J. L. MOORE.

TURBINE BUCKET.

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1,304,793.

Patented May 27, 1919.

Fig. 1

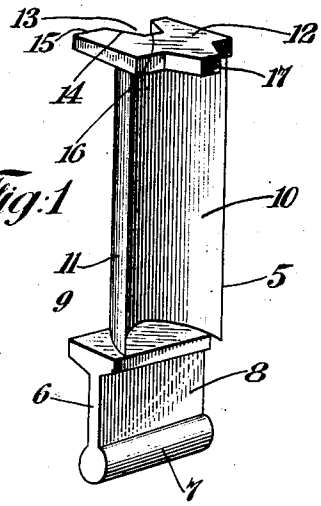


Fig. 2

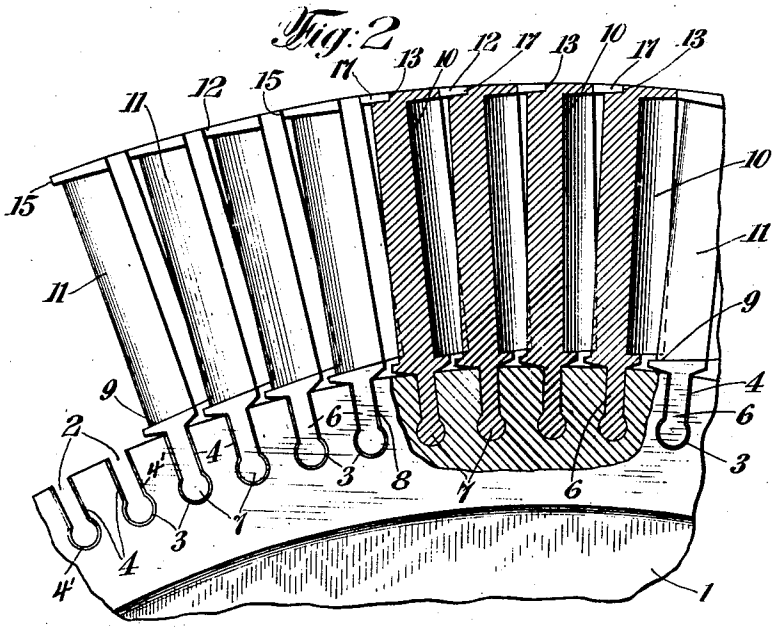


Fig. 4

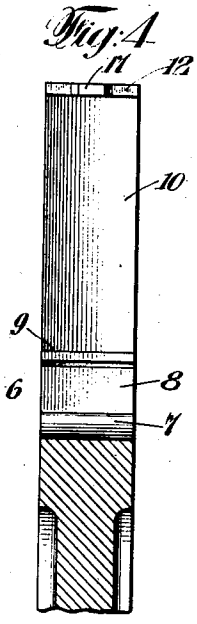
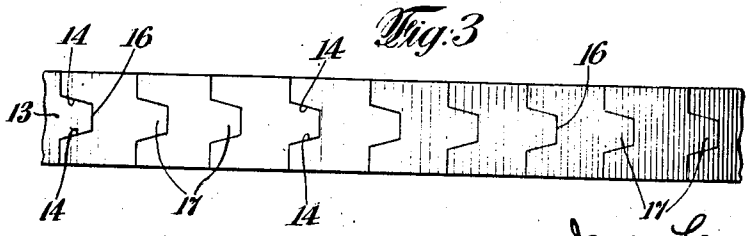


Fig. 3



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UNITED STATES PATENT OFFICE.

JAMES LEONARD MOORE, OF WELLSVILLE, NEW YORK, ASSIGNOR TO THE KERR TURBINE COMPANY, OF WELLSVILLE, NEW YORK, A CORPORATION OF NEW YORK.

TURBINE-BUCKET.

1,304,793. Specification of Letters Patent. Patented May 27, 1919.

Application filed June 16, 1916. Serial No. 104,065.

To all whom it may concern:

Be it known that I, JAMES LEONARD MOORE, of Wellsville, in the county of Allegany and in the State of New York, have invented a certain new and useful Improvement in Turbine-Buckets, and do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates particularly to buckets designed to be attached to turbine wheels driven by steam or some other elastic fluid.

