the same is impossible, while a steam-tight joint is formed relative to the chamber *d*, inclosed by the dish-shaped part *c*. The form of the sheet-metal dished parts *c* also necessitates the formation of an adjustable enlargement of the whole construction toward the wheel-axle, the stability of which is thereby considerably increased, so that the vibrations arising from the very rapid rotations are reduced to a minimum. The use of the sheet-metal dished parts as a means of connection between the blade-rim and the hub also has the advantage that any existing unequal distribution of the weights relative to the axis of rotation may be compensated for by small recesses or perforations at suitable places in the sheet-metal wall.

I declare that what I claim is—

In combination in a wheel for steam-turbines, the shaft, the hubs mounted thereon, concave sheet-metal disks secured to the hubs and a ring of vanes secured to the peripheries of the disks, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HANS RICHTER.

Witnesses:

MARTIN OFFENBACHER,

OSCAR BOCK.