L. C. LOEWENSTEIN.

TURBINE ROTOR.

APPLICATION FILED JUNE 22, 1914.

1,109,998. Patented Sept. 8, 1914.

Fig. 1.

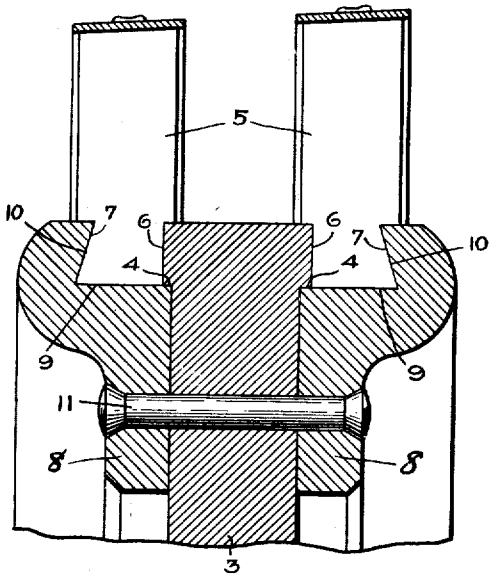
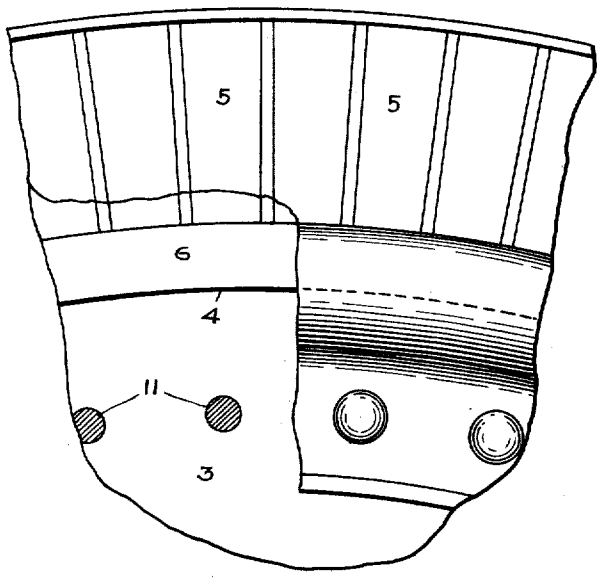


Fig. 2.



Witnesses:
Marcus L. Byng.
J. Ellis Glen.

Inventor;
Louis C. Loewenstein,
by Albert G. Davis
Att'y.

UNITED STATES PATENT OFFICE.

LOUIS C. LOEWENSTEIN, OF LYNN, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

TURBINE-ROTOR.

1,109,998. Specification of Letters Patent. Patented Sept. 8, 1914.

Application filed June 22, 1914. Serial No. 846,412.

To all whom it may concern:

Be it known that I, LOUIS C. LOEWENSTEIN, a citizen of the United States, residing at Lynn, in the county of Essex, State of Massachusetts, have invented certain new and useful Improvements in Turbine-Rotors, of which the following is a specification.

The present invention relates to rotors for elastic fluid turbines.

The primary object of the invention is to provide a rotor carrying two rings of buckets which will require a minimum amount of machine work, which has few parts to be accurately fitted to each other, and which will be economical of material and easy to assemble, whereby a simple and cheap structure will result.

For a consideration of what I believe to be novel and my invention attention is directed to the accompanying description and the claims appended thereto.

Referring to the drawing, Figure 1 is a sectional view of a portion of a turbine rotor, and Fig. 2 is a side view.

In carrying out my invention I provide a web member 3 formed of a flat plate and turned down to form the shoulders 4. This plate 3 need be turned down and finished only adjacent the periphery if desired, the remainder being left in the rough. This work can all be done in a lathe.

5 indicates the buckets, the bases of which are formed with one straight, or substantially straight face 6 and one beveled face 7. The straight faces fit against the sides of the web and are held in place by the clamping members 8. Between the bucket bases are spacing devices of any suitable character. Each clamping member comprises an annular ring which may be made preferably in one section but can also be made in a number of sections as desired, having a circumferential rabbet or groove, the bottom 9 of which projects under the shoulder 4 and forms a support for the bottoms of the bucket bases, and the side 10 of which is beveled or undercut to coöperate with the beveled faces of the bucket bases. The clamping members are fastened to the web by means of suitable bolts or rivets 11. The shoulders 4 serve to carry the centrifugal load of the members 8, so that the rivets 11 carry no part of this load.

By the above arrangement it will be seen that but three major parts; *i. e.*, the web and the two clamping members, are required to form a two bucket combination and that there are but few surfaces to be fitted to each other and few limiting dimensions, the only tight fit or limiting dimensions being the tightness of the surfaces 6 and 7. Should this fit be too loose a slight machine cut on plate 3 or part 8 remedies this. Ordinarily such correction is impossible. The amount of machine work necessary is materially decreased when compared with that ordinarily required, and all the machine work is of a simple character and no grooves need be machined, all machine work being performed by tools or cutters removing metal from the outside of any part. The assembling of the wheel is also a very simple matter, as will be obvious.

Also by making the bucket bases with one straight face as shown I effect a saving of material as the buckets can be formed from thinner plates than would be the case were both faces beveled.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof; but I desire to have it understood that the apparatus shown is only illustrative, and that the invention can be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In a turbine, a bucket wheel comprising a web member having shoulders formed on opposite sides adjacent its periphery, clamping members each having an undercut rabbet which engages the shoulders, and buckets having their bases clamped between the web and the members, said buckets having beveled faces which coöperate with the undercut rabbet.

2. In a turbine, a bucket wheel comprising a web member having shoulders formed on opposite sides adjacent its periphery, clamping members each having an undercut rabbet, which engages the shoulders and forms a groove with the outer faces of the web having one straight side and one undercut side, said buckets having their bases formed to fit said groove.

3. In a turbine, a bucket wheel comprising

a web member having shoulders formed on opposite sides adjacent its periphery, buckets having their bases formed with one straight side and one beveled side with the straight side taking against the side of the web, clamping members each having an undercut rabbet which fit against the sides of the web under the shoulders with the undercut rabbets forming a seat for the bottom and beveled sides of the bucket bases, and means for fastening the members to the web.

In witness whereof, I have hereunto set my hand this 18th day of June, 1914.

LOUIS C. LOEWENSTEIN.

Witnesses:
HARRY F. BENSON,
WILLIAM J. MCBRIDE.

a web member having shoulders formed on opposite sides adjacent its periphery, buckets having their bases formed with one straight side and one beveled side with the straight side taking against the side of the web, clamping members each having an undercut rabbet which fit against the sides of the web under the shoulders with the undercut rabbets forming a seat for the bottom and beveled sides of the bucket bases, and means for fastening the members to the web.

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WILLIAM J. MCBRIDE.

Correction in Letters Patent No. 1,109,998.

It is hereby certified that in Letters Patent No. 1,109,998, granted September 8, 1914, upon the application of Louis C. Loewenstein, of Lynn, Massachusetts, for an improvement in "Turbine-Rotors," an error appears in the printed specification requiring correction as follows: Page 1, line 106, for the word "said" read *and;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of April, A. D., 1915.

[SEAL.]

J. T. NEWTON,
Acting Commissioner of Patents.

Correction in Letters Patent No. 1,109,998.

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[SEAL.]

J. T. NEWTON,

Acting Commissioner of Patents.