A. C. PRATT.

BUCKET WHEEL.

APPLICATION FILED MAY 15, 1907.

910,311. Patented Jan. 19, 1909.

Fig. 1.

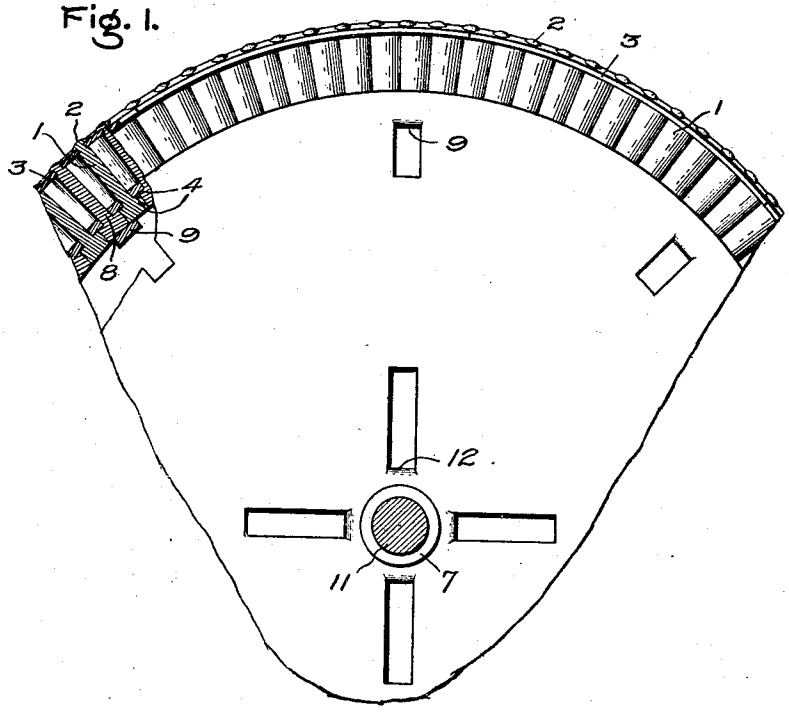


Fig. 2.

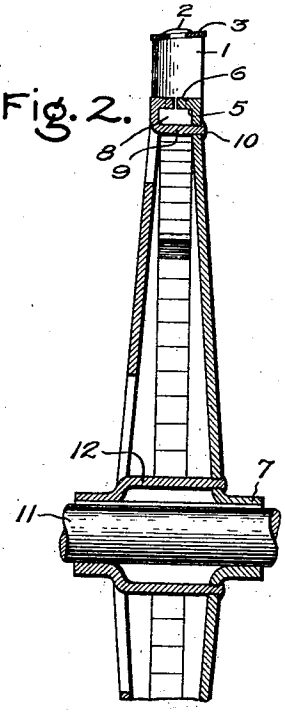


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

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BUCKET-WHEEL.

No. 910,311. Specification of Letters Patent. Patented Jan. 19, 1909.

Application filed May 15, 1907. Serial No. 373,844.

To all whom it may concern:

Be it known that I, ALPHONSO C. PRATT, a citizen of the United States, residing at Newark, county of Essex, State of New Jersey, have invented certain new and useful Improvements in Bucket-Wheels, of which the following is a specification.

The present invention relates to bucket wheels for steam turbines, and has for its object to provide a wheel which is cheap and simple in construction and at the same time is light and rigid.

For consideration of what I believe to be novel and my invention, attention is called to the specification and the claims appended thereto.

In the accompanying drawing, which illustrates one of the embodiments of my invention, Figure 1 is a partial view in side elevation with some of the parts broken away of a bucket wheel; Fig. 2 is a partial axial section of the same, and Fig. 3 is a partial plan view of the wheel with the bucket bases in section.

In carrying out my invention, I employ a plurality of individual buckets which may be made of any suitable material and by any desired process. The buckets 1 are of the usual cross-section and provided with tenons 2 that are riveted over to secure the cover or baffling strip 3 in place. Each bucket is provided with a base having oppositely disposed shoulders 4 that extend beyond the walls of the bucket measured in a plane perpendicular to the axis. The edges of the buckets are so cut away that shoulders 5 are formed in a plane parallel to the axis. By means of the shoulders 4 and 5 forming an enlarged head the individual buckets are firmly secured in place.