The object of my invention is to provide a turbine bucket so constructed that it confines the jet of steam to the bucket so as to prevent the movement of the steam longitudinally with regard to the bucket, the parts being so constructed, however, as to prevent lateral strains in the portions of the bucket located at the outer ends thereof, and so that the strains are entirely radial in the buckets. A further object of my invention is to construct each of the buckets of such a shape that it will not only provide the necessary surface for receiving the force exerted by the steam, but also confine the steam to the said surface and prevent the movement of the steam longitudinally of the bucket while acting thereon. Further objects of my invention will appear from a detailed description thereof appearing hereinafter.

While my invention is capable of embodiment in many different forms, for the purpose of illustration I shall show only one form thereof in the accompanying drawings, in which,

Figure 1 is a perspective view of a bucket made in accordance with my invention;

Fig. 2 is a side elevation partly in section of a bucket wheel provided with buckets of this kind;

Fig. 3 is a plan view of the same; and

Fig. 4 is a transverse section of a bucket wheel such as that shown in Figs. 2 and 3.

In the drawings I have shown a bucket wheel 1 having a plurality of recesses 2, comprising a transversely directed cylindrical portion 3 and a similarly directed rectangular portion 4. In each of the recesses 2 there is supported a bucket 5 preferably made of a drop forging in a single piece of metal. Each of the buckets 5 comprises a shank 6 having a cylindrical portion 7 and a flat portion 8 adapted to fit in one of the recesses 2 and be riveted therein. Above the shank 6 the bucket is provided with a flange 9 which rests against the outer rim of the bucket wheel 1, and above the flange 9 there is a main body portion provided with a concave forward surface 10 and a convex rear surface 11. On the outer end of the bucket there is a flange 12 having on its forward face a recess 13 with sides 14 forming obtuse angles with a forward flat face 15 on the flange 12, and a flat face 16 connecting the two angular sides 14 together. On the rear edge of the flange 12 there is a projection 17 of such a shape as to fit in a recess 13 on one of the adjacent buckets.

In the operation of my invention the buckets, having been interlocked together by registering the projections 17 with the recesses 13, are inserted sidewise into the recesses 2 in the bucket wheel 1. When they have reached the correct position in said recesses the ends of the bucket shanks 3 and 4 are riveted over upon the chamfered edge 4′ of the recesses thereby securely fastening the buckets in place. Not only are the individual buckets fastened by the riveting of the particular shanks attached thereto, but the engagement of the buckets one with another by means of the projections 17 and the recesses 13 enables the riveting of the shank of any one of the buckets to assist in holding the other buckets in place. The passage of steam over the faces of the buckets drives the bucket wheel 1, while, at the same time, the tendency of the steam to escape from the bucket in a radial direction is prevented owing to the presence of the flanges 12. The construction is such, furthermore, that no lateral strains in the flanges 12, that is to say, in the direction of the periphery of the wheel 1, can take place, but the strains on said flanges are purely radial. This eliminates expense due to the repair of broken shroud rings such as those previously used for preventing the movement of the steam in a radial direction while impinging upon the buckets. Furthermore, the fact that each individual bucket is made in a single integral piece of metal gives it strength and obviates the repairs that would be necessary when using a number of different parts.

While I have described my invention above in detail, I wish it to be understood that many changes may be made therein without departing from the spirit thereof.

I claim:

1. A turbine bucket having a transverse flange on the outer end thereof, said flange

extending both forwardly and rearwardly of the body of the bucket, one of said extending portions being provided with a projection intermediate its sides, and the other extending portion having a recess complementary to said projection.

2. In combination a turbine wheel having a plurality of undercut slots in its periphery, a plurality of buckets each having a shank fitting one of said slots, each of said buckets being provided with a transverse flange on the outer end thereof, said flange being formed with a straight-sided projection on one side and a complementary recess in the intermediate portion of the other side, whereby the projection of one bucket engages the recess of the adjacent bucket.

3. A turbine bucket having a transverse flange on the outer end thereof, said flange being formed with a straight-sided projection on one side and a complementary recess in the intermediate portion of the other side.

4. A turbine bucket having a transverse flange on the outer end thereof, said flange being formed with a straight-sided projection on one side and a complementary recess in the intermediate portion of the other side, said recess overlying the body of the bucket.

5. A turbine bucket having a transverse flange on the outer end thereof, said flange being formed with a straight-sided tapering projection on one side and a complementary recess in the intermediate portion of the other side.

In testimony that I claim the foregoing I have hereunto set my hand.

JAMES LEONARD MOORE.

Witnesses:
R. E. MARSH,
H. D. STOVER.