

No. 791,860.

PATENTED JUNE 6, 1905.

H. L. BARTON.
FLUID PRESSURE TURBINE.
APPLICATION FILED MAY 18, 1904.

Fig. 1.

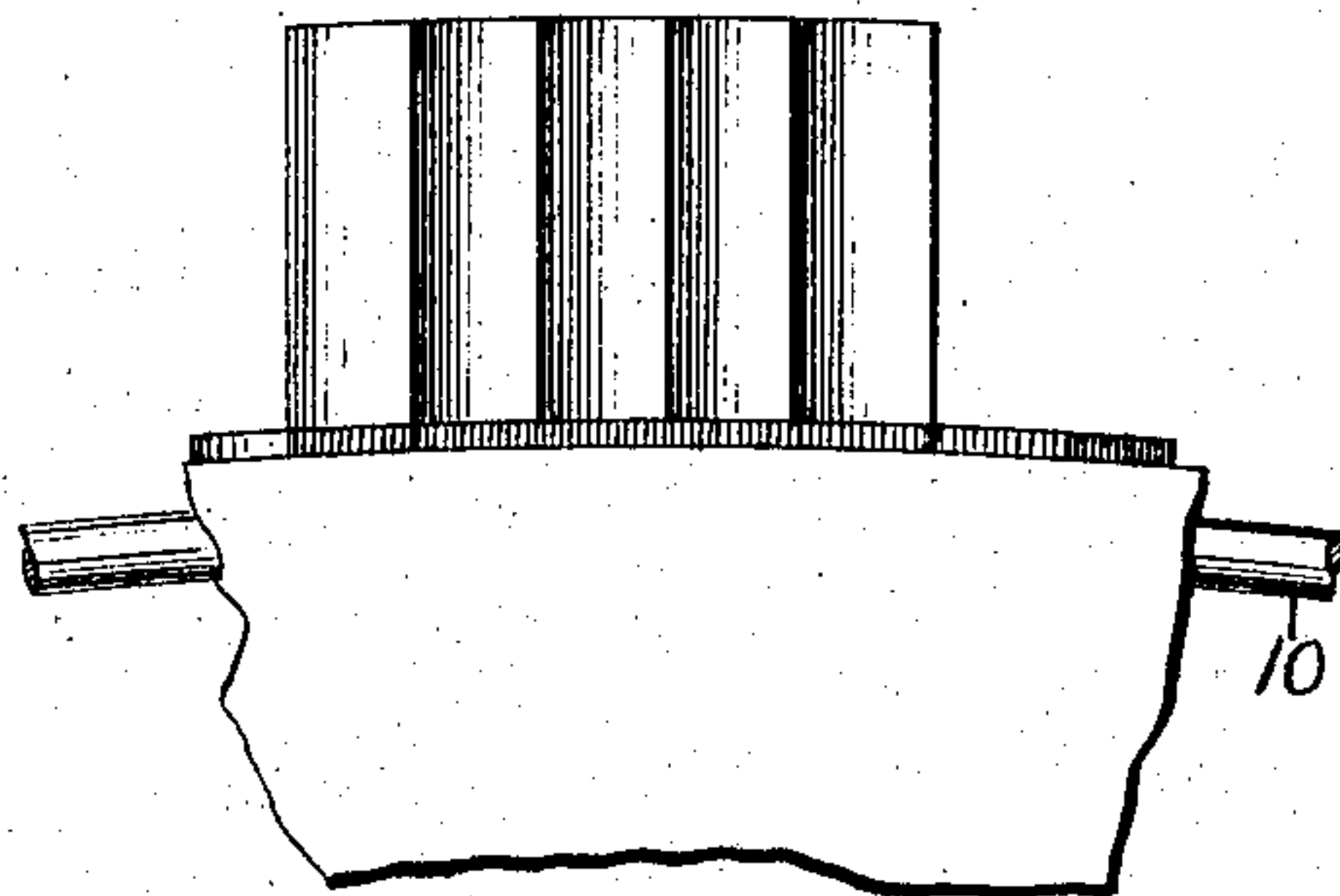


Fig. 4.

