No. 835,472. PATENTED NOV. 6, 1906.

M. ROTTER.

TURBINE.

APPLICATION FILED JULY 12, 1906.

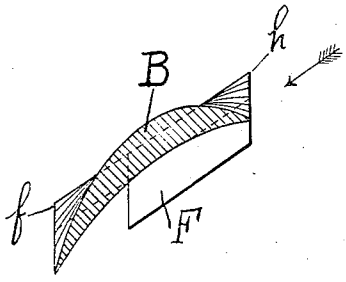



Fig. III.

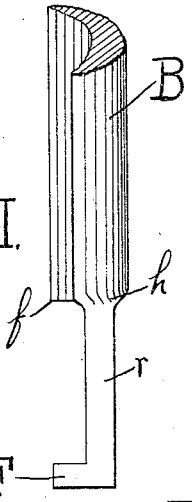



Fig. II.

Fig. I.

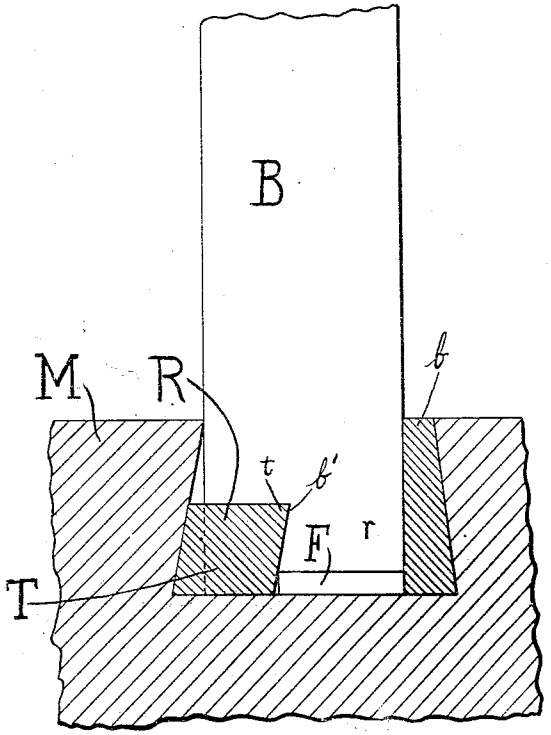



Fig. IV.

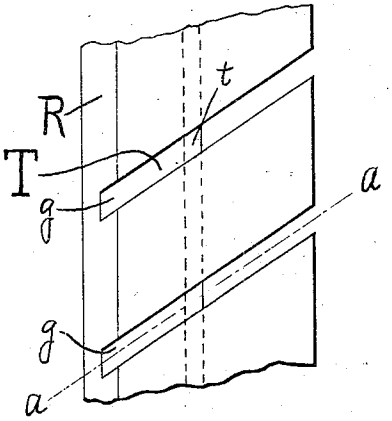
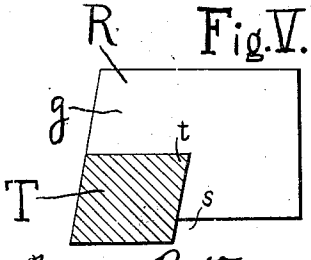



Fig. V.




WITNESSES:

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# UNITED STATES PATENT OFFICE.

MAX ROTTER, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO ALLIS-CHALMERS COMPANY, OF MILWAUKEE, WISCONSIN, A CORPORATION OF NEW JERSEY.

## TURBINE.

No. 835,472. Specification of Letters Patent. Patented Nov. 6, 1906.

Application filed July 12, 1906. Serial No. 325,746.

*To all whom it may concern:*

Be it known that I, MAX ROTTER, 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 Turbine, of which the following is a specification.

This invention relates to turbines, and more specifically to the type known as "elastic-fluid" turbines; and it comprises means for securing the blades to the blade-holding members.

In the accompanying drawings, which illustrate an embodiment of the invention and which are to be considered as a part of this specification and in which the same reference characters are used to designate the same elements in each of the several views, Figure 1 represents in section the blade-holding elements and a blade in its proper relation thereto. Fig. 2 is a fragmentary elevation of a blade as seen looking in the direction indicated by the arrow on Fig. 3. Fig. 3 is a plan view of a blade. Fig. 4 is a plan view of the retaining-ring, and Fig. 5 is a sectional view of the retaining member, taken on the line *a a* of Fig. 4.

The reference character M designates a blade-holding member, which is shown as provided with an undercut recess similar to an ordinary form of dovetailed slot.

Reference character R represents a blade-retaining member which is adapted to be seated in the recess of the blade-holding member. This blade-retaining member R is formed with a recess, as shown at *s*, on its lower surface, and on its upper surface is formed a plurality of slots *g g*, which slots are extended through one side of said member, so that they communicate with the recess, as clearly illustrated by Figs. 4 and 5.

Reference character B represents a blade which is provided with the root *r* and the offset or bent-over portion F. The blade is provided with shoulders *f h*, which are adapted to rest in one of the grooves *g* when the root of the blade is inserted in said groove with the offset or bent-over portion F hooked under said member and lying in the recessed portion thereof.

Reference character *b* represents a holding-strip, which is adapted to lock the blade B to the member R and retain the blade B and member R within the undercut recess of the blade-holding member M. While this holding-strip may be dispensed with it facilitates the assembling of the parts under certain conditions.

The blade-retaining member R is formed with its base and one side disposed at an acute angle to fit the undercut recess of the blade-holding member, and the grooves *g* and recess *s* are so disposed and formed that the solid portions T at the bottoms of the grooves *g* project to form a dovetail lock *t* for the blades, which are correspondingly recessed at *b'*, as clearly shown by Figs. 1 and 5 of the drawings. By this construction the blades may be readily and securely fastened to the blade-holding member.

What I claim is—

1. The combination with a blade-holding member provided with a recess of a blade-retaining member seated in said recess, said blade-retaining member being provided with a recess and a locking portion and a blade provided with an offset portion and a recess to coact with the recess and locking portion of said retaining member respectively.

2. The combination with a blade-holding member provided with a recess of a blade-retaining member seated in said recess, said blade-retaining member being provided with a recess and a locking portion and a blade provided with an offset portion and a recess to coact with the recess and locking portion of said retaining member respectively, and means for securing said blade and retaining member in the recess of said blade-holding member.

3. The combination with the blade-holding member provided with a recess of the blade-retaining member R recessed at *s* and provided with slots *g*, and the blade B provided with the offset portion F.

4. The combination with the blade-holding member provided with a recess of the blade-retaining member R recessed at *s* and provided with slots *g*, the blade B provided with the offset portion F, and means for securing said blade and blade-retaining member in the recess of said blade-holding member.

5. The combination with the blade-hold-

ing member provided with a recess of a blade-retaining member seated in said recess, said blade-retaining member being provided with a groove on its outer surface and also being recessed, a blade adapted to engage with the groove and provided with an offset portion to engage with the recessed portion of said blade-retaining member respectively, and means to secure said blade and blade-retaining member in the recess of said blade-holding member.

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

MAX ROTTER.

Witnesses:
FRANK E. DENNETT,
G. F. DE WEIN.