

H. B. KARLIN.  
ELASTIC FLUID TURBINE.  
APPLICATION FILED MAR. 20, 1908.

905,437.

Patented Dec. 1, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

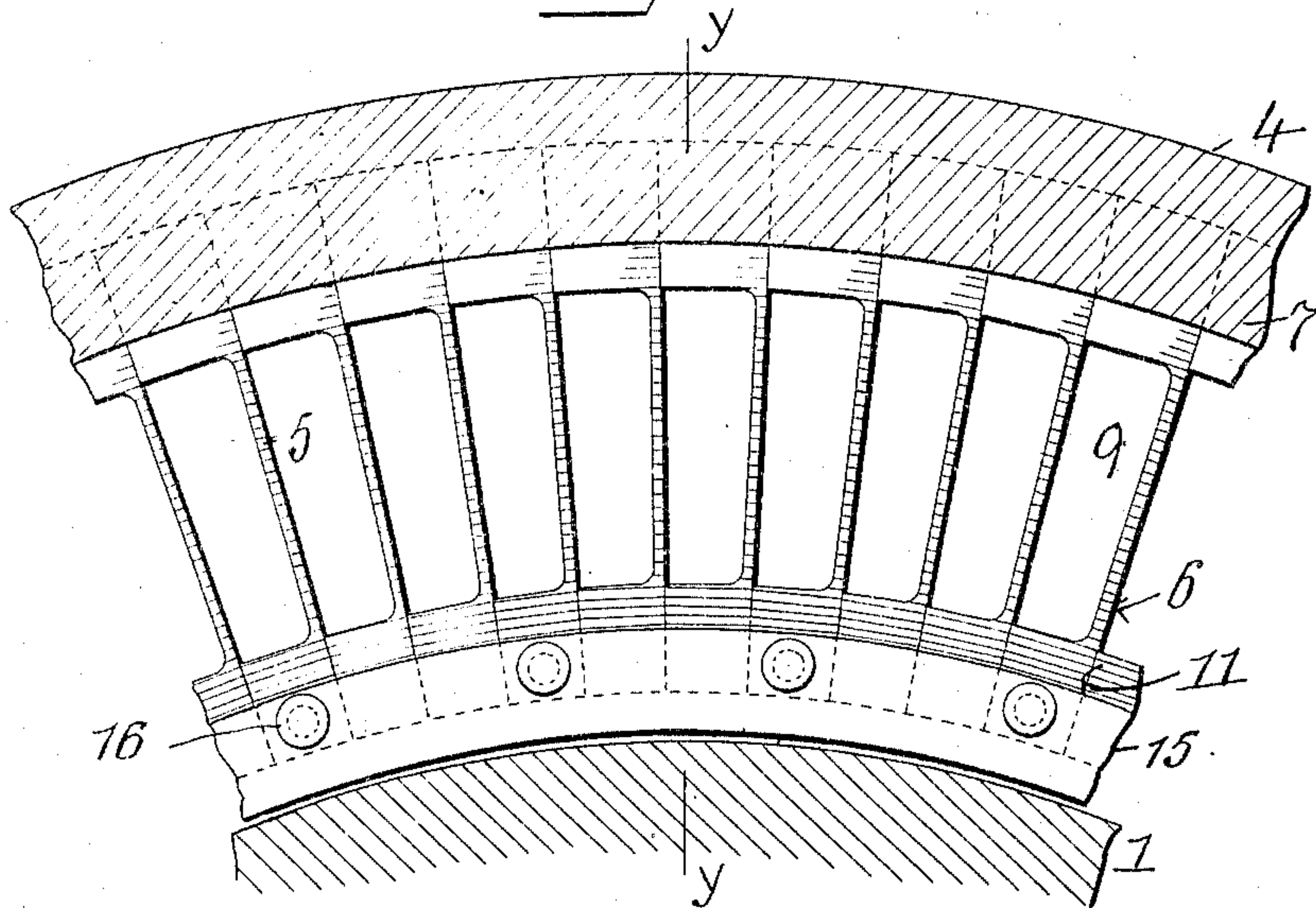
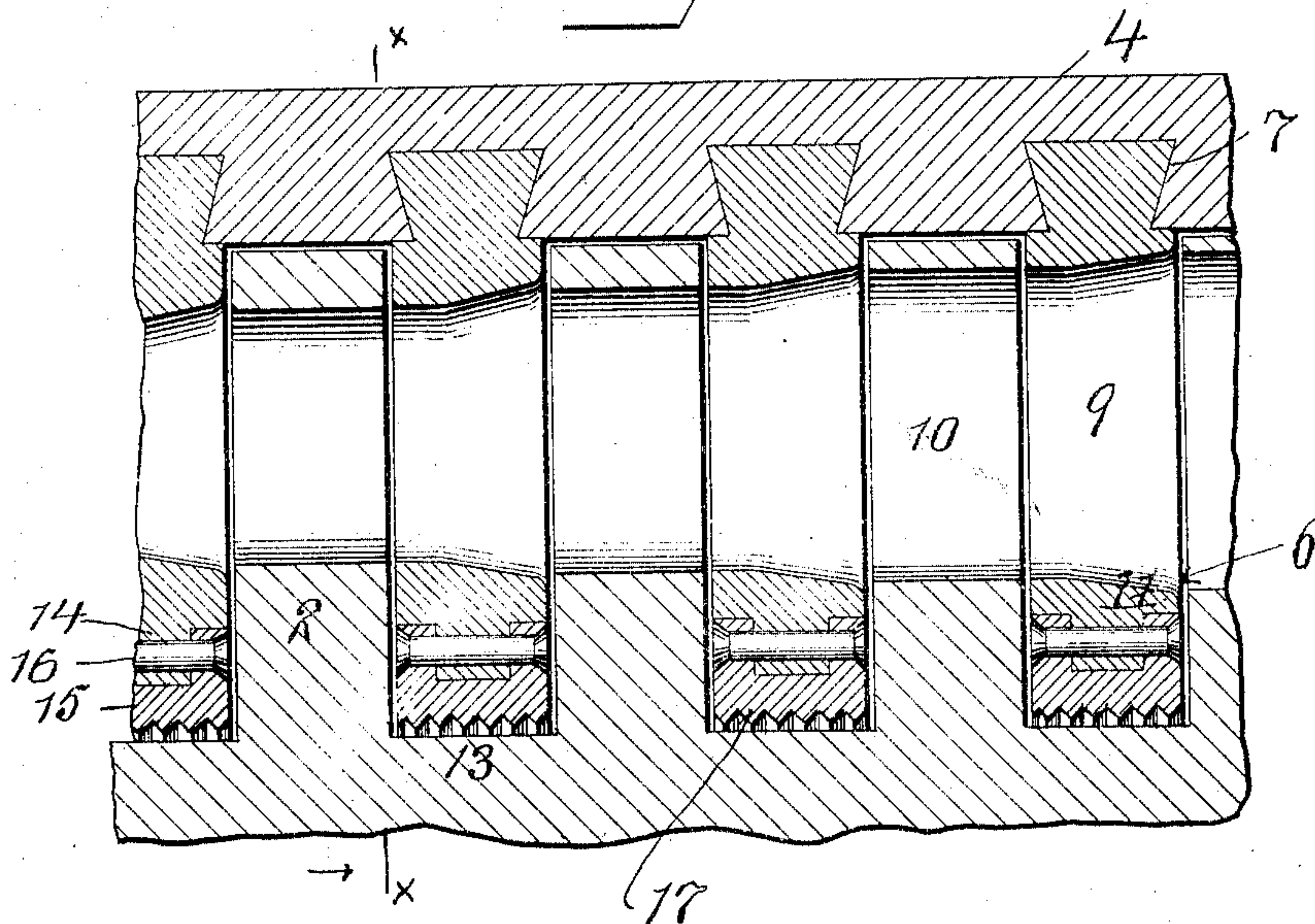


Fig. 2.