In order to form a web for the wheel that is simple and light in construction and at the same time very rigid and cheap to manufacture, I take two disks of sheet metal of suitable thickness and diameter and, by means of dies, form annular flanges 6 thereon and also a hub 7. Either before or after the flanging operation, slots are cut to receive the shanks 8 of the buckets so that when the two parts of the web are fastened together with the flanges extending toward each other the base portion of the buckets will be below the flanges and the body of the bucket outside of the flanges. The peripheral surface of the projections between the slots forms the inner wall of the bucket space or passage, and the projections themselves serve to engage the heads of the buckets and thus secure them in place.

In order to firmly secure the parts of the web together, tongues 9 are provided which are cut from a disk by a die and integral therewith at one end. The opposite end is bent around parallel to the axis of the wheel, and passes through a suitable opening in the opposite disk, where it is riveted over as at 10. As many of these tongues are provided as is necessary to firmly secure the parts. The same arrangement is provided near the shaft 11. In this case, the tongues 12 are somewhat longer owing to the fact that the disks gradually approach each other as they recede from the shaft. In the present instance, the tongues 12 are shown as being in the same plane with the tongues 9, but if desired, they can be off-set. I prefer to make all of the tongues in one of the disks since it decreases the cost of the dies, but if desired, some of the tongues may be formed in one disk and the remainder in the other.

In looking at the annular flanges 6 of the disks before the buckets are assembled, each flange will be found to have a notched edge which is opposite to the notched edge of the flange on the other disk. Between these notches are projections which serve as space blocks for the buckets and preserve the proper pitch relation.

In assembling the parts, one of the disks is placed on a suitable holder with the other disk placed on top, and after the buckets are inserted in place, by slightly raising the upper disk, the latter is forced downward so that the ends of the tongues 9 and 12 will pass through the openings in the opposite disk, after which they are riveted over at their ends. The cover is then applied to the ends of the buckets.

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. A bucket wheel comprising sheet metal disks having annular peripheral flanges that

extend toward each other, projections on the flanges with slots between, and buckets each having a shank and an enlarged head, the shanks passing through a slot and the head engaging the flanges on the disks.

2. A bucket wheel comprising sheet metal disks having annular peripheral flanges that extend toward each other, projections on the flanges with slots between, buckets each having a shank and an enlarged head, the shanks passing through a slot and the head engaging the flanges on the disks, and a covering for the outer ends of the buckets.

3. A bucket wheel comprising sheet metal disks having annular peripheral flanges whose outer faces form walls for the fluid passages between buckets, buckets having bases that engage the under side of the flanges and are held in place thereby, and means for securing the disks together to retain the bucket bases between the flanges.

4. A bucket wheel comprising sheet metal disks having annular peripheral flanges, buckets having bases that engage the flanges and are held in place thereby, and tongues formed integral with one disk that extend through the other disk and are riveted over to unite them.

5. A bucket wheel comprising sheet metal disks having annular peripheral flanges, buckets having bases that engage the flanges, tongues formed integral with one disk near its periphery which pass through the other disk and are riveted over, and a second set of tongues formed integral with one disk near its axis which pass through the other disk and are riveted over.

6. A bucket wheel comprising a pair of sheet metal disks having opposed annular flanges formed integral therewith and outwardly extending hubs also formed integral therewith, said flanges forming the bottom walls of the bucket spaces, buckets having bases which are engaged and held by the inner surfaces of the flanges, and means for securing the disks together.

7. A bucket wheel comprising a pair of sheet metal disks having opposed annular flanges formed integral therewith and outwardly extending hubs also formed integral therewith, said flanges forming the bottom walls of the bucket spaces, buckets having bases which are engaged and held by the inner surfaces of the flanges, means for securing the disks together, and a cover or shrouding for the ends of the buckets.

In witness whereof, I have hereunto set my hand this thirteenth day of May, 1907.

ALPHONSO C. PRATT.

Witnesses:

G. ROWLAND MUNROE.

ROSALIE KAPLAN.