To all whom it may concern:

Be it known that I, JOHN EDWIN SNYDER, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Interlocking Blade Shrouds, of which the following is a specification.

This invention relates to blade shrouds such as are employed in turbines for locking together and shrouding the outer ends of blades, and particularly as employed in connection with impulse blading.

The movable blades of a turbine are subjected not only to a relatively high centrifugal stress, but also to a bending stress caused by the force of the motive fluid acting on the blades. It is well known that unless securely locked together, the blades will whip or vibrate, particularly so in turbines of large size which are adapted to operate at relatively high speed.

An object of my invention is to produce a new and improved blade shroud by means of which the outer ends of movable blades may be shrouded and securely locked together.

A further object is to produce a new and improved interlocking blade shrouding which is stronger, more simple and easier to assemble than other blade shrouding now in use and known to me.

These and other objects which will be made apparent throughout the further description of my invention are attained by means of apparatus embodying the features herein described and illustrated in the drawings accompanying and forming a part hereof.

In the drawings: Fig. 1 is a perspective view of a blade shrouding embodying my invention.

Fig. 2 is a perspective view of a modification of the shrouding illustrated in Fig. 1.

Fig. 3 is a perspective view of a locking member employed in connection with the shrouding illustrated in Fig. 2.

In Fig. 1 I have illustrated a row of blades 5, each of which is provided with a shroud forming tip or head 6. As illustrated, the blade tips 6 are concave on the forward side and convex on the rear, the curvature being such that the tips nest together and form a continuous shroud over the ends of the blades. This arrangement insures the proper spacing of the blades and eliminates the separately attached shroud sometimes employed with such blading.

As shown, the concave rear face of each blade tip 6 is provided with an integrally formed key 7 of bulb cross-section which is adapted to fit in a similarly shaped groove or slot 8 in the convex or forward face of the adjacent blade tip and to thereby securely lock the tips together. The blades 5 may be assembled by sliding the key 7 of one blade into the slot 8 of another, and so on. After a row of blades are assembled they may then be mounted on the rotor or turbine element in any suitable manner.

In Fig. 2 I have illustrated a row of blades 9 having integrally formed shrouding members or tips 10 similar to those illustrated in Fig. 1 and adapted to nest together in the same manner. However, the interlocking arrangement for the shrouding members 10 comprises, as illustrated, a separate key 11 which is adapted to fit in grooves 12 in adjacent faces of the blade tips 10 and to thereby securely lock the tips together.

In Fig. 3 I have separately illustrated the key 11. As shown, it is of double cross-section, the slots 12 in the shroud members 10 being of similar cross-section when matched together as the blades are assembled. By double bulb cross-section, I mean two cylindrical portions which are connected by a relatively narrow web, although it is evident that T, triangular, or any other form of enlarged head may be employed on the interlocking key if desired.

The construction illustrated in Fig. 2 enables the blades to be assembled on the rotor or other turbine element in the usual manner, the key 11 being subsequently driven in so as to interlock the shroud members and form, in effect, a continuous and rigid shroud, which may be easily and cheaply manufactured.

While I have shown my invention in but two forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications, without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.
What I claim is:

1. In combination with the impulse blades of a turbine, a shroud member formed on the end of each blade and having convex and concave faces formed to cooperate with the faces of adjacent blades, and an interlocking key for locking adjacent faces together.

2. A shroud member for blading having faces for cooperating with adjacent faces of other blades, and an interlocking key for rigidly locking said adjacent faces together.

3. A shroud member for blading having faces for cooperating with adjacent faces of other blades, and an interlocking laterally extending key for rigidly locking said adjacent faces together.

4. In combination, a turbine blade, a shroud member formed thereon and cooperating with other shroud members to form a continuous shroud, and a key following the contour of the shroud members for locking said members together.

5. In combination with the impulse blades of a turbine, a shroud member formed on the end of each blade and having convex and concave faces formed to cooperate with the faces of adjacent blades, and an interlocking key for locking adjacent faces together and following the curvature of said faces.

In testimony whereof, I have hereunto subscribed my name this 29th day of September, 1920.

JOHN EDWIN SNYDER.