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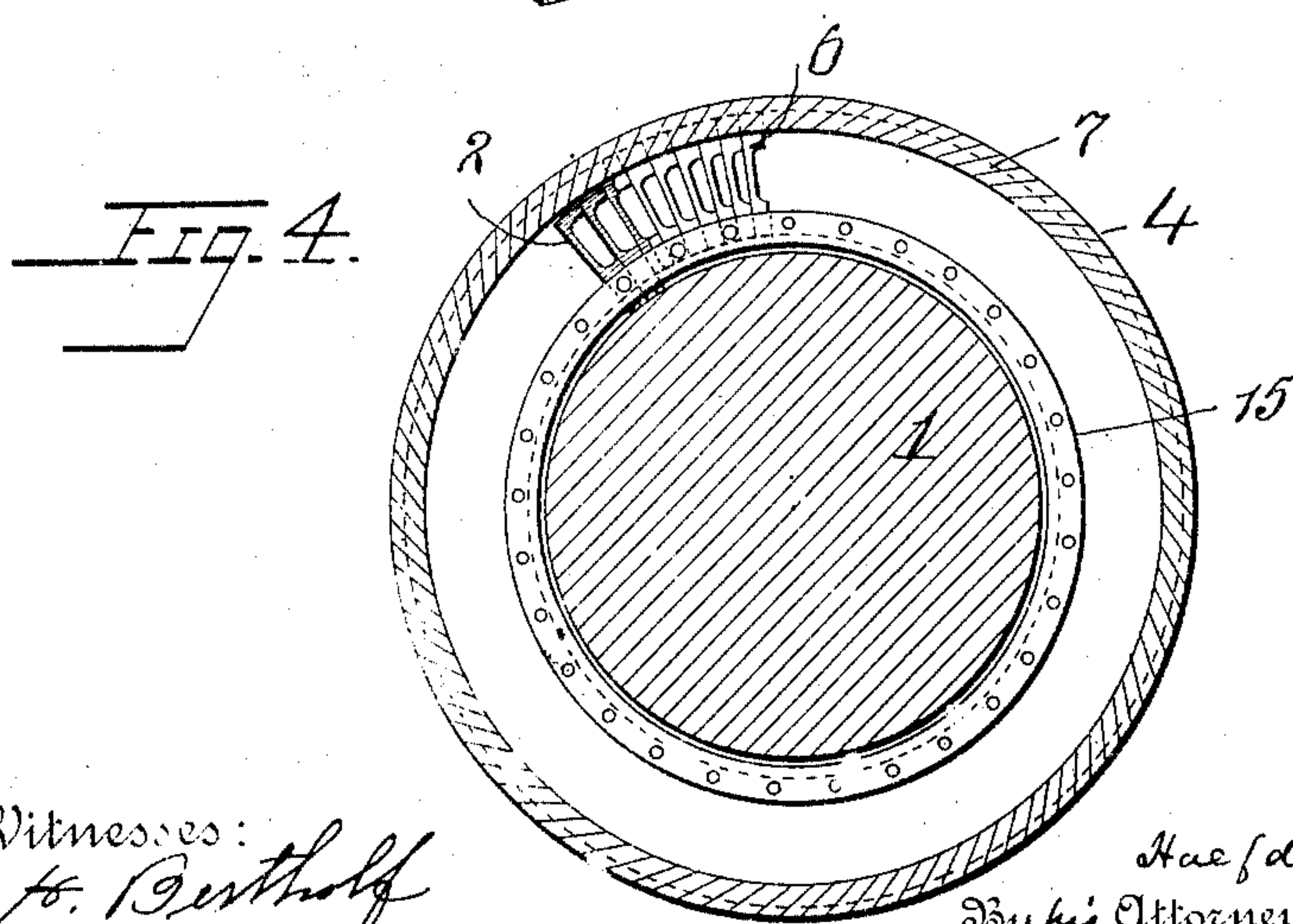