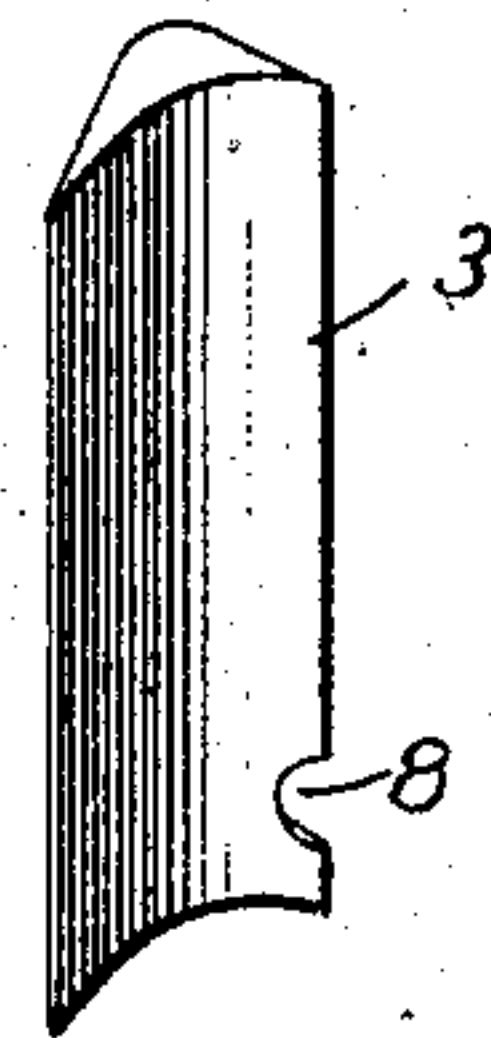


Fig. 3.

