C. F. BARTH.

STEAM TURBINE.

APPLICATION FILED MAR. 1, 1909.

995,397. Patented June 13, 1911.

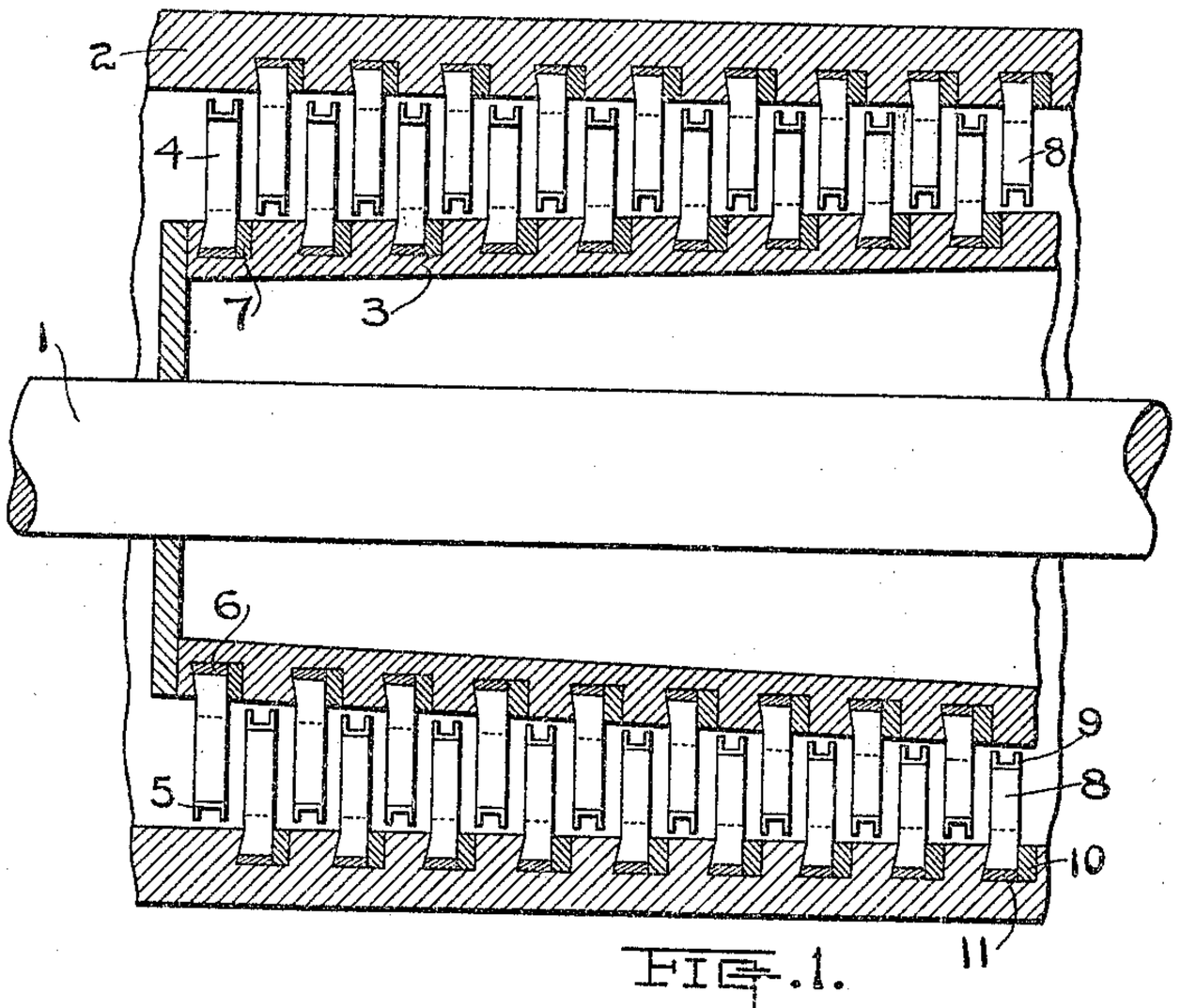

FIG. 1.