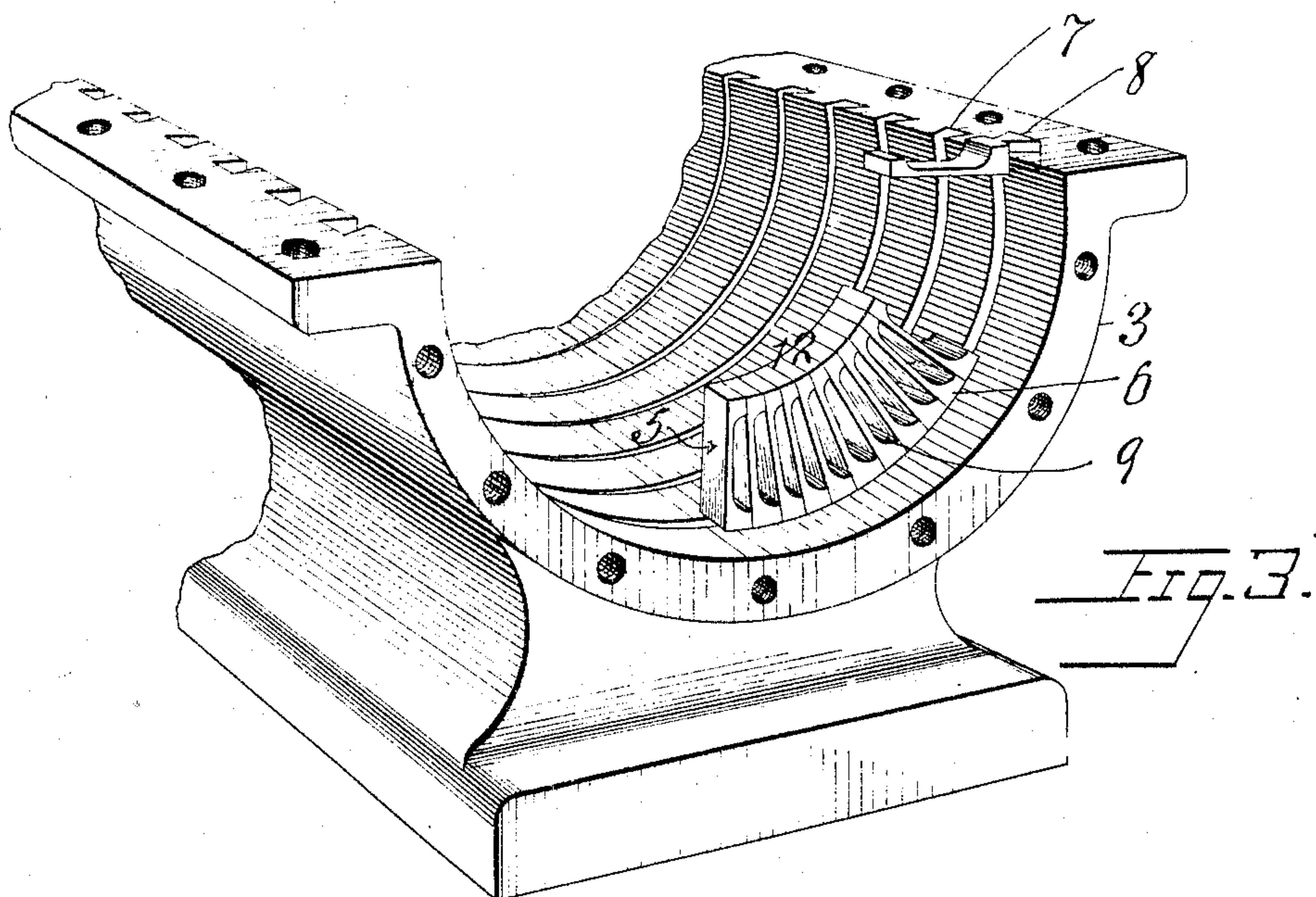
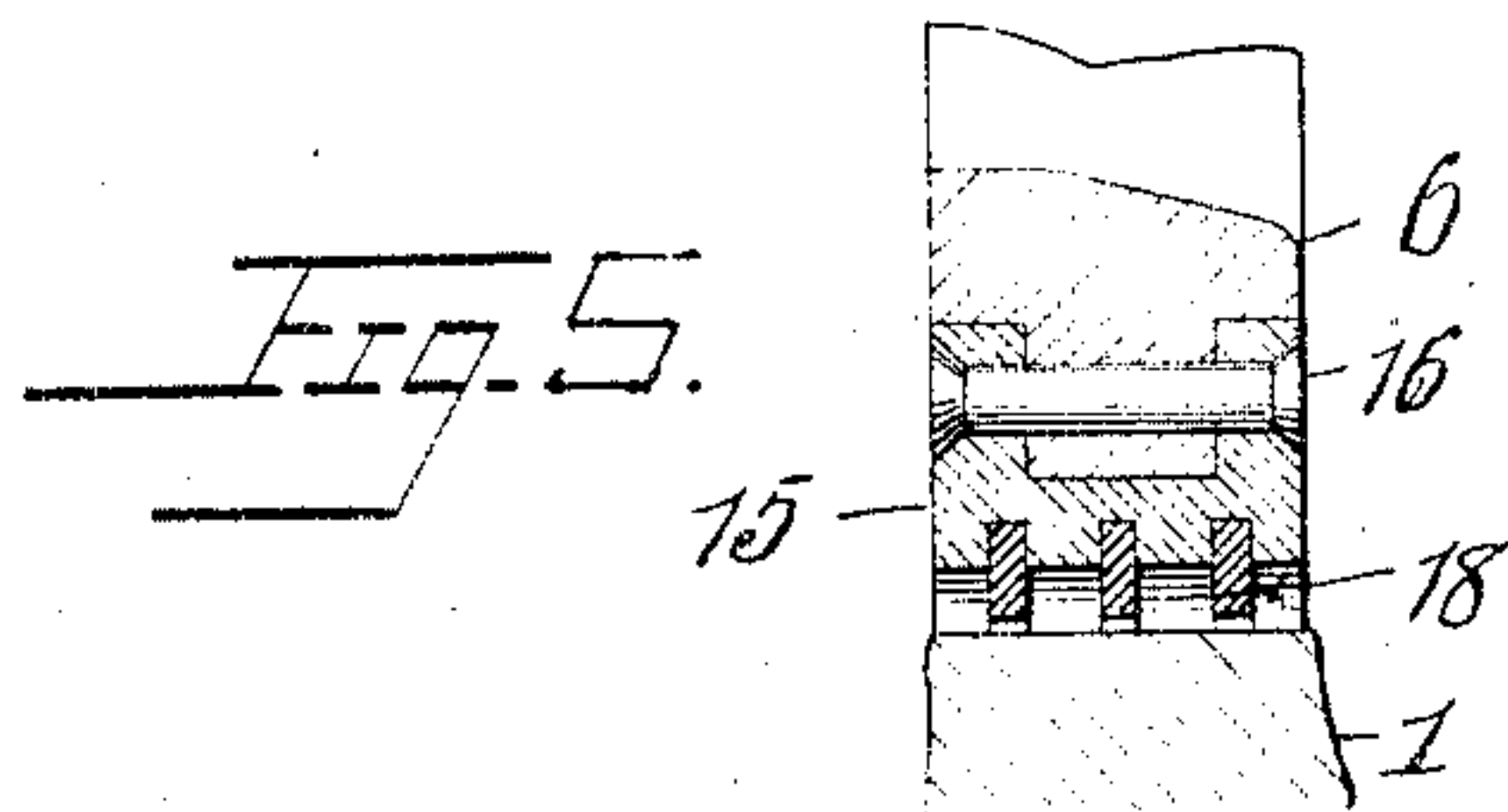
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By his Attorney  
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SHEETS-SHEET 2



