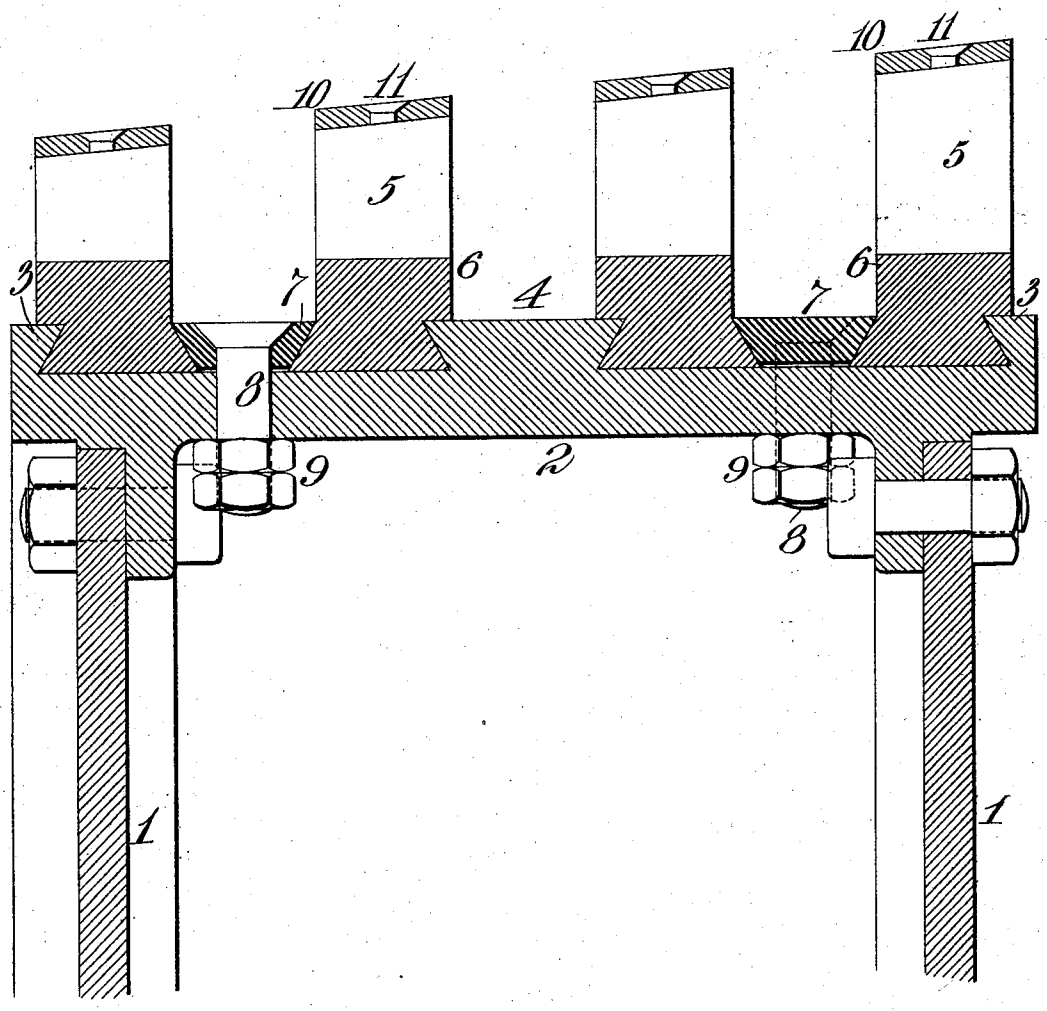
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C. G. CURTIS.

ELASTIC FLUID TURBINE.

APPLICATION FILED AUG. 1, 1902.

NO MODEL.



Witnesses:

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

No. 747,857. Patented December 22, 1903.

UNITED STATES PATENT OFFICE.

CHARLES G. CURTIS, OF NEW YORK, N. Y.

ELASTIC-FLUID TURBINE.

SPECIFICATION forming part of Letters Patent No. 747,857, dated December 22, 1903.

Application filed August 1, 1902. Serial No. 117,957. (No model.)