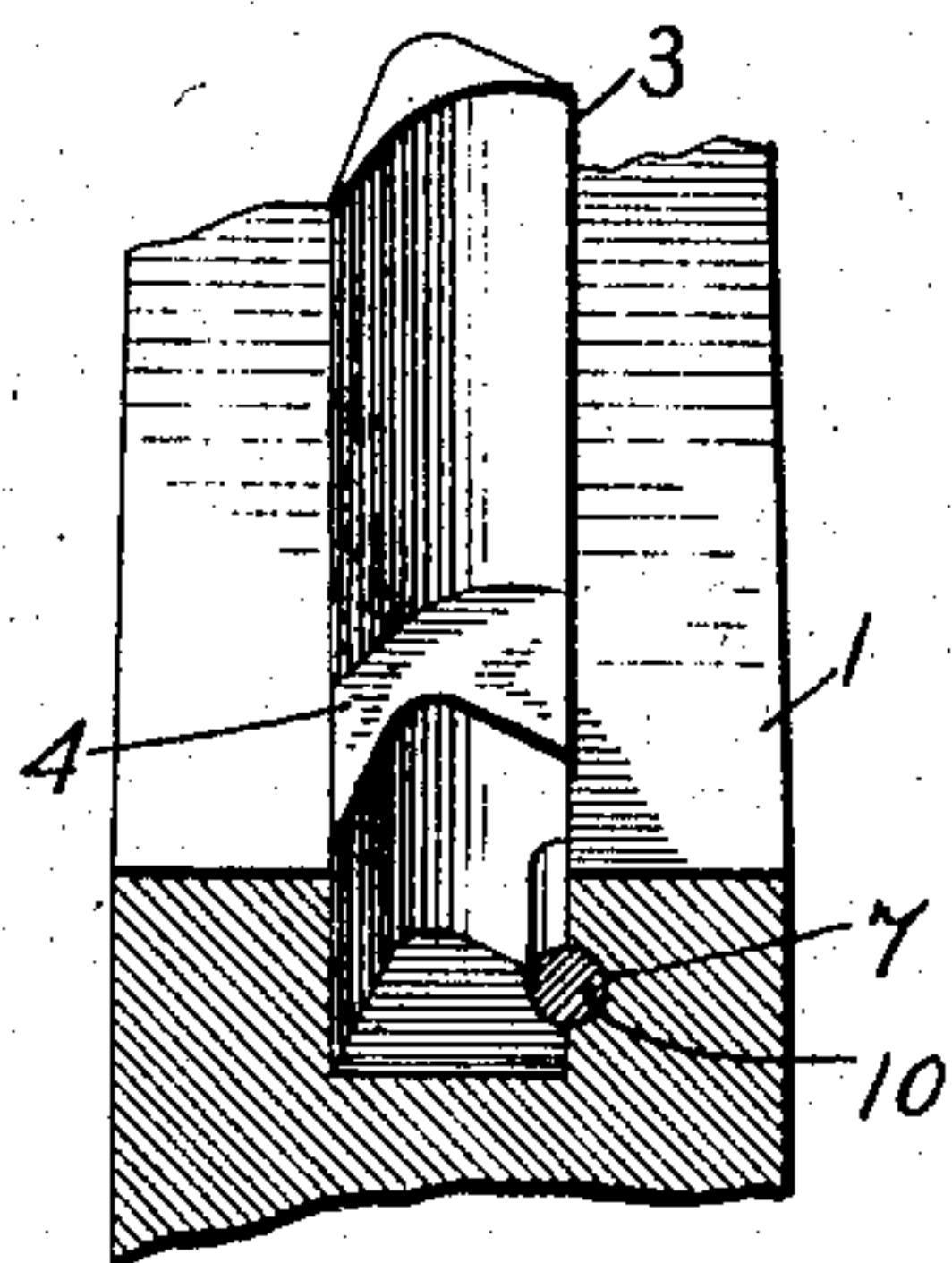


Fig. 2.