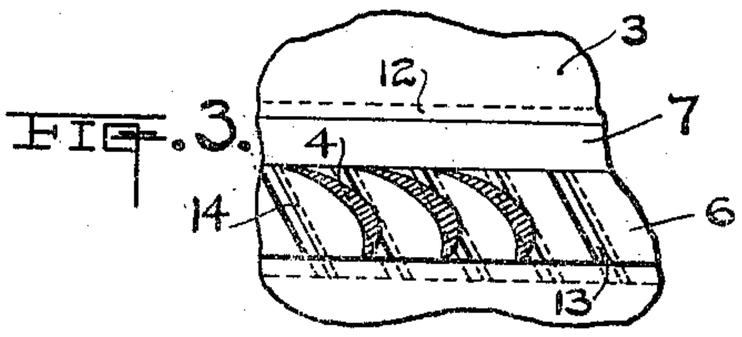

FIG. 3.

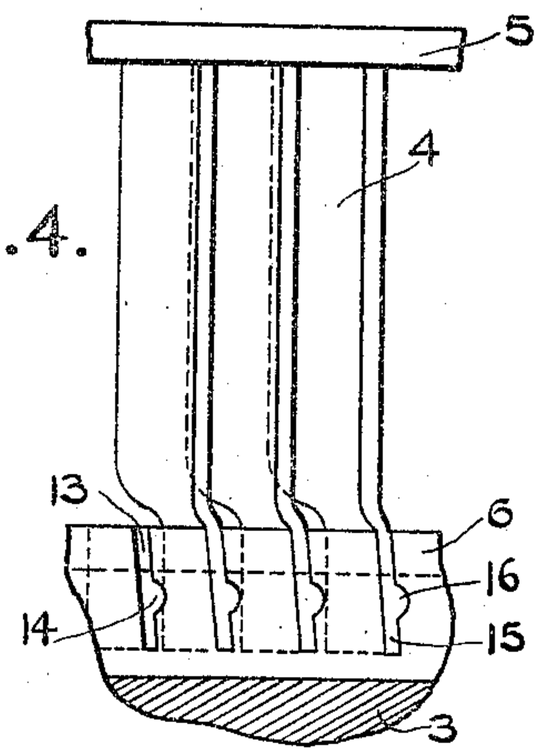

FIG. 4.

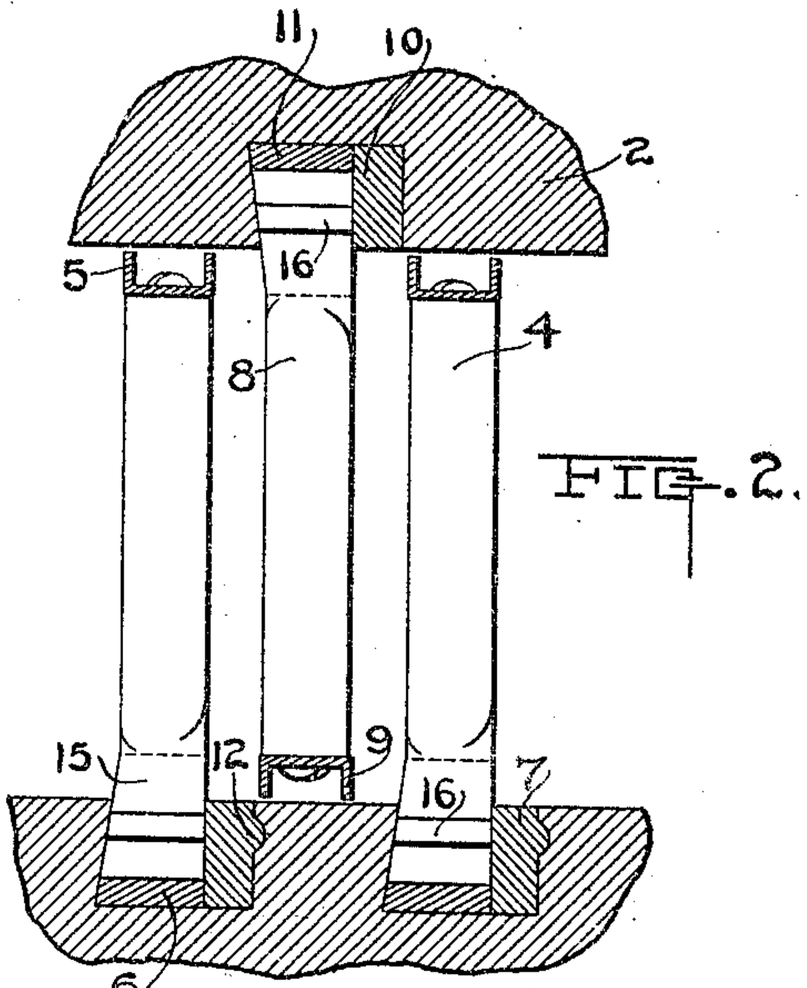

FIG. 2.