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# UNITED STATES PATENT OFFICE.

HALFDAN BIRGER KARLIN, OF STOCKHOLM, SWEDEN.

## ELASTIC-FLUID TURBINE.

No. 905,437.

Specification of Letters Patent.

Patented Dec. 1, 1908.

Application filed March 20, 1908. Serial No. 422,219.

To all whom it may concern:

Be it known that I, HALFDAN BIRGER KARLIN, engineer, a citizen of Sweden, residing at Stockholm, Sweden, have invented a certain new and useful Improvement in Elastic-Fluid Turbines, of which the following is a specification.

The invention relates to elastic fluid turbines and more particularly to the rings of guide blades which project inwardly from the cylindrical casing or shell, and alternate with the rings of buckets on the wheel.

The invention consists in the mode of securing the guide blades to the casing, the arrangement of said blades in contact to form rings, and the combination with the blades of a lining or tightening annular piece which forms a joint with the wheel between the rings of buckets thereon.

In the accompanying drawings—Figure 1 is a face view of a part of the ring of fixed guide blades, with the casing and wheel in section on the line *xx* of Fig. 2. Fig. 2 is a section on the line *yy* of Fig. 1. Fig. 3 is a perspective view of the lower half of the turbine casing showing part of a ring of guide blades in position. In this figure the edge ring 15 is omitted. Fig. 4 is a cross section of wheel and casing showing part of a ring of guide blades on the casing and part of a ring of buckets on the wheel. Fig. 5 is a modified form of joint between wheel periphery and guide blade.

Similar numbers of reference indicate like parts.

1 is the turbine wheel having on its periphery rings 2 of buckets, secured in place in any suitable way.

The wheel casing 4 is preferably formed in two horizontally divided sections, united in the usual way by bolts passing through side flanges. The lower section 3 is shown in Fig. 3. On the inner periphery of the casing are secured rings 6 of guide blades which, when the wheel is in place, alternate with the bucket rings 2 on said wheel, as shown in Fig. 2.

Each ring 6 of guide blades is secured to the casing in the following manner. On the inner periphery of the casing is formed a dovetailed groove 7. Each blade has a dovetailed shank constructed to fit in said groove. The blades may be introduced into the groove from one end thereof as shown at 8 Fig. 3 and are adjusted in contact so that the dovetails completely fill the groove.

In the blades are passages 9 for axial flow of motor fluid, which passages 9 register in the usual way with similar passages 10 in the wheel buckets. The passage 9 in each blade is closed by the solid back 5 of the next adjacent blade. At the inner end of each blade is a solid portion 11, and these solid portions come together to form a substantially solid ring 12 which immediately incloses the portion 13 of the turbine wheel which lies between the rings 2 of wheel buckets.

In order to form working joints between the rings of guide blades and the portions 13 of the turbine wheel, I provide for each ring of guide blades, an annular lining piece 15 which may be secured in place in any suitable way.

Preferably the portion 11 of each blade has formed on its end a tenon 14 and the tenons 14 unitedly form a rib which enters a circumferential groove in the lining piece 15, which ring is preferably made in two half sections corresponding to the half sections of the casing. The tenons are fastened in the groove by transverse rivets 16.

The inner surface of the lining piece 15 may be threaded as shown in Fig. 2 at 17, or provided with a plurality of annular channels and intervening projections 18 as shown in Fig. 5, so that a tightening joint of the labyrinth type is formed between lining piece and wheel.

I claim:

1. In an elastic fluid turbine, a cylindrical blade-carrying turbine member, blades disposed in contact to form a ring coaxial with said member and secured therein, and an annular lining piece in said ring.

2. In an elastic fluid turbine, a cylindrical blade-carrying turbine member, blades disposed in contact to form a ring coaxial with said member and secured therein, and an annular lining piece in said ring having channels and intervening projections on its inner circumferential face.

3. In an elastic fluid turbine, a cylindrical blade-carrying turbine member, blades disposed in contact to form a ring coaxial with said member and secured therein, a tenon on each blade, the said tenons forming conjointly a rib on the inner circumferential face of said ring, an annular lining piece in said ring having a groove receiving said rib and means for connecting said rib and lining piece.



4. In an elastic fluid turbine of the type  
in which rings of buckets on a rotary cylinder  
alternate with rings of guide blades  
fixed on the inner periphery of a cylindrical  
5 casing, an annular lining piece secured in  
each guide blade ring and having, on its  
inner circumferential face, channels and intervening  
partitions forming a joint with

the circumferential periphery of said cylinder.

In testimony whereof I have affixed my  
signature in presence of two witnesses.

HALFDAN BIRGER KARLIN.

Witnesses:

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