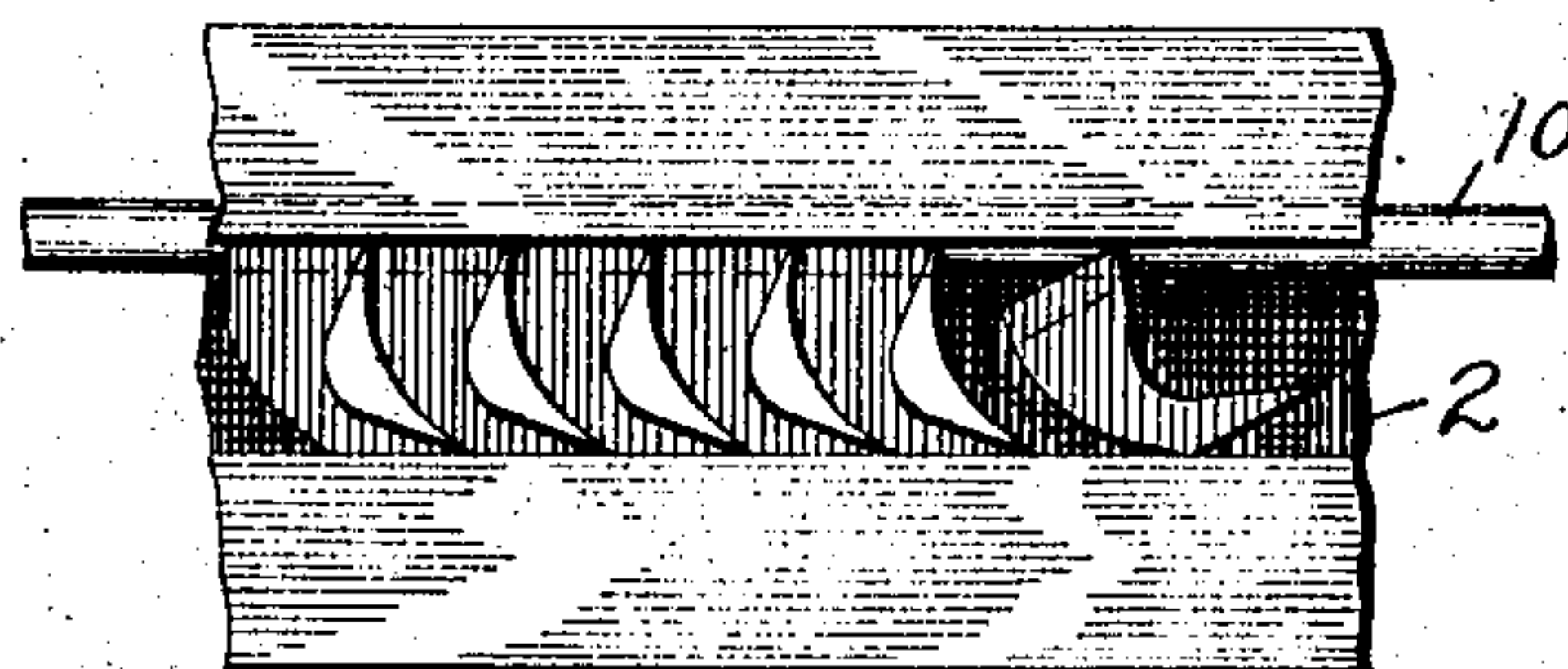


Fig. 5.

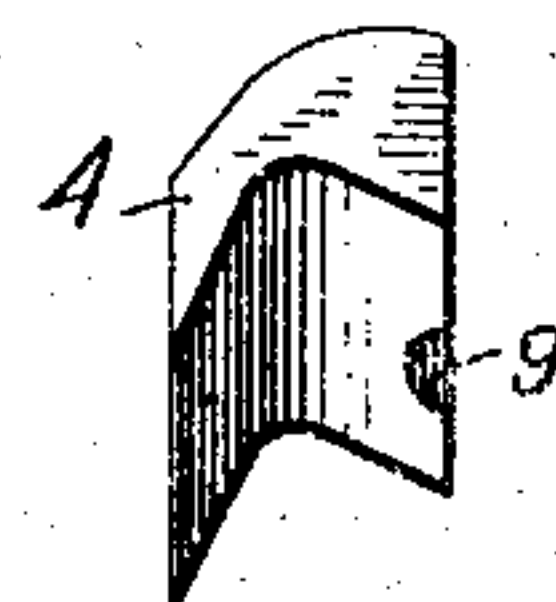
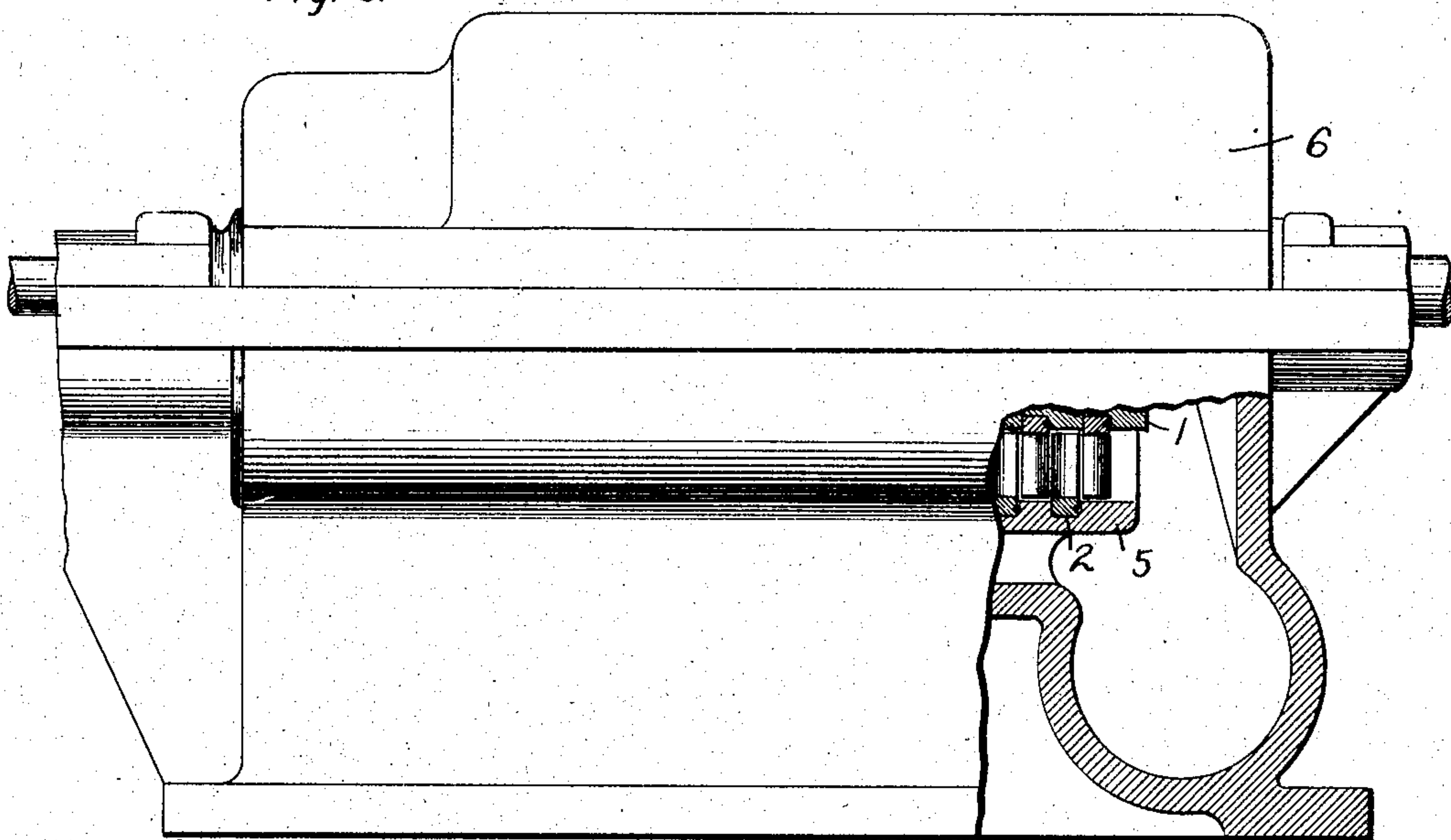