WITNESSES.

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UNITED STATES PATENT OFFICE.

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STEAM-TURBINE.

995,397. Specification of Letters Patent. Patented June 13, 1911.

Application filed March 1, 1909. Serial No. 480,514.

To all whom it may concern:

Be it known that I, CHARLES F. BARTH, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a certain new and useful Improvement in Steam-Turbines, of which the following is a specification.

This invention relates to improvements in the construction of fluid pressure turbines.

The object of the invention is to produce a simple means for fastening a series of blades into a continuous base, either casing or spindle of a turbine, by fastening the blades to an independent holding ring and then fastening said holding ring into the casing or spindle.

A clear conception of the invention can be obtained by reference to the accompanying drawings in which like reference characters designate like parts in different views.

Figure 1 is a fragmental, central, vertical section of a turbine built according to the invention. Fig. 2 is an enlarged fragment of the device shown in Fig. 1, and shows several blades and their fastenings. Fig. 3 is an enlarged fragmental sectional development of the spindle. Fig. 4 is a fragmental sectional side view of several of the blades and their fastenings.

The spindle 3 is mounted concentrically upon the shaft 1 in any suitable manner, and carries the several series of movable blades 4. These blades 4 extend radially from the shaft 1 and increase in size as they approach the exhaust end of the turbine, see Fig. 1. The outer ends of the blades 4 are fastened to ring shroudings 5 which are also concentric with the shaft 1. The inner ends 15, having projections 16, coact in slots 13 and notches 14 which are cut in the rings 6. These rings 6 are fitted into dovetail shaped grooves in the spindle 3 and are held therein by the calking strips 12. The calking strips 12 are prevented from being displaced by the action of centrifugal force, by the projections 12 coacting in annular grooves in the spindle 3.

The casing 2 has its interior surface concentric with the shaft 1 and supports the several series of stationary blades 8. These blades 8 are placed radially to the shaft 1, there being a series of blades 8 between each concentric series of blades 4. The outer ends of the blades 8 are fastened to ring shroudings 9 which are concentric with the shaft 1. The inner ends of the blades 8 having the projections 16 thereon, coact in slots in the ring 11, the projections 16 coacting in corresponding notches. The ring 11 is held into a dovetail shaped groove in the casing 2 by the calking strip 10.

It is preferred to have the slots 13 formed oblique to the peripheral surface of the ring, thus necessitating a slight bend in the blade to place the blades radial. This bend which should be toward the notch 14, gives an added holding effect to the notch 14. In other words, the notch is formed in the slot wall acute to the peripheral surface of the ring.

In constructing the turbine, the slots are cut into the holding rings 6, 11. The blades 4, 8, are then pressed into the slots 13, the projection 16 coacting with the notch in the rings 6, 11. The rings 6, 11, are then inserted into the slots cut into the spindle 3, or casing 2, and the calking strips are calked into place.

It should be understood that it is not desired to be limited to the exact details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

It is claimed and desired to secure by Letters Patent:

1. The combination of a base having a groove therein, a holding ring having a slot, a blade fastened to said ring in said slot, the fastening being substantiated by said ring and blade alone by said parts being formed with positive interlocking portions, and a calking strip for holding said ring in said groove.

2. A base having a groove, a holding ring having a slot and having a notch in a wall of said slot, a blade having a projection, the end of said blade coacting with substantially all of both sides of said slot and said projection coacting with said notch, and a calking strip for holding said ring in said groove.

3. A base having a groove, a holding ring having a slot oblique to said peripheral

surface of said ring and having a notch in the wall of said slot acute to said peripheral surface, a blade having a projection, the end of said blade coacting with said slot and said projection coacting with said notch, and a calking strip for holding said ring in said groove.

In testimony whereof, I affix my signature in the presence of two witnesses.

CHARLES F. BARTH.

Witnesses:
H. C. CASE,
G. F. DEWEIN.