To all whom it may concern:

Be it known that I, CHARLES G. CURTIS, a citizen of the United States, residing in the borough of Manhattan, city of New York, State of New York, have invented a certain new and useful Improvement in Elastic-Fluid Turbines, of which the following is a description.

The object I have in view is to produce a simple and effective construction for the movable vanes of elastic-fluid turbines and for securing them in position upon the turbine-wheel.

In the accompanying drawing is shown a radial section through the movable vanes and the wheel-rim to which they are secured.

1 1 are the disks which form the web of the wheel and to which is bolted the wheel-rim 2, made in a single piece or in curved sections. The wheel-rim is provided with outwardly-projecting ribs 3 at its edges, having inclined inner faces, and with a central rib 4, also having its side faces inclined, the channels between the ribs 3 and 4 being dovetailed channels having a width sufficient to receive the bases of two sets of movable vanes. The movable vanes 5 are cut in the outer surface of curved vane-blocks, leaving the inner portions of the block solid, these solid inner portions forming bases 6, from which the vanes 5 project outwardly. The vane-bases 6 are beveled in opposite directions on their sides, so as to form dovetailed sections which engage with the dovetailed channels of the wheel-rim. Two sets of vane-blocks are placed in each dovetailed channel, engaging the outer beveled sides of the channel, and between the vane-blocks in each channel is placed a key-block 7, having beveled sides engaging the beveled sides of the vane-bases 6. The key-blocks 7 have the curved form of the wheel-rim and are made in sections of suitable length, breaking joints with the joints between the vane-blocks. The key-blocks 7 are secured in place by bolts 8, which pass through the wheel-rim and receive nuts 9 on their inner ends inside the wheel-rim. By means of the bolts and nuts the beveled key-blocks 7 are drawn toward the wheel-rim, forcing the vane-bases outwardly against the beveled sides of the dovetailed channels and securing the vanes rigidly in place. The outer ends of the vanes are encircled by bands 10, which are preferably secured in place by means of rivets 11, made integral with the ends of the vanes.

It is evident that this construction is adapted for any desired number of movable vanes.

What I claim is—

1. In an elastic-fluid turbine, the combination with a wheel-rim having a dovetailed channel of greater width than the vane-bases and extending entirely around the wheel-rim, of dovetailed vane-bases inserted in said channel on one side thereof, each vane-base carrying a number of vanes, and beveled locking-keys securing the vane-bases in the dovetailed channel of the wheel-rim, substantially as set forth.

2. In an elastic-fluid turbine, the combination with a wheel-rim having a dovetailed channel wide enough to accommodate two vane-bases, of two dovetailed vane-bases carrying movable vanes located in said channel on opposite sides, and a beveled key placed between the vane-bases and forcing them outwardly in said dovetailed channel, substantially as set forth.

3. In an elastic-fluid turbine, the combination with the wheel-rim having a dovetailed channel wide enough to accommodate two sets of vane-bases, of the dovetailed vane-bases 6 placed in said channel, the beveled key 7, and the bolts 8 drawing said key inwardly against the adjoining beveled sides of the vane-bases, substantially as set forth.

4. In an elastic-fluid turbine, the combination with a wheel-rim having a dovetailed channel of greater width than the vane-bases and extending entirely around the wheel-rim, of dovetailed vane-bases inserted in said channel on one side thereof, each vane-base carrying a number of vanes, beveled locking-keys securing the vane-bases in the channel, and an encircling band secured to the outer ends of the vanes, substantially as set forth.

5. In an elastic-fluid turbine, the combination with a wheel-rim having a dovetailed channel of greater width than the vane-bases and extending entirely around the wheel-rim,

of dovetailed vane-bases inserted in said channel on one side thereof, each vane-base carrying a number of vanes, beveled locking-keys securing the vane-bases in the channel, and an encircling band secured to the outer ends of the vanes by studs formed integral with the vanes, substantially as set forth.

This specification signed and witnessed this 25th day of July, 1902.

CHARLES G. CURTIS.

Witnesses:
JNO. ROBT. TAYLOR,
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