Fig. 6.



WITNESSES:

Fred. H. Miller
Birney Hines

INVENTOR

Henry L. Barton

BY

Wesley E. Carr
ATTORNEY

UNITED STATES PATENT OFFICE.

HENRY L. BARTON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO
THE WESTINGHOUSE MACHINE COMPANY, A CORPORATION OF
PENNSYLVANIA.

FLUID-PRESSURE TURBINE.

SPECIFICATION forming part of Letters Patent No. 791,860, dated June 6, 1905.

Application filed May 18, 1904. Serial No. 208,585.

To all whom it may concern:

Be it known that I, HENRY L. BARTON, a citizen of the United States, and a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Fluid-Pressure Turbines, of which the following is a specification.

My invention relates to fluid-pressure turbines, and particularly to means for securing the vanes or blades of such engines in position.

The object of my invention is to provide a means for securely attaching blades or vanes to the stationary and to the rotatable member of a fluid-pressure turbine or to either of the said members which shall permit of ready insertion and removal of said parts.

With these ends in view I have devised the means shown in the accompanying drawings, in which—

Figure 1 is an end elevation of a portion of a drum and a plurality of vanes or blades mounted thereon in accordance with my invention. Fig. 2 is a plan view of substantially what is shown in Fig. 1. Fig. 3 is a perspective view of a portion of a drum and a single vane or blade and a spacing-block anchored in position by my locking means. Fig. 4 is a perspective view of one of the blades or vanes, and Fig. 5 is a similar view of one of the spacing-blocks. Fig. 6 is a view, partially in side elevation and partially in section, of a turbine both the rotating and the stationary members of which have blades or vanes that are fastened in position in accordance with my invention:

Fluid-pressure turbines of the Parsons type are provided with a number of annular sets of blades or vanes upon each of the turbine members, and as these blades or vanes are usually constructed as separate devices it is desirable to embody some means of anchoring them in position which will facilitate insertion and removal and at the same time insure a rigid connection between them and the supporting structure. Inasmuch as the blades or vanes are spaced apart in order to provide passages of the desired form and dimensions,

it is usual to provide these devices with laterally-projecting bases or to provide separate spacing-blocks. Either of these expedients may be utilized in my invention; but in order to simplify and cheapen construction I generally prefer to make the blades or vanes of uniform cross-section throughout and to employ separate spacing-blocks. This is the construction which I have illustrated in the drawings.

In Figs. 1, 2, and 3 I have shown a portion of the drum 1 of the turbine as provided with a circumferential groove 2, that is rectangular in cross-section and the width of which is equal to the width of the blades 3 and spacing-blocks 4 that are to be employed. It will be of course understood, as indicated in Fig. 6, that the casing or cylinder 5 of the turbine 6, as well as the drum 1, is provided with a plurality of annular grooves 2, the number and dimensions of which will depend upon the dimensions and type of turbine.

As indicated in the drawings, the inner side wall of the groove 2 is provided with an annular recess 7, that is semicircular in cross-section, and the corresponding sides or edges of the blades 3 and spacing-blocks 4 are respectively provided with recesses 8 and 9 of similar form in cross-section. A wire 10 of the proper size to fit the recess 7 is placed therein, and then the blades and spacing-blocks are alternately inserted and turned into operative position in the groove 2, such insertion being readily effected, since the width of the groove is materially greater than the thickness of either the blades or the spacing-blocks.

The specific means shown for locking the blades and spacing-blocks in position will probably be found as inexpensive and serviceable as any that could be employed; but it would be of course feasible to have the annular portion that fits into the notches 8 and 9 formed as an integral part of the casing-cylinder or the drum, as the case may be, instead of being inserted as a separate wire. It will also be understood that this annular projection, whether formed as a separate device

or as an integral part of the drum or cylinder, may be of different shape in cross-section from that illustrated. Whatever may be the specific form of this annular projection and whether it be integral with the drum or cylinder or whether it be a separate locking device it will serve to securely anchor the blades in position. Any desired addition to or modification of the locking device may be made in order to facilitate the insertion of the final vane or blade and spacing-block of a set. One means that may be utilized for this purpose is shown in the Hodgkinson patent, No. 672,838, of April 22, 1901; but it is obvious that this is only one of several devices that might be used.

I claim as my invention—

1. In a turbine, a blade-supporting member provided with an annular groove having an annular recess in one wall thereof, blades or vanes arranged within said groove and having notches that register with said recess, and an anchoring strip or wire lying partially within said recess and said notches.
2. In a turbine, a blade-supporting member provided with a parallel-walled annular groove, blades or vanes arranged in said groove, spacing-blocks arranged between the adjacent blades or vanes, and a removable anchoring strip or wire partially located in one wall of said groove and partially within the blades or vanes and spacing-blocks.
3. In a fluid-pressure turbine, a blade-sup-

porting member having annular grooves and annular recesses at corresponding sides, blades or vanes having the same width as said grooves and having notches, and locking-wires that fit into said recesses and said notches.

4. In a fluid-pressure turbine, a blade-supporting member having annular grooves and annular recesses opening into the sides of said grooves, blades and spacing-blocks having the same width as said grooves and having side notches, and locking-wires that fit into said notches and said annular recesses.

5. In a fluid-pressure turbine, a blade-supporting member having annular grooves, blades or vanes and spacing-blocks of the same width as said grooves and fitted therein, and locking-rings located partially in notches in the blades and spacing-blocks and partially in annular recesses at the sides of the grooves.

6. A fluid-pressure turbine having annular grooves in its blade-supporting members, blades and spacing-blocks fitted into said grooves, and locking-rings located partially in notches in said blades and spacing-blocks and partially in the supporting members at the sides of the grooves.

In testimony whereof I have hereunto subscribed my name this 5th day of May, 1904.

HENRY L. BARTON.

Witnesses:

HARRY B. SMITH,
BIRNEY HINES.